

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

**Affiliated to Bharathidasan University
Nationally Accredited (3rd Cycle) with 'A' grade by NAAC
ISO 9001:2015 Certified
Annamalainagar
Tiruchirapalli-620018**



Minutes of the Seventh Meeting of the Academic Council

Date : 19.11.2022
Venue : Trust Meeting Hall

Time: 10.30 a.m.

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SEVENTH MEETING OF THE ACADEMIC COUNCIL

Date : 19.11.2022
Venue: Trust Meeting Hall

Time: 10.30 A.M.

MINUTES

WELCOME AND INTRODUCTORY REMARKS OF THE CHAIRMAN

The Chairman of the Academic Council Dr. V. Sujatha welcomed the gathering to the VII Meeting of the Academic Council

CONFIRMATION OF THE MINUTES OF THE LAST MEETING HELD ON 16.06.2022

The Member Secretary Dr. Sinthu Janita Prakash read the minutes of the VI Meeting of the Academic Council comprising of 23 Resolutions- (Resolution 06/01 to Resolution 06/23) pertaining to the regulations of (2022 – 2023), implementation of LOCF as per the UGC Guidelines and the approval of PEO, PO & PSO, Programme Structure of Arts & Science programmes in Undergraduate and Postgraduate levels , introduction of Value Added & Extra Credit Courses, I Semester Syllabus of all undergraduate and postgraduate programmes of 2022-2023 batch, amendment in the curriculum in the previous semesters, ratification in the retention of the answer scripts and declaration of examination results were confirmed.

RESOLUTION 07/22/01

To consider and approve the Programme Structure of Arts & Science programmes in Undergraduate and Postgraduate levels for the Academic year (2022-2023) and onwards.

*CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to give equal weightage of credits for all courses.*

*The total **minimum** credits for completing UG Programme is 140 credits and for PG Programme is 90.*

He also suggested to include Communicative English & Professional English in the curriculum as per the circular received from TANSCH.

***Dr D I George Amalarethnam**, Academic Expert suggested to give only one course as Skill Enhancement Course without any electives.*

Considered and approved the Programme Structure of Arts & Science programmes in Undergraduate and Postgraduate levels for the Academic year (2022-2023) and onwards as given in Annexure A.

RESOLUTION NO.07/22/02

To consider and approve the

- a. Syllabus of Part I Language - Tamil for Semesters II for all Under Graduate Programmes for (2022-2023) batch and onwards
- b. Ratification of Semester I, Part I Language Course-I for 2023-2024 batch and onwards for all Undergraduate Programmes
- c. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.A Tamil for (2022-2023) batch and onwards
- d. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.A Tamil for (2022-2023) batch and onwards
- e. The inclusion of Project Work for B.A Tamil of (2021-2022) batch.

Considered and approved the

- a. *Syllabus of Part I Language - Tamil for Semesters II for all Under Graduate Programmes for (2022-2023) batch and onwards*
- b. *Ratification of Semester I, Part I Language Course-I for 2023-2024 batch and onwards for all Undergraduate Programmes*
- c. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.A Tamil for (2022-2023) batch and onwards*
- d. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.A Tamil for (2022-2023) batch and onwards*
- e. *The inclusion of Project Work – 21UTA6PW by combining the Core Courses 19UTA6CC14- Sanga Illakkiam-I and 19UTA6CC15-Sanga Illakkiam-II as 21UTA6CC14-Sanga Illakkiam for B.A Tamil of (2021-2022) batch.*

*as recommended by the Board of Studies in Languages and moved by the Chairman **Dr S Ramalakshmi** in the meeting and the same be approved as given in **Annexure B***

RESOLUTION NO.07/22/03

To consider and approve the Part I Other Languages for Semesters II to IV for all Under Graduate Programmes of 2022-2023 batch and onwards for

- a. Hindi
- b. Sanskrit
- c. French

*It is resolved to follow II to IV semesters syllabi of Hindi for 2022-2023 batch as recommended by the Board of Studies in Other Languages-Hindi and moved by the Chairman **Dr R Vijayalakshmi** in the meeting and the same be approved as given in **Annexure C***

*It is resolved to follow II to IV semesters syllabi of French for 2022-2023 batch and onwards as recommended by the Board of Studies in Other Languages-French and moved by **Ms Manju** in the meeting and the same be approved as given in **Annexure C***

*It is resolved to follow I to IV semesters syllabi of Sanskrit for 2022-2023 batch and onwards as recommended by the Board of Studies in Other Languages-Sanskrit and moved by **Dr Sathyakannamani** in the meeting and the same be approved as given in **Annexure C***

RESOLUTION NO.07/22/04

To consider and approve

- a. Syllabus of Part II- English for Semester II for all Under Graduate Programmes for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.A English for (2022-2023) batch and onwards
- c. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.A English for (2022-2023) batch and onwards
- d. The introduction of Internship as Extra Credit Course for B.A English of (2021-2022) batch.

Resolved to approve

- a. *Syllabus of Part II- English for Semester II for all Under Graduate Programmes for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.A English for (2022-2023) batch and onwards*
- c. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.A English for (2022-2023) batch and onwards*
- d. *The introduction of Internship as Extra Credit Course for B.A English of (2021-2022) batch.*

*as recommended by the Board of Studies in English and moved by the UG Chairman **Dr S Jayashree Agarwal** & PG Chairman **Dr P Urmila** in the meeting and the same be approved as given in **Annexure D***

RESOLUTION NO.07/22/05

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of

B.S.W for (2022-2023) batch and onwards

b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.S.W for (2022-2023) batch and onwards

c. Ratification of the evaluation pattern of 22UGVE Jeevan Kaushal-Universal Human Values-Examination pattern for (2022-2023) batch and onwards

Dr. Kalidasan, University Nominee gave the suggestion to include online statistical packages for the Core Course IV- Social Work Research and Social Statics - 22PSW2CC4.

CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to teach the students how to interpret the results obtained from statistical tools.

Prof Senthilnathan, Academic Expert suggested to rename DSE-III- Computer Skills for Social Work 22PSW3DSE3B as Digital Literacy for Social Workers

Considered and approved

a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.S.W for (2022-2023) batch and onwards*

b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.S.W for (2022-2023) batch and onwards*

c. *Ratification of the evaluation pattern of 22UGVE Jeevan Kaushal-Universal Human Values-Examination pattern for (2022-2023) batch and onwards*

*as recommended by the Board of Studies in Social Work and moved by the Head of the Department **Dr G Mettilda Bhuvaneshwari** in the meeting and the same be approved as given in **Annexure E***

RESOLUTION 07/22/06

To consider and approve the Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BBA for (2022-2023) batch and onwards

*Resolved to approve the Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BBA for (2022-2023) batch and onwards as recommended by the Board of Studies in Business Administration and moved by the Chairman **Dr J Tamil Selvi** in the meeting and the same be approved as given in **Annexure F***

RESOLUTION 07/22/07

To consider and approve

a. The Programme Structure, the ratification of the I Semester Syllabus and

- the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Com for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.Com(CA) for (2022-2023) batch and onwards
 - c. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.Com for (2022-2023) batch and onwards

Resolved to approve

- d. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.Com for (2022-2023) batch and onwards*
- e. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B.Com(CA) for (2022-2023) batch and onwards*
- f. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M.Com for (2022-2023) batch and onwards*

*as recommended by the Board of Studies in Commerce and moved by the Chairman **Dr N Savithri** in the meeting and the same be approved as given in **Annexure G***

RESOLUTION 07/22/08

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Mathematics for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Mathematics for (2022-2023) batch and onwards
- c. The Syllabus of Core Course- VI- Business Analytics 22PCO2CC6 offered for II M. Com for (2022-2023) batch and onwards
- d. The ratification of Core Course- I- Mathematical Foundation for Computer Science - 23PCS1CC1 offered for I M. Sc Computer Science for (2023-2024) batch and onwards
- e. The Syllabus of Allied Course-III for B. Sc Physics-22UPH2AC3, B. Sc Chemistry-22UCH2AC3A, BSc Computer Science/BCA/BSC Information Technology - 22UCS2AC3/ 22UCA2AC3/ 22UIT2AC3, Allied Course-II-22UCG2AC2 & Allied Course-III - 22UCG2AC3 of BSc Computer Science with Cognitive Systems for (2022-2023) batch and onwards

Resolved to approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Mathematics for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Mathematics for (2022-2023) batch and onwards*
- c. *The Syllabus of Core Course- VI- Business Analytics 22PCO2CC6 offered for II M. Com for (2022-2023) batch and onwards*
- d. *The ratification of Core Course- I- Mathematical Foundation for Computer Science - 23PCS1CC1 offered for I M. Sc Computer Science for (2023-2024) batch and onwards*
- e. *The Syllabus of Allied Course-III for B. Sc Physics-22UPH2AC3, B. Sc Chemistry-22UCH2AC3A, BSc Computer Science/BCA/BSC Information Technology - 22UCS2AC3/ 22UCA2AC3/ 22UIT2AC3, Allied Course-II- 22UCG2AC2 & Allied Course-III - 22UCG2AC3 of BSc Computer Science with Cognitive Systems for (2022-2023) batch and onwards*

*as recommended by the Board of Studies in Mathematics and moved by the Chairman **Dr S Premalatha** in the meeting and the same be approved as given in **Annexure H***

RESOLUTION NO.07/22/09

To consider and approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Physics for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Physics for (2022-2023) batch and onwards*

Considered and approved

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Physics for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Physics for (2022-2023) batch and onwards*

*as moved by the Chairman **Dr G Maheswari** in the meeting and the same be approved as given in **Annexure I***

RESOLUTION NO.07/22/10

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Chemistry for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Chemistry for (2022-2023) batch and onwards
- c. Ratification of Core Practical VI - Gravimetric Analysis and Analytical Techniques 19UCH6CC6P as Gravimetric Analysis and Physical Parameters 20UCH6CC6P in Semester VI of 2020-2021 batch
- a. Ratification of MBE-II -Nuclear and Industrial Chemistry 19UCH6MBE2A as Analytical Techniques Practical 20UCH6MBE2AP and Basics of Nanoscience and Nanotechnology 19UCH6MBE2B as Analysis of Herbal Medicine Practical 20UCH6MBE2BP in Semester VI of 2020-2021 batch

University Nominee **Dr. Muruganandam** suggested to have the Allied II Courses Algebra, Analytical Geometry of 3D and Trigonometry (22UCH1AC2A) / Biochemistry Practical (22UCH1AC2BP) in the same pattern (both either as theory or Practical)

CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to change the title of VI Semester DSE-II Course (22UCH6DSE2CP) - Analysis of Herbal Medicine (P) as Analysis of Herbal Products (P)

University Nominee **Dr. Sivasudha** suggested to change the title of Semester II, Core Practical (22UCH2CC2P) - Analysis of Industrial Importance (P) as Preparation and Analysis of Industrial Compounds.

Resolved to approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Chemistry for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Chemistry for (2022-2023) batch and onwards*
- c. *Ratification of Core Practical VI - Gravimetric Analysis and Analytical Techniques 19UCH6CC6P as Gravimetric Analysis and Physical Parameters 20UCH6CC6P in Semester VI of 2020-2021 batch*
- d. *Ratification of MBE-II -Nuclear and Industrial Chemistry 19UCH6MBE2A as Analytical Techniques Practical 20UCH6MBE2AP and Basics of Nanoscience and Nanotechnology 19UCH6MBE2B as Analysis of Herbal Medicine Practical 20UCH6MBE2BP in Semester VI of 2020-2021 batch*

*as recommended by the Board of Studies in Chemistry and moved by the Chairman **Dr P. Pungayee @ Amirtham** in the meeting and the same be approved as given in **Annexure J***

RESOLUTION NO.07/22/11

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Computer Science for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Computer Science for (2022-2023) batch and onwards
- c. The Syllabus of Second Allied Course-III for B. Sc Mathematics-21UMA4AC4, for (2021-2022) batch and onwards

Considered and approved

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Computer Science for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of M. Sc Computer Science for (2022-2023) batch and onwards*
- c. *The Syllabus of Second Allied Course-III for B. Sc Mathematics-21UMA4AC4, for (2021-2022) batch and onwards*

*as recommended by the Board of Studies in Computer Science and moved by the Chairman **Dr Sinthu Janita Prakash** in the meeting and the same be approved as given in **Annexure K**.*

RESOLUTION NO.07/22/12

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BCA for (2022-2023) batch and onwards
- b. The ratification of the I Semester Allied Courses Syllabus and the proposed Syllabus of Allied Course for Semester II of B. Com (CA) for (2022-2023) batch and onwards
- c. The Syllabus of Semesters V & VI of BCA for (2021-2022) batch and onwards

Resolved to approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BCA for (2022-2023) batch and onwards*
- b. *The ratification of the I Semester Allied Courses Syllabus and the proposed Syllabus of Allied Course for Semester II of B. Com (CA) for (2022-2023) batch and onwards*
- c. *The Syllabus of Semesters V & VI of BCA for (2021-2022) batch and onwards*
*as recommended by the Board of Studies in Computer Applications and moved by the Chairman **Dr Merlin Packiam** in the meeting and the same be approved as given in **Annexure L**.*

RESOLUTION NO.07/22/13

To consider and approve the Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BSc Information Technology for (2022-2023) batch and onwards

***Dr D I George Amalarethinam**, Academic Expert suggested to rename the Core Practical-II as Java Programming Practical*

*Considered and approved the Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BSc Information Technology for (2022-2023) batch and onwards as recommended by the Board of Studies in Information Technology and moved by the Chairman **Dr M Parveen** in the meeting and the same be approved as given in **Annexure M***

RESOLUTION NO.07/22/14

To consider and approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Microbiology for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Semester II of M. Sc Microbiology for (2022-2023) batch and onwards*
- c. *The introduction of Project Work as Extra Credit Course for B. Sc Microbiology of (2021-2022) batch.*
- d. *The syllabus of Ability Enhancement Compulsory Course-II Environmental Studies for all Undergraduate Programmes of (2022-2023) batch and onwards*

*CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to change the Core Choice Course - 22PMB3CCC2B - Human Anatomy and Physiology as Microbial Gene Technology*

Considered and approved

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Microbiology for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Semester II of M. Sc Microbiology for (2022-2023) batch and onwards*
- c. *The introduction of Project Work as Extra Credit Course for B. Sc Microbiology of (2021-2022) batch.*
- d. *The syllabus of Ability Enhancement Compulsory Course-II Environmental Studies for all Undergraduate Programmes of (2022-2023) batch and onwards*

*as recommended by the Board of Studies in Microbiology and moved by the Chairman **Dr B Thamilmaraiselvi** in the meeting and the same be approved as given in **Annexure N***

RESOLUTION NO.07/22/15

To consider and approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Biotechnology for (2022-2023) batch and onwards*
- b. *Ratification of SBE-III Lab in Plant Tissue Culture(19UBTSBE3P) as Lab in Plant Tissue Culture and Environmental Biotechnology(21UBTSBE3P) in the fifth semester*
- c. *The introduction of Internship as Extra Credit Course for B. Sc Biotechnology of (2021-2022) batch and onwards*

*CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to convert the Core Course Bioinstrumentation (22UBT2CC3) \ as Allied or Elective Course for the batch 2023 - 2024 and onwards.*

*University Nominee **Dr. Sivasudha** and CCCD Director & Special Invitee **Dr Rajesh Kannan** suggested to change the Elective Course- Agricultural Biotechnology (22UBT6DSE2C) since the programme structure is having the Core Course Plant Biotechnology (22UBT5CC6).*

Resolved to approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of B. Sc Biotechnology for (2022-2023) batch and onwards*
- b. *Ratification of SBE-III Lab in Plant Tissue Culture(19UBT5SBE3P) as Lab in Plant Tissue Culture and Environmental Biotechnology(21UBT5SBE3P) in the fifth semester*
- c. *The introduction of Internship as Extra Credit Course for B. Sc*

Biotechnology of (2021-2022) batch and onwards

*as recommended by the Board of Studies in Biotechnology and moved by the Chairman **Dr R Rameswari** in the meeting and the same be approved as given in **Annexure O***

RESOLUTION NO.07/22/16

To consider and approve

- a. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BSc Nutrition & Dietetics for (2022-2023) batch and onwards
- b. The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of MSc Food Service Management & Dietetics for (2022-2023) batch and onwards

To consider and approve

- a. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Part III Core and Allied Courses for Semester II of BSc Nutrition & Dietetics for (2022-2023) batch and onwards*
- b. *The Programme Structure, the ratification of the I Semester Syllabus and the proposed Syllabus of Core, Core Choice and Discipline Specific Elective Courses of Semester II of MSc Food Service Management & Dietetics for (2022-2023) batch and onwards*

*as recommended by the Board of Studies in Food Service Management and Dietetics and moved by the Chairman **Ms B Thanuja** in the meeting and the same be approved as given in **Annexure P***

RESOLUTION 07/22/17

To approve 50 % Internal Evaluation for Part I Language, Part II English Language and 100 % evaluation for Part IV Non Major Electives and Skill Based Electives.

Resolved to have 50% internal and 50 % external evaluations for Part I- Language, Part II English Language and Part IV- Non Major Electives / Generic Electives and Skill Based Electives / Skill Enhancement Course in the forthcoming examinations.

RESOLUTION 07/22/18

To approve the introduction of Cyber Security Course in UG & PG Levels as recommended by UGC for (2022-2023) batch and onwards

*Resolved to approve the introduction of UGC recommended Course- **Cyber Security** with 5hrs (3 hrs theory + 2 hrs practical) and 4 credits as a Core Course in Undergraduate level and as a Core Choice Course in Post Graduate Level for (2022-2023) batch and onwards*

RESOLUTION 07/22/19

To approve the conversion of Core Course, Competitive Examination in the postgraduate programme as a Core Choice Course or Discipline Specific Elective Course *for (2022-2023) batch and onwards*

Approved the conversion of Core Course - Competitive Examination in the postgraduate programme as a Discipline Specific Elective Course-III for (2022-2023) batch and onwards

RESOLUTION 07/22/20

To consider and approve to make use of the Question Bank for External Examination

- *Blooms taxonomy to be followed for question paper setting*
- *Every question in the bank to be marked with K and CO levels*
- *Question Bank to be validated by external subject experts*

Resolved to make use of the Question Bank for External Examination in the future.

-sd-

Dr V Sujatha


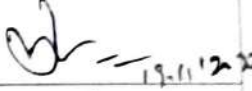






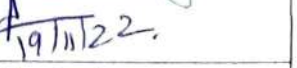
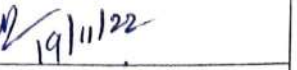
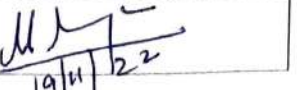
(Chairman of the Academic Council & The Principal)

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THE MINUTES OF THE SEVENTH MEETING OF THE ACADEMIC COUNCIL

The seventh meeting of the Academic Council was held on 19th November 2022, Thursday at 10.30 a.m. in the Trust Meeting Hall under the Chairmanship of Dr. V. Sujatha, Principal. The following members were present.

S.No	Members	Designation	Signature
Chairman			
1	Dr. V. Sujatha	Principal, Cauvery College for Women(A)	 19.11.22
University Nominees			
2	Dr. P. Muruganandam	Professor & Head, Dept. of Physics, Bharathidasan University, Trichy.	 19.11.22
3	Dr. T. Sivasudha	Professor Dept. of Environmental Biotechnology, Bharathidasan University, Trichy.	 19/11/2022
4	Dr. R. Kalidasan	Professor & Head, Dept. of Physical Education & Yoga, Bharathidasan University, Trichy.	 19/11/2022
Academic Experts			
5	Dr. S. Senthilnathan	Director (FAC), UGC-HRDC, Department of Educational Technology, Bharathidasan University, Trichy.	 19/11/2022
6	Dr. K. Karunakaran	Chief Executive Officer, Hindustan Educational Institutions, Coimbatore.	Attended Online
7	Dr. D. I. George Amalarethinam	Bursar, Director (MCA), Associate Professor of Computer Science, Jamal Mohamed College (A), Trichy.	
Industry Expert			
8	Derrick Alex	AGM Operations, VDart Technologies. Pvt.Ltd.	
Special Invitees			
9	Dr V. Rajesh Kannan	Director Council for College & Curriculum Department Bharathidasan University, Trichy	
10	Dr. R. Vijayalakshmi	Hindi (Guest Lecturer)	 19/11/22.
11	Dr.C.R.SathyaKannamani	Sanskrit(Guest Lecturer)	 19/11/22
12	Ms.Manjula	French	 19/11/22

Internal Members**Heads of the Departments**

13	Dr. S. Ramalakshmi	Vice Principal & HoD of Tamil	<i>[Signature]</i> 19/11/22
14	Dr.P.Urmila	HoD of English(PG)	<i>[Signature]</i> 19/11/22
15	Dr. S. Jayashree Agarwal	HoD of English(UG)	<i>[Signature]</i> 19/11/22
16	Dr. S. Metilda Buvaneswari	HoD of Social Work	<i>[Signature]</i> 19/11/2022
17	Dr. J. Tamil Selvi	HoD of BBA	<i>[Signature]</i> 19/11/22
18	Dr. N. Savithri	Dean of Arts & HoD of Commerce	<i>[Signature]</i> 19/11/22
19	Dr. S. Premalatha	HoD of Mathematics	<i>[Signature]</i> 19/11/22
20	Dr. G. Maheswari	HoD of Physics	<i>[Signature]</i> 19/11/22
21	Dr. P. Pungayee @ Amirtham	HoD of Chemistry	<i>[Signature]</i> 19/11/22
22	Dr. R. Merlin Packiam	HoD of Computer Applications	<i>[Signature]</i> 19/11/22
23	Dr. M. Parveen	HoD of Information Technology	<i>[Signature]</i> 19/11/2022
24	Dr. B. Tamilmaraiselvi	HoD of Microbiology	<i>[Signature]</i> 19/11/22
25	Dr. R. Rameshwari	HoD of Biotechnology	<i>[Signature]</i> 19/11/2022
26	Ms. B. Thanuja	HoD of Food Service Management & Dietetics	<i>[Signature]</i> 19/11/2022

Senior Faculty in the College by Rotation

27	Dr. S. Shameem	Vice Principal	<i>[Signature]</i>
28	Dr.G.Kanaga	Dean of Alumni Relations	<i>[Signature]</i> 19/11/2022
29	Dr.V.Ramya	Controller of Examinations	<i>[Signature]</i> 19/11/2022
30	Dr.N.Sivapriya	Deputy Controller of Examinations	<i>[Signature]</i> 19/11/22
31	Dr B Baby Shakila	Director of Physical Education	<i>[Signature]</i> 19/11/22
32	Ms. N. Girubagari	Head in Charge, Computer Science	<i>[Signature]</i> 19/11/22
33	Dr.H.Krishnaveni	Course Coordinator, B.Sc Computer Science with Cognitive Systems	<i>[Signature]</i> 19/11/2022

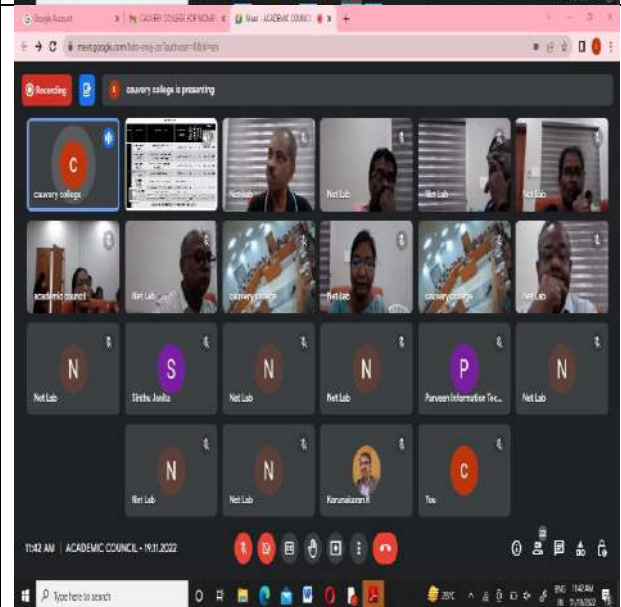
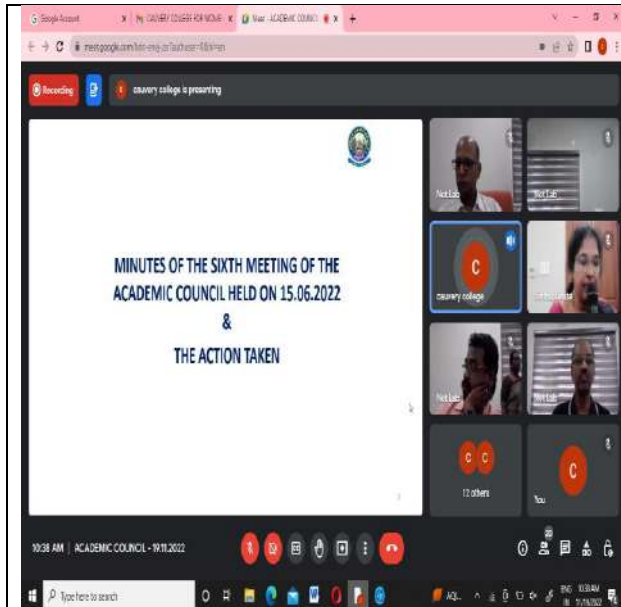
Member Secretary

34	Dr. V. Sinthu Janita Prakash	Dean of Science, IQAC Coordinator, HoD of Computer Science	<i>[Signature]</i> 19/11/22
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THE FOLLOWING MEMBERS HAD EXPRESSED THEIR INABILITY TO ATTEND THE MEETING DUE TO THEIR PRE-OCCUPATION.

Student Representatives

1	Ms.K.Nikitha	I M.Sc FSM & D
2	Ms.N.Monika	III B.Sc Che



Zoom Meeting: countrycollegedpawar

SEMESTER - IV

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Zoom Meeting: countrycollegedpawar

SEMESTER - I

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Zoom Meeting: countrycollegedpawar

SEMESTER - IV

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12:58 PM | ACADEMIC COUNCIL - 16/11/2022

Zoom Meeting: countrycollegedpawar

BOARD OF STUDIES MEETING

1:04 PM | ACADEMIC COUNCIL - 16/11/2022

Zoom Meeting: countrycollegedpawar

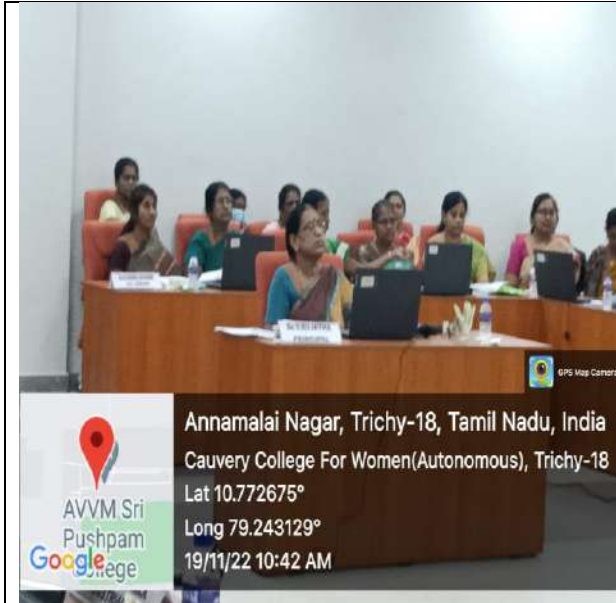
1:24 PM | ACADEMIC COUNCIL - 16/11/2022

Zoom Meeting: countrycollegedpawar

Vote of Thanks

Dr S Ramalakshmi
Vice Principal

1:31 PM | ACADEMIC COUNCIL - 16/11/2022




**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 10:42 AM



**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 12:44 PM



**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 12:24 PM




**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 11:56 AM



**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 11:13 AM



**Annamalai Nagar, Trichy-18, Tamil Nadu, India**
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 11:40 AM



Annamalai Nagar, Trichy-18, Tamil Nadu, India
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 10:39 AM



Annamalai Nagar, Trichy-18, Tamil Nadu, India
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 10:37 AM



Annamalai Nagar, Trichy-18, Tamil Nadu, India
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 12:30 PM



Annamalai Nagar, Trichy-18, Tamil Nadu, India
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 11:48 AM



Annamalai Nagar, Trichy-18, Tamil Nadu, India
Cauvery College For Women(Autonomous), Trichy-18
Lat 10.772675°
Long 79.243129°
19/11/22 11:30 AM



Annexure :A
CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG & RESEARCH DEPARTMENT OF _____

B.A /B.SW/BBA/B.Com _____

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)			6	3	3	25	75	100
	II	English Language Course-I(ELC)			6	3	3	25	75	100
	III	Core Course – I(CC)					3	25	75	100
Core Course- II (CC)							3	25	75	100
			First Allied Course- I (AC)			4	3	3	25	75
IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100	
Total					30	23				600
II	I	Language Course-II(LC)			5	3	3	25	75	100
	II	English Language Course-II(ELC)			6	3	3	25	75	100
	III	Core Course – III (CC)					3	25	75	100
			Core Course- IV (CC)					3	25	75
		First Allied Course – II (AC)			4	3	3	25	75	100
Ability Enhancement Compulsory Course-II (AECC)		Environmental Studies	22UGEVS	2	2	-	100	-	100	
Extra Credit Course		SWAYAM	As per UGC Recommendation							
Total					30	23				600
III	I	Language Course-III (LC)			5	3	3	25	75	100
	II	English Language Course-III(ELC)			6	3	3	25	75	100
	III	Core Course– V(CC)					3	25	75	100
		Core Course - VI(CC)					3	25	75	100
		Second Allied Course-I (AC)			4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
Generic Elective Course- I (GEC)			22UXX3GEC1	2	2	3	25	75	100	
		Basic Tamil - I	22ULC3BT1							
	Special Tamil - I	22ULC3ST1								
Extra Credit Course		SWAYAM	As per UGC Recommendation							
Total					30	23				700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)			6	3	3	25	75	100		
	II	English Language Course – IV (ELC)			6	3	3	25	75	100		
	III	Core Course – VII(CC)					3	25	75	100		
			Core Course – VIII(CC)					3	25	75	100	
				Second Allied Course- II (AC)			4	3	3	25	75	100
	IV	Generic Elective Course- II (GEC)	Internship	22UXX4INT	-	2	-	-	-	100		
			Basic Tamil - II	22UXX4GEC2								
22ULC4BT2				2	2	3	25	75	100			
Special Tamil -II			22ULC4ST2									
Skill Enhancement Course – I (SEC)		22UXX4SEC1P	2	2	3	40	60	100				
Extra Credit Course		SWAYAM	As per UGC Recommendation									
Total				30	25				800			
V	III	Core Course – IX(CC)					3	25	75	100		
			Core Course – X(CC)					3	25	75	100	
				Core Course - XI(CC)					3	25	75	100
					Core Course – XII(CC)					3	25	75
	Discipline Specific Elective – I (DSE)	A.	22UXX5DSE1A			4	3	25	75	100		
		B.	22UXX5DSE1B									
		C.	22UXX5DSE1C									
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100		
		Skill Enhancement Course – II (SEC)		22UXX5SEC2AP	2	2	3	40	60	100		
	Extra Credit Course		SWAYAM	As per UGC Recommendation								
Total				30	29				700			
VI	III	Core Course – XIII(CC)					3	25	75	100		
			Core Course – XIV(CC)					3	25	75	100	
				Core Course – XV(CC)					3	25	75	100
					Core Course – XVI(CC)	Cyber Security	22UGCS	5	4	3	25	75
	Discipline Specific Elective – II (DSE)	A.	22UXX6DSE2A			4	3	25	75	100		
		B.	22UXX6DSE2B									
		C.	22UXX6DSE2C									
	V	Project	Project Work	22UXX6PW	5	3	-	-	100	100		
				Ability Enhancement Compulsory Course-V(AECC)	Gender Studies	22UGGS	1	1	-	100	-	100
					Extension activity	22UGEA	-	1	-	-	-	-
Total				30	27				700			
Grand Total				180	150				4100			

Courses & Credits for UG Programmes(Arts)

Part	Course	No of Courses	Credits	Total
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	16	84	109
	Project Work	1	3	
	Internship	1	2	
	First Allied	2	6	
	Second Allied	2	6	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV-Professional Skills	1	2	
V	AECC-V Gender Studies	1	1	02
	Extension Activities	--	1	
		41		150



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG & RESEARCH DEPARTMENT OF _____

BCA/ B.Sc

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)			6	3	3	25	75	100
	II	English Language Course-I(ELC)			6	3	3	25	75	100
	III	Core Course – I(CC)				3	3	25	75	100
		Core Practical - I (CP)				3	3	40	60	100
		First Allied Course- I (AC)			4	3	2	25	75	100
		First Allied Course- II (AC)			4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100
	Total					30	22			
II	I	Language Course-II(LC)			5	3	3	25	75	100
	II	English Language Course-II(ELC)			6	3	3	25	75	100
	III	Core Course – II (CC)				3	3	25	75	100
		Core Practical - II (CP)				3	3	25	75	100
		Core Course-III(CC)/ Core Practical -III (CP)				3	3			100
		First Allied Course – III (AC)				3	3	25	75	100
		Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total					30	23				800
III	I	Language Course-III (LC)			5	3	3	25	75	100
	II	English Language Course-III(ELC)			6	3	3	25	75	100
	III	Core Course– III(CC)					3	25	75	100
		Core Practical - IV(CP)					3	40	60	100
		Second Allied Course-I (AC)				3	3	25	75	100
		Second Allied Course- II (AP)				3	3	25	75	100
	IV	Generic Elective Course- I (GEC)		22UXX3GEC1	2	2	3	25	75	100
			Basic Tamil - I	22ULC3BT1						
Special Tamil - I			22ULC3ST1							
Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total					30	23				700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)			6	3	3	25	75	100	
	II	English Language Course – IV (ELC)			6	3	3	25	75	100	
	III	Core Course – IV(CC)					3	25	75	100	
		Core Practical - V(CP)					3	40	60	100	
		Second Allied Course- III (AC)				3	3			100	
		Internship	Internship	22UXX4INT	-	2	-	-	-	100	
	IV	Generic Elective Course- II (GEC)		22UXX4GEC2							
			Basic Tamil - II	22ULC4BT2	2	2	3	25	75	100	
		Special Tamil - II	22ULC4ST2								
		Skill Enhancement Course – I (SEC)	Practical	22UXX4SEC1P	2	2	3	40	60	100	
Extra Credit Course		SWAYAM		As per UGC Recommendation							
Total				30	25					800	
V	III	Core Course – V(CC)					3	25	75	100	
		Core Practical – VI(CP)					3	40	60	100	
		Core Course - VI(CC)					3	25	75	100	
		Core Course – VII(CC)					3	25	75	100	
	Discipline Specific Elective – I (DSE)	A.	22UXX5DSE1A								
		B.	22UXX5DSE1B		4	3	25	75	100		
		C.	22UXX5DSE1C								
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal -Professional Skills	22UGPS	2	2	-	100	-	100	
		Skill Enhancement Course – II (SEC)	Practical	22UXX5SEC2P	2	2	3	40	60	100	
	Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total				30	29					700	
VI	III	Core Course – VIII(CC)					3	25	75	100	
		Core Course – VII(CC)					3	25	75	100	
		Core Course – VIII(CC)	Cyber Security	22UGCS	5	4	3	25	75	100	
		Core Practical – IX(CP)			3		3	40	60	100	
	Discipline Specific Elective – II (DSE)	A.	22UXX6DSE2A								
		B.	22UXX6DSE2B		4	3	25	75	100		
		C.	22UXX6DSE2C								
		Project	Project Work	22UXX6PW	5	4	-	-	100	100	
	V	Ability Enhancement Compulsory Course-V(AECC)	Gender Studies	22UGGS	1	1	-	100	-	100	
		Extension activity		22UGEA	-	1	-	-	-	-	
Total				30	28					700	
Grand Total				180	150					4400	

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	AECC-V Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG & RESEARCH DEPARTMENT OF _____

M.A/ M.Com/ M. Sc _____

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)				5	3			100
	Core Course – II (CC)				5	3			100
	Core Course –III (CC)				5	3			100
	Core Course - IV (CC)				5	3			100
	Discipline Specific Elective Course-I (DSE)	A.	22PXX1DSE1A	6	3	3			
		B.	22PXX1DSE1B						
		C.	22PXX1DSE1C						
Total				30	22				500

15 Days INTERNSHIP during Semester Holidays

II	Core Course– V (CC)				5	3			100
	Core Course –VI (CC)				5	3			100
	Core Course - VII (CC)				5	3			100
	Core Choice Course– I (CCC)	A.	22PXX2CCC1A	4	3				
		B.	22PXX2CCC1B						
		C.	22PXX2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A.	22PXX2DSE2A	3	3				
		B.	22PXX2DSE2B						
		C.	22PXX2DSE2C						
Internship	Internship	22PXX2INT	-	2	-	-	100	100	
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total			30	23					600

III	Core Course–VIII (CC)				5	3			100
	Core Course – IX (CC)				5	3			100
	Core Course- X (CC)				5	3			100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	
		B.	22PXX3CCC2B						
		C.	22PXX3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. Competitive Examination	22PXX3DSE3A	3	3	3	-	100	
		B.	22PXX3DSE3B						
		C.	22PXX3DSE3C						
Generic Elective Course - I (GEC)		22PXX3GEC1	3	2	3	25	75	100	
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total			30	23					600

IV	Core Course-XI (CC)				5	3			100
	Core Course - XII (CC)				5	3			100
	Core Choice Course– III (CCC)	A.	22PXX4CCC3A	4	3				
		B.	22PXX4CCC3B						
		C.	22PXX4CCC3C						
	Generic Elective Course- II (GEC)		22PXX4GEC2	3	2	3			100
	Project	Project Work	22PXX4PW	9	5	-	-	100	100
Total			30	22					500
Grand Total			120	92					2200

Courses & Credits for PG Arts Programmes

Sl. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course – (CC)	12	60	1200
2.	Core Choice Course– (CCC)	3	12	300
3.	Discipline Specific Elective- (DSE)	3	9	300
4.	Generic Elective Course - (GEC)	2	4	200
5.	Project	1	5	100
6.	Internship	1	2	100
	Total	22	92	2200



காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

(தேசியத் தர நிர்ணயக் குழுவின் மூன்றாம் சுற்றில் A தகுதி பெற்றது)
(ISO 9001:2015 தரச் சான்றிதழ் பெற்றது)

அண்ணாமலை நகர், திருச்சிராப்பள்ளி – 620018.

தமிழாய்வுத்துறை

பாடத்திட்டக் குழுக் கூட்டம் - நிகழ்ச்சி நிரல்

தமிழாய்வுத்துறையின் ஏழாவது பாடத்திட்டக் குழுக் கூட்டத்தின் நிகழ்ச்சி நிரல் :

1. பகுதி எண்.பா.தி.கு./07/01

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாட வரையறை மற்றும் பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

2. பகுதி எண்.பா.தி.கு./07/02

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

3. பகுதி எண்.பா.தி.கு./07/03

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறு பருவங்களுக்குமான பாட வரையறையை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

4. பகுதி எண்.பா.தி.கு./07/04

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

5. பகுதி எண்.பா.தி.கு./07/05

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

6. பகுதி எண்.பா.தி.கு./07/06

தமிழாய்வுத்துறையில் 2021-2022 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறாம் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

7. பகுதி எண்.பா.தி.கு./07/07

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான நான்கு பருவங்களுக்குமான பாட வரையறையை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

8. பகுதி எண்.பா.தி.கு./07/08

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

9. பகுதி எண்.பா.தி.கு./07/09

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

10. பகுதி எண்.பா.தி.கு./07/10

பாடத்திட்டம் உருவாக்கிய குழுவினரைப் பாராட்டுதல்



காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

(தேசியத் தர நிர்ணயக் குழுவின் மூன்றாம் சுற்றில் A தகுதி பெற்றது)
(ISO 9001:2015 தரச் சான்றிதழ் பெற்றது)

அண்ணாமலை நகர், திருச்சிராப்பள்ளி – 620018.

தமிழாய்வுத்துறை

தமிழாய்வுத்துறையின் ஏழாவது பாடத்திட்டக் குழுக் கூட்டத்தின்

நடவடிக்கைக் குறிப்புகள் :

நாள் : 20.10.2022

நேரம் : முற்பகல் 11.00 மணி

இடம் : E15

பாடத்திட்டக் குழுக் கூட்டத்தில் பங்கேற்ற உறுப்பினர்கள்

- | | |
|----------------------------------|---|
| 1. முனைவர் ச.இராமலட்சுமி | தலைவர்
பேராசிரியர் & துறைத்தலைவர் |
| 2. முனைவர் இரா.காமராசு | பாடத்திட்ட வல்லுநர்
தமிழ்ப் பல்கலைக்கழகம், தஞ்சாவூர். |
| 3. முனைவர் த.டான் ஸ்டோனி | பாடத்திட்ட வல்லுநர்
இலயோலா கல்லூரி, சென்னை. |
| 4. முனைவர் சு.இராசாராம் | பல்கலைக்கழகப் பிரதிநிதி
அழகப்பா பல்கலைக்கழகம், காரைக்குடி. |
| 5. முனைவர் கார்த்திகேஸ் பொன்னையா | பன்னாட்டுக் கல்வி வல்லுநர்
சுல்தான் இட்ரிஸ் கல்வியியல்
பல்கலைக்கழகம், மலேசியா |
| 6. திரு.க.விஜயன் | வேலைவாய்ப்பு மற்றும் தொழில்நுட்பப்
பிரதிநிதி
பத்திரிகையாளர் |
| 7. செல்வி ப.ராகவி | உறுப்பினர் – முன்னாள் மாணவி
ஆசிரியர் |
| 8. முனைவர் அ.இரா.கோமதி | உறுப்பினர் |

9. முனைவர் அ.யசோதா	உறுப்பினர்
10. முனைவர் ந.சுபா	உறுப்பினர்
11. முனைவர் வி.கவிதா	உறுப்பினர்
12. முனைவர் மு.ஜெயலெட்சுமி	உறுப்பினர்
13. முனைவர் தி.மணிமொழி	உறுப்பினர்
14. முனைவர் பா.கவிதா	உறுப்பினர்
15. முனைவர் மே.க.வசந்தி	உறுப்பினர்
16. முனைவர் இரா.வனிதா	உறுப்பினர்
17. முனைவர் வி.சத்யவதி	உறுப்பினர்
18. முனைவர் க.ராதிகா	உறுப்பினர்
19. முனைவர் மு.அனு	உறுப்பினர்
20. முனைவர் ப.சசிரேகா	உறுப்பினர்
21. முனைவர் மா.ஆசியாதாரா	உறுப்பினர்
22. முனைவர் ச.தீபா	உறுப்பினர்
23. முனைவர் க.அகல்யா	உறுப்பினர்
24. முனைவர் இர.கீர்த்தனா	உறுப்பினர்
25. முனைவர் செ.புனிதா	உறுப்பினர்
26. முனைவர் தெ.அகிலா	உறுப்பினர்
27. திருமதி பொ.அபிராமி	உறுப்பினர்
28. செல்வி மு.கோடீஸ்வரி	மாணவியர் பிரதிநிதி
29. செல்வி அ.பிரியங்கா	மாணவியர் பிரதிநிதி

பாடத்திட்டக் குழு நடவடிக்கைகள் :

1. பகுதி எண்.பா.தி.கு./07/01

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாட வரையறை மற்றும் பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்.

கலந்துரையாடலின்போது கூறப்பட்ட ஆலோசனைகள் :

- முதல் பருவப் பகுதி 1 தாள் 'இக்கால இலக்கியம்' என்று உள்ளதை 'இக்காலக் கவிதையும் சிறுகதையும்' என்று பெயர் மாற்றம் செய்யலாம்.
- நான்காம் பருவப் பகுதி 1 தாள் 'பண்டைய இலக்கியம்' என்று உள்ளதை 'பண்டைய இலக்கியமும் உரைநடையும்' என்று பெயர் மாற்றம் செய்யலாம்.

முதல் பருவத் தாள் பெயர் மாற்றம் 2023-2024 கல்வியாண்டிலிருந்து நடைமுறைப்படுத்தப்படுகிறது. நான்காம் பருவத் தாள் பெயர் மாற்றம் 2022-2023 கல்வியாண்டில் சேர்ந்த மாணவியரிடமிருந்து நடைமுறைப்படுத்தப்படுகிறது.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாட வரையறை மற்றும் பாடத்திட்டம் ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

பாடத்திட்டக் குழுவின் கூறிய ஆலோசனைகளைத் தேவைக்கேற்ப ஏற்றுக்கொள்ளலாம் என்று பரிந்துரைத்தனர்.

2. பகுதி எண்.பா.தி.கு./07/02

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவப் பாடத்திட்டங்களிலும் (22ULT1, 22ULT2, 22ULT3, 22ULT4) அலகு - 6 ஆக 'சுய கற்றல்' பகுதி சேர்க்கப்படுகிறது. இது புறத்தேர்வுக்கு உரியதல்ல.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் பகுதி 1 தமிழ் நான்கு பருவங்களுக்குமான பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

3. பகுதி எண்.பா.தி.கு./07/03

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறு பருவங்களுக்குமான பாட வரையறையை ஆலோசித்து

அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறு பருவங்களுக்குமான பாட வரையறை ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

4. பகுதி எண்.பா.தி.கு./07/04

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

பாடத்திட்டத்தில் செய்யப்பட்டுள்ள மாற்றங்கள் :

- நன்னூல் சொல்லதிகாரத்தில் பாட நூல் ஆறுமுக நாவலரின் காண்டிகையுரை என மாற்றம் செய்யப்பட்டுள்ளது. பெயரியல் இரு அலகுகளாக இடம்பெற்றுள்ளன. இடையிலும் உரியிலும் இணைக்கப்பட்டு ஒரு அலகாக்கப்பட்டுள்ளது. அலகு 6இல் சுய கற்றல் பகுதி அமைக்கப்பட்டுள்ளது.
- இக்கால இலக்கியம் II இல் அலகு 1, அலகு 2இல் சிறுகதைகளும், அலகு 3, அலகு 4இல் புதினங்களும் அலகு 5இல் நாடகமும் முற்றிலுமாக மாற்றி அமைக்கப்பட்டுள்ளன. அலகு 6இல் சுய கற்றல் பகுதி இடம்பெற்றுள்ளது.
- தமிழர் நுண்கலைகள் என்ற புதுப்பாடம் இணைக்கப்பட்டுள்ளது. இதற்காகப் புதுப்பாடத்திட்டம் அமைக்கப்பட்டுள்ளது.

கலந்துரையாடலின்போது கூறப்பட்ட ஆலோசனைகள் :

- நன்னூல் சொல்லதிகாரம் (காண்டிகையுரை) தாளில் சொல்லதிகாரம் முழுமையையும் கற்பித்தல் பகுதியில் இணைத்துவிட்டு சுய கற்றல் பகுதியில் அது தொடர்பான கருத்துக்களைக் கற்குமாறு அளிக்கலாம்.
- இக்கால இலக்கியம் II தாளில் பேராசிரியர்களின் படைப்புகளாக அளிக்காமல் பிற படைப்பாளர்களின் படைப்புகளைப் பாடங்களாக அளிக்கலாம்.

• இளங்கலைப் பாடத்திட்டத்தில் Cognitive level K4 வரை அளிக்கப்பட்டுள்ளது. K6 வரை அளிக்கலாம்.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டம் அதன் மாற்றங்களுடன் ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

பாடத்திட்டக் குழுவினர் கூறிய ஆலோசனைகளைத் தேவைக்கேற்ப ஏற்றுக்கொள்ளலாம் என்று பரிந்துரைத்தனர்.

5. பகுதி எண்.பா.தி.கு./07/05

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தில் முதன்மைப் பாடம் - I நன்னூல் எழுத்ததிகாரம் (காண்டிகையுரை) (22UTA1CC1), முதன்மைப் பாடம் - II இக்கால இலக்கியம் - I (22UTA1CC2), துணைமைப் பாடம் - I தமிழ் இலக்கிய வரலாறு (22UTA1AC1) ஆகியவற்றில் அலகு - 6 ஆக சுய கற்றல் பகுதி சேர்க்கப்படுகிறது. இது புறத்தேர்வுக்கு உரியதல்ல.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

6. பகுதி எண்.பா.தி.கு./07/06

தமிழாய்வுத்துறையில் 2021-2022 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறாம் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

2021-2022 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறாம் பருவப் பாடத்திட்டத்தில் பின்வரும் மாற்றங்கள் செய்யப்படுகின்றன:

* முதன்மைப் பாடம் XV - சங்க இலக்கியம் - 2 (19UTA6CC15) என்ற தாள் நீக்கப்படுகிறது.

* முதன்மைப் பாடம் XIV சங்க இலக்கியம் - 1 (19UTA6CC14) என்னும் தாள் `சங்க இலக்கியம்` (21UTA6CC14) என மாற்றப்படுகிறது.

* திட்டக்கட்டுரை Project Work என்ற தாள் புதிதாகச் சேர்க்கப்படுகிறது.

இம்மாற்றம் 2021-2022 கல்வியாண்டு முதல் இளங்கலை பயிலும் மாணவியருக்கு நடைமுறைப்படுத்தப்படுகிறது.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2019-2020 கல்வியாண்டு முதல் வழங்கப்படும் இளங்கலைத் தமிழிலக்கியத்திற்கான ஆறாம் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

7. பகுதி எண்.பா.தி.கு./07/07

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான நான்கு பருவங்களுக்குமான பாட வரையறையை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான நான்கு பருவங்களுக்குமான பாட வரையறை ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

8. பகுதி எண்.பா.தி.கு./07/08

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டத்தை ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

பாடத்திட்டத்தில் செய்யப்பட்டுள்ள மாற்றங்கள் :

- தொல்காப்பியச் சொல்லதிகாரத்திற்குச் சேனாவரையர் உரை என்றிருந்தது தெய்வச்சிலையார் உரை என முற்றிலுமாக மாற்றம் செய்யப்படுகிறது. அலகு 6இல் சுய கற்றல் பகுதி அமைக்கப்பட்டுள்ளது.
- புனைகதையும் உரைநடையும் என இவ்விரு வகைமைகளும் இணைக்கப்பட்டு ஒரு தாளாக்கப்பட்டுள்ளது. முற்றிலும் புதிதான புனைகதைகளும் உரைநடைகளும் பாடமாக வைக்கப்பட்டுள்ளன. அலகு 6இல் சுய கற்றல் பகுதியில் புனைகதை, உரைநடை - தோற்றமும் வளர்ச்சியும் இடம்பெற்றுள்ளது.
- காப்பியங்கள் தாளில் முற்றிலும் புதிதான காப்பியப் பகுதிகள் பாடமாக வைக்கப்பட்டுள்ளன. அலகு 6இல் சுய கற்றல் பகுதியில் காப்பியங்கள் - தோற்றமும் வளர்ச்சியும் என்னும் பகுதி இடம்பெற்றுள்ளது.
- சிற்றிலக்கியம் என்னும் புதிய தாள் புதிய பாடத்திட்டத்துடன் இடம்பெற்றுள்ளது.
- ஆராய்ச்சி நெறிமுறைகள் தாளில் அலகு 1இல் தமிழில் ஆராய்ச்சி வரலாறு, அலகு 3இல் தமிழில் மரபுவழி ஆய்வு நெறிகளும் புலப்பாட்டுத் திறனும் அலகு 5இல் வாய்மொழித் தேர்வு என்னும் பகுதிகள் புதிதாக இடம்பெற்றுள்ளன. அலகு 6இல் சுய கற்றல் பகுதியில் ஆய்வியல் ஆற்றுப்படை, ஆய்பொருள் தலைப்புகள் இடம்பெற்றுள்ளன.

கலந்துரையாடலின்போது கூறப்பட்ட ஆலோசனைகள் :

- தொல்காப்பியம் சொல்லதிகாரம் (தெய்வச்சிலையார் உரை) தாளில் சொல்லதிகாரம் முழுமையையும் கற்பித்தல் பகுதியில் இணைத்துவிட்டு சுய கற்றல் பகுதியில் அது தொடர்பான கருத்துக்களைக் கற்குமாறு அளிக்கலாம்.
- புனைகதையும் உரைநடையும் தாளில் தனிநபர்களின் சிறுகதைத் தொகுப்புகளைத் தவிர்த்துவிட்டு வெவ்வேறு எழுத்தாளர்களின் சிறுகதைகள் இணைந்த தொகுப்புகளைப் பாடநூலாக வைக்கலாம்.
- காப்பியங்கள் தாளில் புராணங்களைத் தவிர்க்கலாம்.
- சிற்றிலக்கியம் தாளில் பிள்ளைத்தமிழில் ஒவ்வொரு பருவத்திலும் மூன்று பாடல்களைப் பாடமாக வைக்கலாம்.
- திருமந்திரம் தாளில் பாடல் எண்ணிக்கை குறிப்பிடலாம்.
- ஆராய்ச்சி நெறிமுறைகள் தாளில் தற்கால ஆய்வுக்கேற்ற வகையில் புதிதாக அணுகுமுறைகள் இருக்கும்படி தாளை அமைக்கலாம்.

*வைணவமும் தமிழும் தாளில் தமிழில் எழுதப்பட்ட வைணவ இலக்கியங்களையே பாடங்களாக வைக்கலாம்.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான இரண்டாம் பருவத்திற்கான பாடத்திட்டம் அதன் மாற்றங்களுடன் ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

பாடத்திட்டக் குழுவினர் கூறிய ஆலோசனைகளைத் தேவைக்கேற்ப ஏற்றுக்கொள்ளலாம் என்று பரிந்துரைத்தனர்.

9. பகுதி எண்.பா.தி.கு./07/09

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசித்து அங்கீகாரமளித்துத் திருச்சிராப்பள்ளி காவேரி மகளிர் கல்லூரி (தன்னாட்சி) கல்விக்குழுவுக்குப் பரிந்துரை செய்தல்

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தில் Elective Course – I என்பது Discipline Specific Elective Course – I (DSE) என மாற்றப்பட்டு அதன்கீழ் கணினியும் இணையமும் தாள் கொண்டுவரப்பட்டு அதன் பாடக்குறியீடு 22PTA1DSE1A என மாற்றம் செய்யப்பட்டுள்ளது. அதனுடன் பிற தேர்வுத் தாள்களாக அளிக்கப்பட்ட மக்கள் தகவல் தொடர்பியல் தாளின் பாடக்குறியீடு 22PTA1DSE1B என்றும் சைவமும் தமிழும் தாளின் பாடக்குறியீடு 22PTA1DSE1C எனவும் மாற்றம் செய்யப்பட்டுள்ளது.

முதன்மைப் பாடம்-I - தொல்காப்பியம் – எழுத்ததிகாரம் (நச்சினார்க்கினியர் உரை) (22PTA1CC1), முதன்மைப் பாடம்-II - புதுக்கவிதையும் நாடகமும் (22PTA1CC2), முதன்மைப் பாடம்-III - சமய இலக்கியமும் சித்தர் இலக்கியமும் (22PTA1CC3), முதன்மைப் பாடம்-IV - இலக்கிய உரையாசிரியர்கள் (22PTA1CC4) மற்றும் Discipline Specific Elective Course – I (DSE) – கணினியும் இணையமும் (22PTA1DSE1A) ஆகிய தாள்களில் அலகு – 6 ஆக சுய கற்றல் பகுதி சேர்க்கப்பட்டுள்ளது. இது புறத்தேர்வுக்கு உரியதல்ல.

பின்வரும் தீர்மானம் ஏற்கப்பட்டது :

தமிழாய்வுத்துறையில் 2022-2023 கல்வியாண்டு முதல் வழங்கப்படும் முதுகலைத் தமிழிலக்கியத்திற்கான முதல் பருவப் பாடத்திட்டத்தின் மாற்றத்தை உறுதி செய்ய ஆலோசிக்கப்பட்டு அங்கீகாரம் வழங்கத் தீர்மானிக்கப்படுகிறது.

10. பகுதி எண்.பா.தி.கு./07/10

பாடத்திட்டம் உருவாக்கிய குழுவினரைப் பாராட்டுதல்

பாடத்திட்டத்தைச் சிறப்பான முறையில் உருவாக்கிய பாடத்திட்டக் குழுவினருக்குப் பாராட்டு தெரிவிக்கப்பட்டது.

பாடத்திட்ட வல்லுநர் குழுத் தலைவர் நன்றியுடன் ஏழாவது பாடத்திட்டக் குழுக்கூட்டம் நிறைவு பெற்றது.

தலைவர்
பாடத்திட்டக் குழுக் கூட்டம்

முனைவர் இரா.காமராசு
பாடத்திட்ட வல்லுநர்

முனைவர் த.டான் ஸ்டோனி
பாடத்திட்ட வல்லுநர்

முனைவர் சு.இராசாராம்
பல்கலைக்கழகப் பிரதிநிதி

முனைவர் கார்த்திகேஸ் பொன்னையா
பன்னாட்டுக் கல்வி வல்லுநர்

திரு.க.விஜயன்

செல்வி ப.ராகவி

முனைவர் அ.இரா.கோமதி - உறுப்பினர் -
முனைவர் அ.யசோதா - உறுப்பினர் -
முனைவர் ந.சுபா - உறுப்பினர் -
முனைவர் வி.கவிதா - உறுப்பினர் -
முனைவர் மு.ஜெயலெட்சுமி - உறுப்பினர் -
முனைவர் தி.மணிமொழி - உறுப்பினர் -
முனைவர் பா.கவிதா - உறுப்பினர் -
முனைவர் மே.க.வசந்தி - உறுப்பினர் -
முனைவர் இரா.வனிதா - உறுப்பினர் -
முனைவர் வி.சத்யவதி - உறுப்பினர் -
முனைவர் க.ராதிசா - உறுப்பினர் -
முனைவர் மு.அனு - உறுப்பினர் -
முனைவர் ப.சசிரேகா - உறுப்பினர் -
முனைவர் மா.ஆசியாதாரா - உறுப்பினர் -
முனைவர் ச.தீபா - உறுப்பினர் -
முனைவர் க.அகல்யா - உறுப்பினர் -
முனைவர் இர.கீர்த்தனா - உறுப்பினர் -
முனைவர் செ.புனிதா - உறுப்பினர் -
முனைவர் தெ.அகிலா - உறுப்பினர் -
திருமதி பொ.அபிராமி - உறுப்பினர் -
செல்வி மு.கோடஸ்வரி - மாணவியர் பிரதிநிதி -
செல்வி அ.பிரியங்கா - மாணவியர் பிரதிநிதி -

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

திருச்சிராப்பள்ளி – 620 018

தமிழாய்வுத்துறை

(2022 – 2023 ஆம் கல்வியாண்டு மாணவியர் சேர்க்கைக்கான
பாடத்திட்டம்)



இளங்கலைத் தமிழிலக்கியம்
(முதல் & இரண்டாம் பருவம்)

VISION AND MISSION OF THE DEPARTMENT

தமிழாய்வுத்துறையின் நோக்கும் போக்கும்

VISION

It aims to guide the development of language skills, research skills, creativity etc. with social thinking.

நோக்கு

மொழித்திறன், ஆய்வுத்திறன், படைப்புத்திறன் போன்றவற்றில் சமூகச் சிந்தனையுடனான மேம்பாட்டினை அடைய வழிகாட்டுதல்.

MISSION

Language and Literacy aims at imparting biological values and fulfilling employment needs.

போக்கு

மொழி மற்றும் இலக்கியத்திறன் வழி வாழ்வியல் விழுமியங்களை உணர்த்தி வேலைவாய்ப்புத் தேவைகளை நிறைவேற்றுதல்.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	<p>LEARNING ENVIRONMENT</p> <p>To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.</p> <p>கற்கும் சூழல்</p> <p>உயர் தரக் கற்றலுக்கேற்றவாறு, புதுமையான கற்றல் முறைகளைப் பயன்படுத்தி மதிப்புகளோடு கூடிய முழுமையான மற்றும் விரிவான கற்றலை வழங்குதல் மற்றும் மாணவர்கள் அவர்கள் தேர்ந்தெடுத்த துறைகளில் திறமையானவர்களாக இருக்கப் பயிற்சியளித்தல்.</p>
PEO2	<p>ACADEMIC EXCELLENCE</p> <p>To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.</p> <p>கல்விசார் சிறப்பு</p> <p>மாணவர்களின் உள்ளார்ந்த திறன்களை வெளிக்கொணரவும் விமர்சன சிந்தனையினை வளர்க்கவும் இலக்கை அடைய ஊக்குவிக்கவும் ஏற்ற சூழலை வழங்குதல்.</p>
PEO3	<p>EMPLOYABILITY</p> <p>To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.</p> <p>வேலை வாய்ப்பு</p> <p>மாறிவரும் உலகளாவிய சூழலுக்கு ஏற்றவாறு மாணவர்களைத் தேவையான திறன்களுடன் தயார்படுத்துதல் மற்றும் பல்துறை சார்ந்த களங்களில் உள்ள தொழில் வாய்ப்புகளை அறிமுகப்படுத்துதல்.</p>

<p>PEO4</p>	<p>PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY</p> <p>To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.</p> <p>தொழில்முறை நெறிமுறைகள் மற்றும் சமூகப் பொறுப்பு</p> <p>உயரிய நெறிமுறைகள் மற்றும் சமத்துவத்தைக் கற்பித்துச் சமூகப் பொறுப்புணர்வை வளர்ப்பதன் மூலம் தேசத்தின் வளர்ச்சிக்குத் தேவையான வளமையான மனப்பான்மையுடன் கூடி ஆளுமைகளாக அவர்களை மாற்றுதல்.</p>
<p>PEO5</p>	<p>GREEN SUSTAINABILITY</p> <p>To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.</p> <p>பசுமை நிலைத்தன்மை</p> <p>சமூக மற்றும் சுற்றுச்சூழல் செயல்பாடுகளில் தொழில்முறைத் தீர்வுகளின் தாக்கத்தைப் புரிந்துகொள்ளுதல் மற்றும் ஒட்டுமொத்த நிலையான வளர்ச்சிக்கான அறிவை உருவாக்குதல்.</p>

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தமிழாய்வுத்துறை

(2022 – 2023 ஆம் கல்வியாண்டு முதல் மாணவியர் சேர்க்கைக்கானது)

PROGRAMME OUTCOME (POs - UG)

PO NO	பட்டப்படிப்பின் பயன்கள்
PO1	Understanding the social context through the acquisition of linguistic knowledge. மொழியறிவைப் பெறுவதன் (வழியாக) வாயிலாக சமூகச் சூழலைப் புரிந்து கொள்ளுதல் (சமூக சிந்தனையுடன் கூடிய கல்வித்திறன்)
PO2	Effective expression of ideas through the media and appropriate texts; and evaluation of policy and principles using social science approaches. தகுந்த நூல்கள் ஊடகங்களைப் பயன்படுத்தி சிந்தனைகளைத் திறம்பட வெளிப்படுத்துதல் மற்றும் சமூக அறிவியல் அணுகு முறைகளைப் பயன்படுத்தி கொள்கை மற்றும் கோட்பாடுகளை மதிப்பிடுதல் (தகுதியுடன் கூடிய திறன் பெறுதல்)
PO3	Gaining skills, research team attitudes and coaching skills to cope with a multicultural society (developing attitudes and problem solving). பன்முகக் கலாச்சாரம் கொண்ட சமூகத்தை எதிர் கொள்வதற்கேற்ற வகையில் ஆராய்ச்சித்திறன் குழு மனப்பான்மை, பயிற்சிப் பணி ஆகிய திறன்களைப், பயிற்சிகளைப் பெறுதல் (மனப்பான்மையை உருவாக்குதல் மற்றும் சிக்கலைத் தீர்த்தல்)
PO4	Ability to use prototypes and writers' ideas in relation to solving a variety of problems (leadership, critical analysis). பல்வேறு வகையான சிக்கல்களைத் தீர்ப்பதற்கு முன்மாதிரிகள், எழுத்தாளர்களின் கருத்துகளைத் தொடர்புபடுத்திப் பயன்படுத்தும் திறன் பெறுதல் (தலைமைப்பண்பு, விமர்சனப் பகுப்பாய்வு)
PO5	To face the changing work environment through knowledge and skills, to develop a scientific mindset that is conducive to personal and social development, and to enable lifelong learning. அறிவு மற்றும் திறன் வாயிலாக மாறிவரும் பணிச் சூழலை எதிர்கொள்ள, தனிப்பட்ட மற்றும் சமூக வளர்ச்சிக்கேற்ற அறிவியல் மனப்பான்மையை வளர்த்து, வாழ்நாள் கற்றலைப் பெறச் செய்தல்

பட்டப்பிரிவின் பயன்கள்

PROGRAMME SPECIFIC OUTCOMES – BA TAMIL

PSO NO	இளங்கலைத்தமிழ் பட்டப்படிப்பின் நிறைவில் மாணவியர் STUDENTS OF BA TAMIL WILL BE ABLE TO
PSO1	Acquisition of knowledge of social thought and language skills through literature and grammar. இலக்கியங்கள் மற்றும் இலக்கணங்கள் வாயிலாகச் சமூகச் சிந்தனைகள் மற்றும் மொழித் திறன் பற்றிய அறிவு பெறுவர்.
PSO2	Gain knowledge of literature and grammar and acquire the ability to create works and theories. இலக்கியம் மற்றும் இலக்கண உருவாக்கம் பற்றிய அறிவு பெற்றுப் படைப்புகள் மற்றும் கோட்பாடுகளை உருவாக்கும் திறன் பெறுவர்
PSO3	Learning to know and apply to life the values expressed in literature and grammar. இலக்கியங்கள் மற்றும் இலக்கணங்கள் வெளிப்படுத்தும் விழுமியங்களை அறிந்து வாழ்விற்குப் பயன்படுத்தக் கற்பர்.
PSO4	Improving personality through learning literature and grammar. இலக்கியங்கள் மற்றும் இலக்கணங்களைக் கற்றல் வழி ஆளுமைத்திறனில் மேம்படுவர்.
PSO5	Acquiring skills tailored to emerging work needs. வளர்ந்து வரும் பணித் தேவைகளுக்கேற்ற திறன்களைப் பெறுவர்.

காவேரி மகளிர் கல்லூரி (தன்னாட்சி), திருச்சி – 18

(2022 – 2023 ஆம் கல்வியாண்டு முதல் சேர்க்கை பெறும் மாணவியருக்கு)

தமிழாய்வுத்துறை

இளங்கலைத் தமிழிலக்கியம் - முதற்பருவம்

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
I	I	Language Course-I (LC)	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100	
			Hindi Literature & Grammar-1	22ULH1							
			Basic French – I	22ULF1							
			History of Popular Tales, Literature and Sanskrit Story	22ULS1							
	II	English Language Course- I(ELC)	Functional English for Effective Communication-1	22UE1	6	3	3	25	75	100	
	III	Core Course – I(CC)	நன்னூல் – எழுத்ததிகாரம் (காண்டிகையுரை)	22UTA1CC1	6	6	3	25	75	100	
				இக்கால இலக்கியம் - I	22UTA1CC2	6	6	3	25	75	100
				First Allied Course- I (AC)	22UTA1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100	
	Total					30	23	-	-	-	600
II	I	Language Course-II(LC)	இடைக்கால இலக்கியமும் புதினமும்	22ULT2	5	3	3	25	75	100	
			Hindi Literature & Grammar-II	22ULH2							
			Basic French – II	22ULF2							
			Poetry Textual Grammar and Alakara	22ULS2							
	I	English Language Course- II(ELC)	Functional English for Effective Communication –II	22UE2	6	3	3	25	75	100	
	II	Core Course – III (CC)	நன்னூல் – சொல்லதிகாரம் (காண்டிகையுரை)	22UTA2CC3	6	6	3	25	75	100	
				இக்கால இலக்கியம் - II	22UTA2CC4	6	6	3	25	75	100
				First Allied Course – II (AC)	22UTA2AC2	5	3	3	25	75	100
				Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-
	Total					30	23	-	-	-	600

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	பாயிரவியல் (1-55 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	எழுத்தியல் (56-121, 127 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	பதவியல் (128-145 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	உயிரீற்றுப் புணரியல், மெய்யீற்றுப் புணரியல் (151-239 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	உருபு புணரியல் (240 - 257 நூற்பாக்கள்)	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல சிறப்புப் பாயிரம், போலி (122 – 125), எழுத்துச்சாரியை (126), வடமொழியாக்கம் (146 – 150)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	ஆறுமுக நாவலர் (ப.ஆ.)	நன்னூல் காண்டிகை உரை	ஆறுமுகநாவலர் வி.அச்சகம், 300, தங்கசாலைத் தெரு, சென்னை -1.	1966 (24ஆம் பதிப்பு)

பார்வை நூல்கள் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	சங்கர நமச்சிவாயப் புலவர் (உ.ஆ.)	நன்னூல் விருத்தியுரை	கழக வெளியீடு, சென்னை	1968
2	சண்முகம், செ.வை.	எழுத்திலக்கணக் கோட்பாடு	உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை	2012

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

முனைவர் மா. ஆசியாதாரா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

Semester I	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UTA1CC2	இக்கால இலக்கியம் - I	CORE	6	6

நோக்கம்

1. தமிழில் மரபுக் கவிதை புனையும் கவிஞர்களையும் மரபுக்கவிதைகளையும் அறிமுகம் செய்தல்
2. தமிழில்புதுக் கவிதை புனையும் கவிஞர்களையும் புதுக்கவிதைகளையும் அறிமுகம் செய்தல்
3. உரைநடை இலக்கியத்தின் பயனை எடுத்துரைத்தல்.
4. இக்கால இலக்கியத்தின் மீதான ஆர்வத்தைத் தூண்டுதல்
5. புதிய இலக்கியங்களைப் படைக்கச் செய்தல்.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	இக்கால இலக்கியங்கள் உணர்த்தும் சமுதாயச் சிந்தனைகளையும், சமூகச்சூழலையும் ஆய்ந்து அதனைத் தற்கால வாழ்வியல் சூழலோடுப் பொருத்தி மதிப்பீடு செய்தல்	K1
CO2	இக்கால இலக்கியங்களின் காணலாகும் மொழி வழக்காறுகளை ஆய்ந்து அதன் வழி மொழிப் பயன்பாட்டினை மதிப்பிடல்	K2
CO3	பன்முகத் தன்மை கொண்ட இக்கால இலக்கியங்கள் உணர்த்தும் வாழ்வியல் கோட்பாடுகளை ஆய்ந்தறிந்து விழுமியங்களைப் பயன்படுத்துதல்	K3
CO4	போட்டித் தேர்வுகளுக்குத் தயாராகும் வகையில் இக்கால இலக்கியத்தின் கூறுகளைப் பகுத்தாய்வு செய்யவும் அதனை மதிப்பீட்டு நோக்கோடு அணுகவும் கற்றுத் தருதல்	K4
CO5	இக்கால இலக்கியங்கள் வழி சமூகப் பண்பாட்டினைக் கண்டறிவதுடன் படைக்கும் ஆற்றலையும் உய்த்துணர்ந்து படைப்பாக்க ஆர்வத்தை ஏற்படுத்துதல்	K4

Mapping of CO with PO and PSO

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	2	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கவிதை - பாஞ்சாலி சபதம் - பாரதியார்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	கவிதை - புரட்சிக்கவி - பாரதிதாசன், வணக்கம் வள்ளுவ - ஈரோடு தமிழன்பன்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	கவிதை - தமிழுக்கு நிறமுண்டு - வைரமுத்து	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	உரைநடை - அறிவுரைக் கொத்து - மறைமலை அடிகள், முருகன் அல்லது அழகு - திரு.வி.க (முதல் 5 கட்டுரைகள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	உரைநடை - தமிழ் விருந்து - ரா.பி. சேதுப்பிள்ளை	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல : கவிதை - கனவுகள் + கற்பனைகள் = காகிதங்கள் - மீரா	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல்கள் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	பாரதியார்	பாரதியார் கவிதைகள்	மணி வாசகர் பதிப்பகம்	2000
2.	பாரதிதாசன்	பாரதிதாசன் கவிதைகள்	மணி வாசகர் பதிப்பகம்	2000
3.	ஈரோடு தமிழன்பன்	வணக்கம் வள்ளுவ	பூம்புகார் பதிப்பகம் பிராட்வே சென்னை	2021
4.	வைரமுத்து	தமிழக்க நிறமுண்டு	திருமகள் பதிப்பகம் சென்னை	2010
5.	மறைமலை அடிகள்	அறிவுரைக் கொத்து	மணி வாசகர் பதிப்பகம்	2001
6.	திரு.வி.க	முருகன் அல்லது அழகு	மணி வாசகர் பதிப்பகம்	2001
7.	ரா.பி. சேதுப்பிள்ளை	தமிழ் விருந்து	பழனியப்பா பிரதர்ஸ்	1998
8.	மீரா	கனவுகள் + கற்பனைகள் = காகிதங்கள்	அகரம் பதிப்பகம், தஞ்சாவூர்	1971

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

முனைவர் வி. சத்யவதி

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சங்கம் பற்றிய செய்திகள் - முச்சங்கங்கள் - அகத்தியம் - இறையனார் அகப்பொருள் - முத்தொள்ளாயிரம் - தொல்காப்பியம் - சங்க இலக்கியங்கள் - பத்துப்பாட்டு , எட்டுத்தொகை	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	சங்கம் மருவிய கால இலக்கியங்கள் - இரட்டைக்காப்பியங்கள் பதினெண் கீழ்க்கணக்கு நூல்கள்	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	பக்தி இலக்கியங்கள் - சைவம், வைணவம் - காப்பியங்கள் - சீவகசிந்தாமணி, கம்பராமாயணம் - பெரியபுராணம் - சீறாப்புராணம், தேம்பாவணி, ஐஞ்சிறு காப்பியங்கள்.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	சிறுநிலக்கியங்கள் - பிள்ளைத்தமிழ்- கலம்பகம் - உலா - தூது - குறவஞ்சி - பரணி - பள்ளு - அந்தாதி - தனிப்பாடல்கள்.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	உரைநடை, மரபுக்கவிதை, புதுக்கவிதை, சிறுகதை , புதினம் - நாடகம்	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல சாகித்திய அகாதமி விருது பெற்ற படைப்புகள் - தன் வரலாற்றுப்படி படைப்புகள்	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல்

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	சு.ஆனந்தன்	தமிழ் இலக்கிய வரலாறு	கண்மணி பதிப்பகம் 23, சங்கரன் பிள்ளை சாலை, திருச்சி - 02	2002
பார்வை நூல்கள்				
1	மு.வரதராசன்	தமிழ் இலக்கிய வரலாறு	சாகித்திய அகாதெமி, சென்னை.	1970
2	முனைவர் பாக்கியமேரி	வகைமை நோக்கில் தமிழ் இலக்கிய வரலாறு	நியு செஞ்சுரி புக் ஹவுஸ் (பி) லிட், சென்னை.	2011

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

www.projectmadurai.org

முனைவர் இர.கீர்த்தனா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	பெயரியல் (258-289 நூற்பாக்கள்)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	பெயரியல் (290-319 நூற்பாக்கள்)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	வினையியல் (320-351 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	பொதுவியல் (352-403 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	இடையியல் (420-441 நூற்பாக்கள்) உரியியல் (442-462 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	சுய கற்றல் (இப்பகுதி பருவத் தேர்வுக்கு உரியதல்ல) பொதுவியல் (404-419 நூற்பாக்கள்)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல் :

- ஆறுமுக நாவலர் (ப.ஆ.), (1966) (24ஆம் பதிப்பு), நன்னூல் காண்டிகை உரை, ஆறுமுகநாவலர் வி.அச்சகம், 300, தங்கசாலைத் தெரு, சென்னை -1.

பார்வை நூல்கள் :

- சங்கர நமச்சிவாயப் புலவர் (உ.ஆ.), (1968), நன்னூல் விருத்தியுரை, கழக வெளியீடு, சென்னை.
- சண்முகம், செ.வை., (2008), சொல்லிலக்கணக் கோட்பாடு, உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை.

கற்பித்தல் முறைகள்

கரும்பலகை, குழு விவாதம், கலந்தாய்வு, திட்டக் கட்டுரை, வினாடி வினா.

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

Semester II	Internal Marks : 25	External Mark 75		
COURSE CODE	COURSE TITLE	Category	Hrs/Week	Credits
22UTA2CC4	இக்கால இலக்கியம் – II	CORE	6	6

நோக்கம்

1. தமிழில் சிறுகதை புனையும் கதாசிரியர்களை அறிமுகம் செய்தல்
2. தமிழில் புதினஆசிரியர்களையும் அவர்களின் படைப்புத் திறனையும் அறிய செய்தல்
3. நாடக இலக்கியத்தின் பயனை எடுத்துரைத்தல்
4. இக்கால இலக்கியத்தின் மீதான ஈர்ப்பைத் தூண்டுதல்
5. புதிய இலக்கியங்களைப் படைக்கச் செய்தல்
- 6.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	தமிழ்ப் புத்திலக்கியங்களின் சிறப்புகளைக் கண்டறிந்து அதன் இலக்கியக் கூறுகளை வகைப்படுத்தி பகுத்தாய்தல்	K4
CO2	நவீன இலக்கியங்களின் சிறப்புகளைத் தெரிந்து இலக்கிய நுட்பங்களையும் கட்டமைப்புகளையும் எளிமைப்படுத்தி விளக்குதல்	K2
CO3	புத்திலக்கியங்களின் தன்மையைப் பகுத்தாய்ந்து அதன் வரையறைகளையும் வகைபாடுகளையும் ஆய்வு செய்தல்	K3 K4
CO4	நவீன இலக்கியத்தின் புதிய உத்தி முறைகளை சிறுகதை, புதினம், நாடக இலக்கியங்களில் பொருத்தி விளக்குவது மற்றும் அவ்விலக்கியங்களின் கட்டமைப்பை பிற இலக்கியங்களோடு ஒப்பீடு செய்வது	K3 K4
CO5	நவீன இலக்கியங்களின் உட்கூறுகளை மாணவர்களை உணரச்செய்து மாறுபட்ட புதிய இலக்கியங்களை உருவாக்கி அதனை ஆய்வு செய்ய அவர்களை ஆயத்தப்படுத்துதல்	K4

Mapping with CO, PO &PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	3	3	3	2	3	2	3	3
CO4	3	3	2	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சிறுகதை தாமரைச்சிறுகதைகள்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	சிறுகதை - உறவு	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	புதினம் - விருட்சங்களாகும்விதைகள்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	புதினம் - வயல்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	நாடகம் - அசாதசத்ரு	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	(சுயகற்றல்) இப் பகுதி பருவத் தேர்விற்கு உரியதல்ல நாடகம் சாபம்விமோசனம்		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

பாட நூல்கள்

சுபாசுசந்திரபோஸ்.ச, (2013), தாமரைச்சிறுகதைகள், ஐந்தாம்பதிப்பு, நியுசெஞ்சுரிபுக்ஹவுஸ்.

பாண்டியராஜன் .எம், (2014), உறவு, நான்காம்பதிப்பு, பாவைபப்ளிகேஷன்ஸ்.

பாமா, (2022), விருட்சங்களாகும்விதைகள், முதற்பதிப்பு, நியுசெஞ்சுரிபுக்ஹவுஸ்.

பாலசுப்ரமணியன் . கு.வெ, (2019), வயல், முதற்பதிப்பு, நியுசெஞ்சுரிபுக்ஹவுஸ்.

நாஞ்சில்ஆனந்தன், (2007), அசாதசத்ரு, ஐந்தாம்பதிப்பு, கண்மணிபதிப்பகம்.

ராமசாமி.மு, (2012) சாபம்விமோச்சனம், முதற்பதிப்பு, நியுசெஞ்சுரிபுக்ஹவுஸ்.

கற்பித்தல் முறைகள்

கலந்தாய்வுவினாடி , வினாகுழுவிவாதம் ,கரும்பலகை ,திட்டக்கட்டுரை ,

பாடத்திட்டவடிவமைப்பாளர்

முனைவர்வி.சத்யவதி

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22UTA2AC2	தமிழர் நுண்கலைகள்	AC	5	3

நோக்கம்

1. கலைகளின் தோற்றம் வளர்ச்சி குறித்து அறிவர்.
2. இசை, ஆடற், சிற்பக் கலைகள் பற்றிய அறிவைப் பெறுவர்.
3. நாடகத் துறையின் வளர்ச்சி மற்றும் இன்றைய நிலையைப் பற்றியும் அறிவர்.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	கலைகளின் வாயிலாக அக்காலச் சமூகச் சூழலைக் கண்டறிதல்	K4
CO2	கலைகள் சுட்டும் சிந்தனை கோட்பாடுகளைப் பகுத்துணர்ந்து புதியன உருவாக்கும் திறன் பெறுதல்	K5, K6
CO3	கலைகள் உணர்த்தும் நுண்ணிய விழுமியங்களை அறிந்து வாழ்வில் பயன்படுத்துதல்	K3
CO4	கலைகளைக் கற்றலின் வழி ஆளுமைத் திறனை மேம்படுத்துதல்	K5
CO5	கலைத்துறையில் உள்ள பணிகள் குறித்துக் கண்டறிதல்	K3

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கலைகள் - தமிழர் நுண் கலைகள் - விளக்கம் - கலைகளின் தோற்றமும் வளர்ச்சியும் - கலை வளர்த்த பாணர், விறலி, புலவர்கள் - புரவலர்கள் - இலக்கியங்கள்.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
II	தமிழில் இசைக்கலை - சங்க கால இசை - இசைக்கருவிகள் - காலந்தோறும் இசைக்கலை வளர்ந்த வரலாறு - கோயில்கள் மூலம் வளர்ந்த இசைக்கலை	15	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4
III	தமிழகத்தில் ஆடற்கலை - தோற்றமும் வளர்ச்சியும் - பரத நாட்டியம் - பரதமுனிவர் கோயில்கள் - கோயில்கள் மூலம் வளர்ந்த நாட்டியக் கலைகள்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	தமிழகச் சிற்பக்கலை - ஓவியக்கலை - தோற்றமும் வளர்ச்சியும் - தமிழகக் கோயில்களில் சிற்பங்களும் ஓவியங்களும்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	நாடகக் கலை - நாடகக் கலையின் தோற்றம் - நாடகக் கலையில் ஏற்பட்ட வளர்ச்சி	15	CO1, CO2, CO3,	K1, K2, K3,

	நிலைகள் – இன்றைய திரைப்படம் முதல் சின்னத்திரை வரை		CO4, CO5	K4, K5
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கலைகள் மற்றும் கவிஞர்கள் குறித்த இன்றைய போக்கினை அறிதல்	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல்

வ.எண்	ஆசிரியர்	வெளியிட்ட ஆண்டு	நூல்	பதிப்பு	பதிப்பக முகவரி
1	வேங்கடசாமி	1972	நுண் கலைகள்	இரண்டாம் பதிப்பு	மணிவாசகர் பதிப்பகம்

பார்வை நூல்கள்

வ.எண்	ஆசிரியர்	வெளியிட்ட ஆண்டு	நூல்	பதிப்பு	பதிப்பக முகவரி
1	வேங்கடசாமி.சீனி.மயிலை		தமிழர் வளர்த்த அழகுக் கலைகள்		

இணையதளமுகவரிகள்

- <https://www.tamilvu.org/ta/courses-degree-p102-p1023-html-p1023112-25025>
- <https://www.tamilvu.org/ta/courses-degree-c031-c0312-html-c0312213-17485>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடத்திட்ட வடிவமைப்பாளர்

முனைவர் மே.க.வசந்தி

காவேரி மகளிர் கல்லூரி (தன்னாட்சி), திருச்சி - 18
CBCS பாடத்திட்டம்
(2021 - 2022 ஆம் கல்வியாண்டு முதல் சேர்க்கை பெறும் மாணவியருக்கு)
தமிழாய்வுத்துறை - இளங்கலைத் தமிழிலக்கியம்

Sem	Part	Course	Title	Course Code	Ins. Hrs / Week	Credit	Exam	Marks		Total	
							Hours	Internal	External		
VI	III	Core Course – XIII (CC)	தண்டியலங்காரம்	19UTA6CC13	6	5	3	25	75	100	
		Core Course – XIV (CC)	சங்க இலக்கியம்	21UTA6CC14	6	5	3	25	75	100	
		Major Based Elective II	II. அ) நாடகவியல் (or) II. அ) கோயில் கலைகள்	19UTA6MBE2A 19UTA6MBE2B	5	4	3	25	75	100	
		Major Based Elective III	III. அ) சுற்றுலாவியல் (or) III. ஆ) வாழ்க்கை வரலாற்று இலக்கியம் (உ.வே.சா)	19UTA6MBE3A 19UTA6MBE3B	6	4	3	25	75	100	
		Project	Project Work	21UTA6PW	6	5	-	-	100	100	
	V	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100	
		Extension Activity	Extension Activity	19UGEA	-	1	-	-	-	-	
	TOTAL					30	25				600
	OVER ALL TOTAL					180	140				3900

பாடக் குறியீடு	பாடம்	Category	L	T	P	Credit
21UTA6CC14	சங்க இலக்கியம்	III	86	4	-	5

நோக்கம் :

1. தமிழர்களின் அக புற வாழ்வியலை அறிதல்.
2. வரலாற்றுச் செய்திகள், தமிழரது பண்பாடு, இயற்கை போற்றிய திறம் ஆகியவற்றை உணர வைத்தல்.
3. பழந்தமிழரின் செம்மாந்த அறம், மறம், கொடைப் பண்புகளை எடுத்துரைத்தல்

COURSE OUTCOMES

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Knowledge Level
CO1	சங்கத் தமிழரது வாழ்வியல் முறைகளைக் கண்டறிதல்	K1
CO2	சங்க இலக்கியப் பகுப்பு முறையை உணர்தல்	K2
CO3	திணை, துறைக் கோட்பாடுகளை இணைத்தறிதல்	K3
CO4	சங்க கால மக்களுக்கிடையிலான உறவு, நட்பு, பாகுபாட்டினை ஆராய்ந்தறிதல்	K4

பாடத்திட்டம் :

அலகு 1 : (20 மணி)

நற்றிணை : 101 முதல் 105 பாடல்கள் வரை

குறுந்தொகை : 26 முதல் 35 பாடல்கள் வரை

ஐங்குறுநூறு : அன்னாய் வாழிப்பத்து

அலகு 2 : (15 மணி)

கலித்தொகை : குறிஞ்சிக்கலி – முதல் 5 பாடல்கள்

அகநானூறு : களிற்றியானைநிரை 1 - 10 பாடல்கள்

பரிபாடல் : திருமால் - பாடல் எண் - 2

அலகு 3 : (20 மணி)

புறுநானூறு : 101 - 120, பாடல்கள் வரை மொத்தம் 20 பாடல்கள்

பதிற்றுப்பத்து : இரண்டாம்பத்து - முதல் 5 பாடல்கள்

அலகு 4 : (15 மணி)

முல்லைப்பாட்டு

அலகு 5 : (20 மணி)

பொருநராற்றுப்படை

பார்வை நூல்கள் :

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	ஒளவை சு. துரைசாமி பிள்ளை (உரை)	நற்றிணை	கழக வெளியீடு	2008
2	ஒளவை சு. துரைசாமி பிள்ளை (உரை)	புறநானூறு	கழக வெளியீடு	2008
3	ஒளவை சு. துரைசாமி பிள்ளை (உரை)	பதிற்றுப்பத்து	கழக வெளியீடு	2008
4	ஒளவை சு. துரைசாமி பிள்ளை (உரை)	குறுந்தொகை	கழக வெளியீடு	2007
5	ந.மு. வேங்கடசாமி நாட்டார் (உரை)	அகநானூறு	கழக வெளியீடு	2008
6	ஒளவை துரைசாமி பிள்ளை (உ.ஆ.)	ஐங்குறுநூறு	கழக வெளியீடு	2008
7	நச்சினார்க்கினியர் (உ.ஆ.)	கலித்தொகை	கழக வெளியீடு, சென்னை	1943
8	பொ.வே.சோமசுந்தரனார் (உரை)	பரிபாடல்	கழக வெளியீடு	2008
9	பொ.வே.சோமசுந்தரனார்(உ.ஆ)	பத்துப்பாட்டு பகுதி 1, 2	கழக வெளியீடு	2008

கற்பித்தல் முறைகள் :

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர் மு. அனு

தலைவர்
பாடத்திட்டக் குழுக் கூட்டம்

முனைவர் இரா.காமராசு
பாடத்திட்ட வல்லுநர்

முனைவர் த.டான் ஸ்டோனி
பாடத்திட்ட வல்லுநர்

முனைவர் சு.இராசாராம்
பல்கலைக்கழகப் பிரதிநிதி

முனைவர் கார்த்திகேஸ் பொன்னையா
பன்னாட்டுக் கல்வி வல்லுநர்

திரு.க.விஜயன்

செல்வி ப.ராகவி

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

திருச்சிராப்பள்ளி – 620 018

தமிழாய்வுத்துறை

(2022 – 2023 ஆம் கல்வியாண்டு மாணவியர் சேர்க்கைக்கான
பாடத்திட்டம்)



முதுகலைத் தமிழிலக்கியம்
(முதல் & இரண்டாம் பருவம்)

VISION AND MISSION OF THE DEPARTMENT

தமிழாய்வுத்துறையின் நோக்கும் போக்கும்

VISION

It aims to guide the development of language skills, research skills, creativity etc. with social thinking.

நோக்கு

மொழித்திறன், ஆய்வுத்திறன், படைப்புத்திறன் போன்றவற்றில் சமூகச் சிந்தனையுடனான மேம்பாட்டினை அடைய வழிகாட்டுதல்.

MISSION

Language and Literacy aims at imparting biological values and fulfilling employment needs.

போக்கு

மொழி மற்றும் இலக்கியத்திறன் வழி வாழ்வியல் விழுமியங்களை உணர்த்தி வேலைவாய்ப்புத் தேவைகளை நிறைவேற்றுதல்.

காவேரி மகளிர் கல்லூரி (தன்னாட்சி)

தமிழாய்வுத்துறை

(2022 – 2023 ஆம் கல்வியாண்டு முதல் மாணவியர் சேர்க்கைக்கானது)

PROGRAMME OUTCOME (Pos - PG)

PO NO	பட்டப்படிப்பின் பயன்கள்
PO1	<p>Develop comprehensive knowledge in dealing with problems and challenges arising in the society and apply the knowledge in the living environment (social responsibility).</p> <p>சமுதாயத்தில் எழும் பிரச்சனைகள் மற்றும் சவால்களை எதிர்கொள்வதில் விரிவான அறிவை வெளிப்படுத்துதல் மற்றும் வாழ்க்கை சூழலில் அக்கல்வியறிவைப் பயன்படுத்துதல் (சமூகப் பொறுப்புணர்வு)</p>
PO2	<p>To make a better contribution to the society, to gain in-depth knowledge of various types of literary texts (Achieving the goal).</p> <p>சமுதாயத்திற்கு சிறந்த பங்களிப்பை வழங்கல், பல்வேறு வகையான இலக்கிய நூல்களில் ஆழமான அறிவைப் பெறுதல் (இலக்கை அடைதல்)</p>
PO3	<p>Achieving leadership goals through advanced learning and gaining vision (professionalism).</p> <p>மேம்பட்ட கற்றலின் மூலம் தலைமைத்துவத் திறன்களை உணர்ந்து இலக்கை அடைவதற்கான தொலைநோக்குப் பார்வை பெறுதல் (தொழில்முறைத் திறன்)</p>
PO4	<p>Discovering the resources needed for research projects and gaining new ideas for life with experience gained through internship (discovering innovations).</p> <p>ஆராய்ச்சித் திட்டங்களுக்குத் தேவையான ஆதாரங்களைக் கண்டறிதல் மற்றும் பயிற்சிப் பணியின் (Internship) மூலம் பெற்ற அனுபவத்தைக் கொண்டு வாழ்வியலுக்கான புதிய சிந்தனைகளைப் பெறுதல் (புதுமைகளைக் கண்டறிதல்)</p>
PO5	<p>Develop a scientific mindset and ability to pursue research courses for higher education and career opportunities (Develop a scientific mindset).</p> <p>உயர்கல்வி மற்றும் தொழில் வாய்ப்புகளுக்கான ஆராய்ச்சிப் படிப்புகளை மேற்கொள்வதற்கான அறிவியல் மனப்பான்மை மற்றும் திறனை உருவாக்குதல் (அறிவியல் மனப்பான்மையை உருவாக்குதல்)</p>

பட்டப்பிரிவின் பயன்கள்

PROGRAMME SPECIFIC OUTCOMES – MA TAMIL

PSO NO	முதுகலைத்தமிழ் பட்டப்படிப்பின் நிறைவில் மாணவியர் STUDENTS OF MA TAMIL WILL BE ABLE TO
PSO1	Gaining social thinking and advanced language skills and the ability to handle language better. சமூகச் சிந்தனைகள் மற்றும் மேம்பட்ட மொழித்திறன் பெற்று சிறந்த முறையில் மொழியைக் கையாளும் திறன் பெறுவர்
PSO2	Ability to learn different approaches. பல்வேறு அணுகுமுறைகளைக் கற்றுத் திறனாயும் திறனைப்பெறுவர்.
PSO3	Gaining research skills and leadership skills through fieldwork and research. களப்பணி, ஆராய்ச்சிப்பணி வாயிலாக ஆய்வுத்திறனையும் தலைமைத்துவத் திறன்களையும் பெறுவர்.
PSO4	Gaining the ability and ideas to be socially responsible to create new creations. சமூகப் பொறுப்புணர்ந்து புதிய சிந்தனைகளைப் பெற்று புதிய படைப்பாக்கங்களை உருவாக்கும் திறன் பெறுவர்.
PSO5	Gaining knowledge to adapt to changing work environment and competitive exams. மாறிவரும் பணிச் சூழலுக்கேற்பவும் போட்டித் தேர்வுகளுக்கேற்பவும் அறிவுத்திறன் பெறுவர்.

Semester	Course	Course Title	Course Code	Inst. Hrs./ week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	தொல்காப்பியம் – எழுத்ததிகாரம் (நச்சினார்க்கினியர் உரை)	22PTA1CC1	6	5	3	25	75	100
	Core Course – II (CC)	புதுக்கவிதையும் நாடகமும்	22PTA1CC2	6	5	3	25	75	100
	Core Course –III (CC)	சமய இலக்கியமும் சித்தர் இலக்கியமும்	22PTA1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	இலக்கிய உரையாசிரியர்கள்	22PTA1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. கணினியும் இணையமும்	22PTA1DSE1A	6	3	3	25	75	100
		B. மக்கள்தகவல் தொடர்பியல்	22PTA1DSE1B						
		C. சைவமும் தமிழும்	22PTA1DSE1C						
Total				30	23	-	-	-	500
II	Core Course– V (CC)	தொல்காப்பியம் – சொல்லதிகாரம் (தெய்வச்சிலையார் உரை)	22PTA2CC5	6	5	3	25	75	100
	Core Course –VI (CC)	புனைகதையும் உரைநடையும்	22PTA2CC6	6	5	3	25	75	100
	Core Course - VII (CC)	காப்பியங்கள்	22PTA2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. சிற்றிலக்கியம்	22PTA2CCC1A	6	4	3	25	75	100
		B. திருமந்திரம்	22PTA2CCC1B						
		C. பாரதியம்	22PTA2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. ஆராய்ச்சி நெறிமுறைகள்	22PTA2DSE2A	6	3	3	25	75	100
		B. கல்வெட்டியல்	22PTA2DSE2B						
		C. வைணவமும் தமிழும்	22PTA2DSE2C						
	Internship	Internship	22PTA2INT	-	2	-	-	100	100
Total				30	24	-	-	-	600

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	நூன்மரபு, மொழிமரபு (1-82 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	பிறப்பியல், புணரியல் (83-142 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	தொகைமரபு, உருபியல் (143-202 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
IV	உயிர்மயங்கியல், புள்ளிமயங்கியல் (203-382 நூற்பாக்கள்) (383 – 405 நீங்கலாக)	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	குற்றியலுகரப் புணரியல் (406-483 நூற்பாக்கள்)	10	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல முகர, ளகர ஈற்றுப்புணர்ச்சி (383 – 405 நூற்பாக்கள்)	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பாட நூல் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	நச்சினார்க்கினியர் (உ.ஆ.)	தொல்காப்பியம் - எழுத்ததிகாரம்	கழக வெளியீடு, சென்னை	1965

பார்வை நூல் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	சண்முகம், செ.வை.	எழுத்திலக்கணக் கோட்பாடு	உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை	2012

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

முனைவர் மா. ஆசியாதாரா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கவிதை - குயில் பாட்டு - பாரதியார், குடும்ப விளக்கு - பாரதிதாசன்	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	கவிதை - சுட்டுவிரல் - அப்துல் ரகுமான், கண்ணீர்ப் பூக்கள் - மு.மேத்தா	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	கவிதை, நாடகம் - இன்னொரு தேசியகீதம் - வைரமுத்து, வேலைக்காரி - அறிஞர் அண்ணா	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6௭
IV	நாடகம் - மனோன்மணியம் - பேராசிரியர் சுந்தரம்பிள்ளை	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	நாடகம் - ஆதி அத்தி - பெ.தூரன், ஆதிரை - சிற்பி	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கவிதை - வீரத்தாய் - பாரதிதாசன்	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பாட நூல்கள் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	பாரதியார்	பாரதியார் கவிதைகள்	மணி வாசகர் பதிப்பகம்	2000
2.	பாரதிதாசன்	குடும்ப விளக்கு	மணி வாசகர் பதிப்பகம்	1992
3.	அப்துல் ரகுமான்	சுட்டுவிரல்	நேஷனல் பப்ளிஷர்ஸ் 2 வடக்கு உஸ்மான் சாலை திருநகர் சென்னை	2018
4.	மு.மேத்தா	கண்ணீர்ப் பூக்கள்	குமரன் பதிப்பகம் திருநகர் சென்னை	2009
5.	வைரமுத்து	இன்னொரு தேசியகீதம்	சூர்யா இலக்கியம் சென்னை	2013
6.	அறிஞர் அண்ணா	வேலைக்காரி	பூம்புகார் பிரசுரம் பிரஸ் 63 பிராட்வே சென்னை	1980
7.	பேராசிரியர் சுந்தரம்பிள்ளை	மனோன்மணியம்	நறுமலர்ப் பதிப்பகம் சென்னை	1992
8.	பெ.தூரன்	ஆதி அத்தி	நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை	2019
9.	சிற்பி	ஆதிரை	கோலம் வெளியீடு பொள்ளாச்சி	2003
10.	பாரதிதாசன்	பாரதிதாசன் கவிதைகள் (வீரத்தாய்)	மணிவாசகர் பதிப்பகம்	2000

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

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முனைவர் தி. மணிமொழி

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

Semester I	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PTA1CC3	சமய இலக்கியமும் சித்தர் இலக்கியமும்	CORE	6	5

நோக்கம்

1. சமய இலக்கியங்கள் வழி பல்வேறு சமயங்களின் தனித்தன்மையை அறியச் செய்தல்.
2. சமய இலக்கியங்கள் வாயிலாக சமுதாய நிலையை அறியச்செய்தல்
3. மனித உடல் உள்ளம் சார்ந்த சித்தர்களின் கருத்துக்களைக் கற்பித்தல்
4. மனித வாழ்வியல் குறித்த சிந்தனைகளை எடுத்துரைத்தல்

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	சமய இலக்கியத்தை மதிப்பீட்டு ஒருமைபாட்டுச் சிந்தனைகளை வகைப்படுத்தி இலக்கியங்களை ஆராய்ந்து அறிதல்	K3, K4, K5
CO2	அக்காலகட்ட மொழிப்பயன்பாட்டினை ஆராய்ந்து அதன் வழி மொழிப்பயன்பாட்டினை பகுத்தாய்தல்	K4, K5
CO3	சமய இலக்கியங்களின் வழி மனிதகுல மேம்பாட்டிற்கான உயரிய பண்புகளை பகுத்தாய்ந்து விழுமியங்களை வாழிவில் பயன்படுத்துதல்	K4, K5
CO4	சமயங்களுக்கு இடையேயான தனித்தன்மையை ஆராய்ந்து இறைக்கோட்பாடுகளையும், கொள்கைகளையும் மதிப்பிடல்	K5, K6
CO5	சமய இலக்கியங்கள் மற்றும் சித்தர் பாடல்கள் வழி சமுதாய நிலையை ஆராய்ந்து அறிதல்	K5, K6

Mapping with PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	3	3	2	2
CO2	1	3	1	3	3	3	3	2	2	2
CO3	3	3	3	3	3	3	3	3	2	2
CO4	3	3	2	3	3	3	3	2	2	2
CO5	3	3	2	3	2	3	3	2	2	2

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சைவம் - திருஞானசம்பந்தர் - முதல் திருமுறை - திருச்சிராப்பள்ளி திருப்பதிகம் "நன்றுடையானை" (11 பதிகங்கள்), திருநாவுக்கரசர் - நான்காம் திருமுறை - திருஅங்கமாலை "தலைவணங்காய்" (12 பதிகங்கள்), சுந்தரர் - ஏழாம் திருமுறை - திருத்தொண்டர்தொகை - "தில்லைவாழ் அந்தணர்" (11 பதிகங்கள்), மாணிக்கவாசகர் - சிவபுராணம் முழுவதும்	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	வைணவம் - ஆண்டாள் - திருப்பாவை (30 பாசுரங்கள்), பெரியாழ்வார் - மூன்றாம் திருமொழி - கண்ணன் தாலாட்டு (10 பாசுரங்கள்), தொண்டரடிப் பொடியாழ்வார் - திருப்பள்ளியெழுச்சி (10 பாசுரங்கள்)	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	இஸ்லாமியமும் கிறித்தவமும் - மு. மேத்தா - நாயகம் ஒரு காவியம் - கொள்கைப் போர்க்களம், மனையறம், அரவணைக்கும் கரங்கள், வரவேற்கும் இயற்கை, போர் முரசு, கண்ணதாசன் - இயேசு காவியம் - மலைப் பொழிவு	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
IV	சித்தர் பாடல்கள் - பாம்பாட்டிச் சித்தர் - பொருளாசை விலக்கல் (9 பாடல்கள்), குதம்பைச் சித்தர் - 1 முதல் 20 பாடல்கள், சிவவாக்கியர் - பாடல் எண் 43 முதல் 50, 52 முதல் 58 (15 பாடல்கள்), பட்டினத்தார் - தாயாருக்குத் தகன கிரியை செய்யும்போது பாடியது (10 பாடல்கள்)	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	திருமந்திரம் - முக்குற்றம் - முப்பலம் - முப்பரம் - முத்துரியம் - மும்முத்தி - முச்சொருபம் - முக்கரணம் - முச்சூனிய தொந்தத் தசி - முப்பாழ் (51 பாடல்கள்)	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல திருஞானசம்பந்தர் - முதல் திருமுறை - திருப்பிரம்மபுரம் திருப்பதிகம் "தோடுடைய செவியன்" (11 பதிகங்கள்), குலசேகர ஆழ்வார் - பெருமாள் திருமொழி - "ஊனேறு செல்வத்து" (11 பாடல்கள்)	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
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பார்வை நூல்

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	புலவர் வீ. சிவஞானம் (உ.ஆ.)	திருஞானசம்பந்தர் தேவாரம் மூலமும் உரையும்	விஜயா பதிப்பகம், சென்னை	2016
2.	புலவர் வீ. சிவஞானம் (உ.ஆ.)	திருநாவுக்கரசர் தேவாரம் மூலமும் உரையும்	விஜயா பதிப்பகம், சென்னை	2015
3.	புலவர் வீ. சிவஞானம் (உ.ஆ.)	சுந்தரர் தேவாரம் மூலமும் உரையும்	விஜயா பதிப்பகம், சென்னை	2011
4.	கா. சுப்பிரமணிய பிள்ளை (உ.ஆ.)	திருவாசகம் மூலமும் உரையும்	ராமையா பதிப்பகம், சென்னை	2014
5.	நாராயண வேலுப்பிள்ளை (உ.ஆ.)	நாலாயிர திவ்ய பிரபந்தம்	சாரதா பதிப்பகம், சென்னை.	2008
6.	மு. மேத்தா	நாயகம் ஒரு காவியம்	ரஹ்மத் பதிப்பகம், சென்னை.	பிப்ரவரி 2011
7.	கண்ணதாசன்	இயேசு காவியம்	கண்ணதாசன் பதிப்பகம், சென்னை.	2014
8.	இளமுனைவர் தமிழ்ப்பிரியன் (உ.ஆ.)	சித்தர் பாடல்கள் (மூலமும் உரையும்)	கற்பகம் புத்தகாலயம், சென்னை.	2019

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-l0900-html-l0900kan-118186>

முனைவர் ப. சசிரேகா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	உரைஅறிமுகம் - உரையின் தோற்றமும் வளர்ச்சியும் - உரையாசிரியர்கள் - உரையின் வகைகள் - உரையும் உரைநடையும் - உரையும் திறனாய்வும்	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	இலக்கிய உரையாசிரியர்கள் - பத்துப்பாட்டு உரைகள்-எட்டுத்தொகை உரைகள் - பதினெண் கீழ்க்கணக்கு உரைகள் - புதிய உரைகள்	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	காப்பிய உரையாசிரியர்கள் - அரும்பத உரையாசிரியர்கள் - அடியார்க்கு நல்லார் - சீவக சிந்தாமணி உரை - கம்பராமாயண உரை - நாலாயிர திவ்யப்பிரபந்த வியாக்யானங்கள்	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
IV	சமய நூல் உரையாசிரியர்கள் - திருமுறை உரைகள் - சைவ சித்தாந்த உரைகள் - சைவ சாத்திர உரைகள்.	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	பதிப்பாசிரியர்கள் - மேற்கோள் பாடல்கள் - இடைச்செருகல் - உரையில்லாத நூல்கள் - மறைந்து போன உரை நூல்கள்	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பத்தொன்பதாம் நூற்றாண்டு உரையாசிரியர்கள் - இருபதாம் நூற்றாண்டு உரையாசிரியர்கள்	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பாட நூல் :

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	மு.வை.அரவிந்தன்	உரையாசிரியர்கள்	மணி வாசகர் பதிப்பகம்	1995

பார்வை நூல்கள் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1.	ஆ.மணி	குறுந்தொகை உரைநெறிகள்	தமிழன்னை ஆய்வகம் புதுச்சேரி	2011
2.	இ.சுந்தரமூர்த்தி	பரிமேலழகர் திருக்குறள் உரைத்திறன்	மெய்யப்பன் பதிப்பகம் சிதம்பரம்	1977

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

<https://www.tamilvu.org/ta/library-I0900-html-I0900kan-118186>

முனைவர் மு. ஜெயலெட்சுமி

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

Semester I	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PTA1EC1A	கணினியும் இணையமும்	ELECTIVE	6	3

நோக்கம்

1. கணினியின் வரலாற்றையும் செயல்பாட்டையும் விளக்குதல்
2. கணினித்தமிழின் வளர்ச்சிநிலைகளை அறியச்செய்தல்
3. இணையத்தின் வரலாற்றினையும் முக்கியத்துவத்தினையும் உணர்த்துதல்
4. இணையத்தில் தமிழ்மொழி பெற்றுள்ள செல்வாக்கினைக் கண்டறிதல்

COURSE OUTCOMES

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	கணினியின் வரலாற்றையும் செயல்பாட்டையும் அறிந்து, கணினி மொழித்திறனில் மேம்பாடு அடைதல்	K3
CO2	பல்வேறு தமிழ் எழுத்துருக்களை அறிந்து தட்டச்சு செய்யும் பயிற்சியைப் பெறுதல்	K4
CO3	கணினியில் கோப்பு உருவாக்கம் மற்றும் காட்சிவில்லை வடிவமைக்கும் முறையைக் கற்று ஆய்வேடு வடிவமைத்தல்	K5
CO4	போட்டித் தேர்வுகளுக்குப் பங்கேற்கும் வகையில் கணினித்தமிழ் குறித்த ஆழ்ந்த அறிவுபெறுதல்	K6
CO5	பணிச்சூழலுக்கு ஏற்ற வகையில் தகவல் தொடர்பு சாதனைங்களை கையாளும் திறன் பெறுதல்	K5

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	3	3	3	1	1	3	3	3
CO2	1	1	3	3	3	3	1	3	3	3
CO3	1	2	3	3	3	1	1	3	3	3
CO4	1	2	3	3	3	3	1	3	3	3
CO5	1	1	3	3	3	3	2	3	3	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>கணினியின் வரலாறு - வளர்ச்சி - வகைப்பாடு - கட்டமைப்பு - செயல்படும் விதம்- வன்பொருள், மென்பொருள் - வகைகள் - கணினியும் பயன்பாடும் - கணினியும் தமிழும் - MS.WORD அறிமுகம் - தமிழ் எழுத்துகள், ஒருங்குறியீட்டின் சிறப்பு எழுத்துருக்கள், எழுத்துரு உள்ளீடு - ஆவணம் தயாரித்தல்- ஆய்வேடு தயாரித்தல் - பக்க அமைப்பு, வரி இடைவெளி, பக்க ஒழுங்கு, பக்க எண்ணிடல், அட்டவணையிடுதல் - அச்செடுக்கும்போது கவனத்தில் கொள்ள வேண்டியவை.</p>	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	<p>MS. EXCEL அறிமுகம் - தமிழ்எழுத்துரு உள்ளீடு - கணக்கிடும் முறை - அட்டவணை தயாரித்தல், வரைபடம் தயாரித்தல் - வகைகள் - உள்ளிடும் முறை - MS. Powerpoint அறிமுகம் - திரைப்படங்களை வகைகள் - தேர்ந்தெடுத்தல் - எழுத்துருக்கள் உள்ளீடு - வண்ணங்கள் தேர்ந்தெடுத்தல் - படங்கள், வரைபடங்கள், அட்டவணைகள் தயாரித்து உள்ளிடும் முறைகள் - அனிமேசன்ஸ் - எஃபெக்ட் - திரைப்படங்களை தயாரிக்கும் முறை - காட்சிப்படுத்தல்.</p>	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	<p>சொற்பொருள் - வரலாறு - முதல் இணையதளம் - தமிழில் முதல் இணையதளம்- இணையத்தை வழிநடத்துவோர் - பயனர் வகைமை - கல்வித்திட்டம் - பயணியர் தமிழ் - இணைய வழித் தேர்வு - பாட வடிவமைப்பு - கணினித்தமிழ் பணிகள் - மின்னூல் - மின்னகராதி - மின் நூலகம் - இலக்கண</p>	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

	நூல்கள் - இலக்கிய நூல்கள் - சிற்றிலக்கியங்கள் - நூலகம் .நெட்.			
IV	பிட் முறை - தமிழ்நெட் 97 - தமிழ் நெட் 99 - திண்ணை வார்ப்பு - பதிவுகள் - மரத்தடி - தமிழ் நெட் - மின் செய்தித்தாள் - மின்னிதழ்கள் - இணைய இதழ்களின் நிறைகுறைகள் - வலைப்பூவும், இணையதளமும் - உருவாக்கம்.	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	சமூக வலைத் தளங்கள் - தமிழ் வலையதள முகவரிகள் - தரவிறக்கமும், தரவேற்றமும் - தேடுபொறி - உலாவி - மின்னஞ்சல் - மின்னஞ்சல் முகவரி தயாரிக்கும் முறை - பயன்படுத்தும் விதம் - இணையவழிக் கல்வி - இணைய வானொலி - இணைய தொலைக்காட்சி - குறுஞ்செயலிகள் - தகவல்களை வழங்குபவை, விக்கிபீடியா.	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல சிறப்புக் குறியீடுகள் - படமிடுதல் - திரைப்படகையை வரிசை மாற்றி அமைக்கும் முறை - உரைநடை - அகராதிகள் - கலைச் சொற்கள் - சுவடிக் காட்சியகம் - தமிழில் வலைப்பூக்கள் - தமிழ்ப்பூக்கள் - மனிதவள மேம்பாட்டுத்துறை.	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பாட நூல்

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	முனைவர் துரையாசன்	இணையமும் இனிய தமிழும்	இசைப்பதிப்பகம், கும்பகோணம்	2009
2	முனைவர் இல. சுந்தரம்	கணினித் தமிழ்	விகடன் பிரசுரம், சென்னை	2015

பார்வை நூல்கள்

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	துரை. மணிகண்டன்	தமிழ்க் கணினி இணையப் பயன்பாடுகள்	கமலினி பதிப்பகம், தஞ்சாவூர் - 102	டிச. 2012
2	இராதா செல்லப்பன்	தமிழும் கணினியும்	கவிதை அமுதம் வெளியீடு, திருச்சி - 21	நவ. 2011
3	மு.பொன்னவைக்கோ	இணையத் தமிழ் வரலாறு	பாரதிதாசன் பல்கலைக்கழகம், திருச்சி - 24	2010

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம், காணொளி காட்சி

முனைவர் ப. சசிரேகா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

Semester I	Internal Mark: 25	External Mark: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PTA1EC1B	மக்கள் தகவல் தொடர்பியல்	ELECTIVE	6	3

நோக்கம்

1. தகவல் தொடர்பின் வளர்ச்சி நிலைகளை அறியச் செய்தல்.
2. ஊடக வேலை வாய்ப்புகளைப் பற்றி உணர்த்துதல்.
3. மாணவர்கள் வானொலி, தொலைக்காட்சிகளில் நிகழ்ச்சிகள் தயாரித்து வழங்குதல், பணி வாய்ப்பு பெறுதல்

COURSE OUTCOMES

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	தகவல் தொடர்பின் முக்கியத்துவத்தினைக் கண்டறிதல்	K3
CO2	தகவல் பரிமாற்றத்திற்கு பயன்படும் தகவல் தொடர்பு சாதனங்களின் வரலாறு குறித்து விவரித்தல்	K4
CO3	தகவல் தொடர்பு சாதனங்களின் அமைப்பு மற்றும் அவை செயல்படும் விதத்தினை ஆராய்ந்தறிதல்	K3
CO4	சமூக வளர்ச்சிக்குத் தகவல் தொடர்பு சாதனங்களின் பங்களிப்பினை இணைத்தறிதல்	K4
CO5	பணிச்சூழலுக்கு ஏற்ற வகையில் தகவல் தொடர்பு சாதனங்களை கையாளும் திறன் பெறுதல்	K5

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	3	1	2	3	3	3
CO2	1	1	3	3	3	1	2	1	1	3
CO3	3	3	3	3	3	1	1	3	3	3
CO4	3	2	3	3	3	1	1	3	3	3
CO5	1	1	3	3	3	3	2	3	3	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	தொடர்பியல் - விளக்கம் - தகவல் தொடர்பியலின் இலக்கணம் - மக்கள் தொடர்பியல் விளக்கம் - மக்கள் தொடர்பு - அறிஞர்கள் கருத்து - தகவல் தொடர்பின் இன்றியமையாமை - தொடர்புச் சாதனங்களின் வளர்ச்சி - தொடர்பியல் சாதனங்களின் பாகுபாடுகள் - மரபுவழி, அச்சுவழி - வேறுபாடுகள் - மின்வழி	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
II	தகவல் தொடர்பியல் பணிகள் - அறிவித்தல் - கற்பித்தல் மகிழ்வித்தல் மக்கள் தகவல் தொடர்புச் சாதனங்களின் தரக்கட்டுப்பாடு வழிகாட்டும் நெறிகள் - நேர்மை - நம்பகத்தன்மை - குறிக்கோள் போன்றவை	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
III	வானொலி, தொலைக்காட்சி - வரலாறு, அமைப்புமுறை - நிர்வாகம் - நிகழ்ச்சி வழங்கப்படும் முறை - ஒலி, ஒளிபரப்பு நிகழ்ச்சிகள் - சமுதாய மாற்றத்தில் தொலைக்காட்சியின் பங்கு - தனியார் தொலைக்காட்சிகளின் பரவல் - வானொலி சுதந்திரம்	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
IV	திரைப்பட வரலாறு - வளர்ச்சி - சமூகத்தில் ஏற்படுத்தும் தாக்கம் - இன்றைய தமிழ்த் திரைப்படத்தின் போக்கு - சமூகத்தின் மீது திரைப்படத்தின் மதிப்பு - பாதிப்பு - திரைப்படத் தணிக்கைகள்	15	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
V	தகவல் தொடர்பியலில் அறிவியல் தொழில் நுட்பம் - பயன்பாடு - கருவிகள் - கணிப்பொறி - இணையம் - இணைய தேடுபொறிகள் - செயற்கைக் கோள் - தொலைவரி அச்சு - தொடர்பியலிலும்,	20	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

	இதழியலிலும் கணிப்பொறியின் பயன்கள் - மக்கள் தொடர்பு அலுவலரின் பணிகள்			
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல தொலைக்காட்சியின் நிறைகள், குறைகள் - தொடர்பியலில் சாதனங்களும் மக்கள் கருத்தும்	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பார்வை நூல்கள்

வ.எ.	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	மா.பா. குருசாமி	இதழியல் கலை	குரு - தேமொழி, திருச்செந்தூர்	2017
2	முனைவர் கி. இராசா	மக்கள் தகவல் தொடர்பியல்	பாவணார் ஏடகம், சென்னை	2003
3	அ.ஆலிஸ்	மக்கள் தகவல் தொடர்புக்கலை	மதுமதி வெளியீடு, திருச்சி	1995

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

முனைவர் இர. கீர்த்தனா

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

பாடக்குறியீடு	பாடம்	category	L	T	P	Credit
22PTA1DSE1C	சைவமும் தமிழும்	III	86	4	-	3

நோக்கம்

1. சைவசமயத்தின் சிறப்பினை மாணவர்கள் அறிதல்.
2. சைவசமயத்திற்கும் தமிழுக்கும் உள்ள தொடர்பு பற்றிய அறிவு பெறுதல்

COURSE OUTCOMES

CO NO.	CO STATEMENT	KNOWLEDGE LEVEL
CO1	சைவ இலக்கியங்களை மதிப்பிட்டு அன்றைய சமூக சிந்தனைகள் மற்றும் மொழித்திறனை வகைப்படுத்தி அறிதல்	K3
CO2	சைவ இலக்கியங்களில் உள்ள கொள்கை, கோட்பாடுகளைப் பகுத்தாய்தல்	K4
CO3	சைவ இலக்கியங்களில் உள்ள வாழ்வியல் விழுமியங்களைப் பகுத்துணர்ந்து மனிதகுல மேம்பாட்டிற்குப் பயன்படுத்துதல்	K5
CO4	சைவ இலக்கியங்களின் தனித்தன்மையை ஆராய்ந்து விமர்சிக்கும் திறன் பெறுதல்	K5
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் சைவ இலக்கியங்கள், உரைகள் ஆகியவற்றை ஆய்ந்தறிதல்	K6

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	இந்தியச் சமயங்கள் - தமிழகச் சமயங்கள், சைவம் தோற்றம், உட்பிரிவுகள் சிவ வழிபாடு, தொன்மை, காலந்தோறும் சிவவழிபாட்டின் வளர்ச்சி, சங்க காலம் முதல் - இக்காலம் வரை.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	சிவன் சொற்பொருள் விளக்கம் - சிவ வடிவங்கள், சிவத்தலங்கள், சிவ தத்துவங்கள் - சிவ விரதங்கள், சிவபுராணங்கள், சிவ சின்னங்கள், சிவ வழிபாட்டு முறைகள்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	அருளாளர்களும் படைப்புகளும், திருஞானசம்பந்தர், திருநாவுக்கரசர், சுந்தரர், மாணிக்கவாசகர், காரைக்காலம்மையார், திருமூலர், நக்கீரர், சேக்கிழார், தியார், தாயுமானவர், குமரகுருபரர், சிவப்பிரகாசர், வள்ளலார்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	சாத்திரமும் ஆசிரியர்களும், மெய்க்கண்டார், அருணந்தி, சிவாசாரியார், மறைஞான சம்பந்தர் - உமாபதி சிவாசாரியார், சைவ சமயக் கொள்கைகள் - பதிக் கொள்கை, பசுக் கொள்கை, பாசக் கொள்கை, சிவசக்தித் தொடர்பு - ஆன்மா	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	சமயப் பணிகள், சைவத் திருமடங்கள், சைவ சமய நூலாசிரியர்கள், சைவ சமய மாநாடுகள், கருத்தரங்குகள், சைவ சமய வெளியீடுகள், சமய இதழ்கள், திருவிழாக்கள், பண்டிகைகள், சைவ சமய ஆய்வுகள்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	சுய கற்றல் (இப்பகுதி பருவத் தேர்வுக்கு உரியதல்ல)சைவ சமய வரலாறு, தோற்றம் வளர்ச்சி		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பார்வை நூல்கள்

1. ந.சுப்புரெட்டியார், 2001, சைவமும் தமிழும், திருநெல்வேலி தென்னிந்திய சைவ சித்தாந்த நூற்பதிப்புக்கழகம், திருநெல்வேலி.
2. டாக்டர். எம். நாராயண வேலுப்பிள்ளை, 2011, பன்னிரு திருமுறைகள் ஓர் அறிமுக கையேடு, நர்மதா பதிப்பகம்.

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழு விவாதம்

முனைவர் ச. இராமலட்சுமி

பாடப்பகுதி வடிவமைப்பாளர்

துறைத்தலைவர் கையொப்பம்

CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	கிளவியாக்கம் (1-59 நூற்பாக்கள்)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	வேற்றுமையியல் (60-80 நூற்பாக்கள்), வேற்றுமை மயங்கியல் (81-113 நூற்பாக்கள்), விளிமரபு (114-132 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	பெயரியல் (150-190 நூற்பாக்கள்) வினையியல் (191-244 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	இடையியல் (245-291 நூற்பாக்கள்) உரியியல் (292-391 நூற்பாக்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	எச்சவியல் (392-452 நூற்பாக்கள்)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	சுய கற்றல் (இப்பகுதி பருவத் தேர்வுக்கு உரியதல்ல) விளிமரபு (133-149 நூற்பாக்கள்)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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பாட நூல் :

- தெய்வச்சிலையார் (உ.ஆ.), (1984), தொல்காப்பியம் சொல்லதிகாரம், தமிழ்ப் பல்கலைக்கழகம், தஞ்சாவூர்.

பார்வை நூல்கள் :

- சண்முகம், செ.வை., (2012), சொல்லிலக்கணக் கோட்பாடு 1,2,3, உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை.
- சேனாவரையர் (உ.ஆ.), (1997), தொல்காப்பியம் சொல்லதிகாரம், கழக வெளியீடு, சென்னை.

கற்பித்தல் முறைகள்

கரும்பலகை, குழு விவாதம், கலந்தாய்வு, திட்டக் கட்டுரை, வினாடி வினா.

Web Resources

<https://www.tamilvu.org/ta/library-I0100-html-I0100tsv-116832>

Semester II	Internal Marks : 25	External Mark 75		
COURSE CODE	COURSE TITLE	Category	Hrs/Week	Credits
22PTA2CC6	புனைகதையும் உரைநடையும்	CORE	6	5

நோக்கம்

1. புனை கதையின் அமைப்பினையும் களங்களையும் அறிமுகம் செய்து விளக்குதல்
2. நவீனத் தமிழ்கதைகளின் போக்குகளை வேறுபடுத்திக் காட்டுதல்
3. உரைநடையின் பன்முகத்தன்மையை வகைப்படுத்துதல்
4. உரைநடை இலக்கியம் காலந்தோறும் பெற்ற மாற்றங்களை வேறுபடுத்தி காட்டுதல்

COURSE OUTCOME

இப்பாடத்தினைப்பயில்வதால்மாணவியர்பெறும் திறன்கள்

CO No.	CO Statement	Knowledge Level
CO1	தமிழ்ப் புத்திலக்கியங்களின் சிறப்புகளைக் கண்டறிந்து அதன் இலக்கியக் கூறுகளை வகைப்படுத்தி பகுத்தாய்தல்	K4 K5
CO2	நவீன இலக்கியங்களின் சிறப்புகளைத் தெரிந்து இலக்கிய நுட்பங்களையும் கட்டமைப்புகளையும் பட்டியலிடுதல்	K5
CO3	புத்திலக்கியங்களின் தன்மையைப் பகுத்தாய்ந்து அதன் வரையறைகளையும் வகைபாடுகளையும் மதிப்பிடல்	K6
CO4	நவீன இலக்கியத்தின் புதிய உத்திமுறைகளை சிறுகதை, புதினம், நாடகஇலக்கியங்களில் பொருத்தி விளக்குவது மற்றும் அவ்விலக்கியங்களின் கட்டமைப்பை பிற இலக்கியங்களோடு ஒப்பீடு செய்வது	K3 K4
CO5	நவீன இலக்கியங்களின் உட்கூறுகளை மாணவர்களை உணரச் செய்து மாறுபட்ட புதிய இலக்கியங்களை உருவாக்கி அதனை ஆய்வு செய்ய அவர்களை ஆயத்தப்படுத்துதல்	K5 K6

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	3	3	3	2	3	3	3	3
CO4	3	3	2	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
1	அறியப்படாததமிழகம் – தொ. பரமசிவன்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
2	புதியஉரைநடை -முனைவர்மா. இ ராமலிங்கம்	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
3	சிவப்புக்கழுத்துடன்ஒருபச்சைபறவை - அம்பை	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
4	சுடர்மணிகள் - தொகுப்பாசிரியர்முனைவர். சி. சேதுராமன்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
5.	செந்நெல் – சோலைசுந்தரபெருமாள்	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
6.	(சுயகற்றல்) இப்பகுதிபருவத்தேர்விற்குஉரியதல்ல வேரும் விழுதும் – தொகுப்பு இந்திரன்		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

பாடநூல்கள்

தொ. பரசிவன், (2022) அறியப்படாததமிழகம், நிமிர்பதிப்பகம், 5/3

பார்த்தசாரதிபேட்டைதெரு, அண்ணாசாலை, தேனாம்பேட்டை, சென்னை-600086

முனைவர்மா.இ ராமலிங்கம், (2013) புதியஉரைநடை,

மீனாட்சிபுத்தகநிலையம்மயூராவளாகம்மதுரை – 625001.

அம்பை, (2022) சிவப்புக்கழுத்துடன்ஒருபச்சைப்பறவை, காலச்சுவடுபப்ளிகேஷன்ஸ்

(பி) லிட்., 669 கே.பி.சாலை, நாகர்கோவில் – 629001.

முனைவர்சி. சேதுராமன்,(2010) சுடர்மணிகள், பாவைபப்ளிகேஷன்ஸ், 142,

ஜானிஜான்கான்சாலை, இராயப்பேட்டை, சென்னை-600014

சோலைசுந்தரபெருமாள், (2008) செந்நெல், நியுசெஞ்சுரிபுக்ஹவுஸ். ,

இந்திரன் (தொகுப்பாசிரியர்)(2021), வேரும்விழுதும், எண் :1055B, முனுசாமிசாலை,

கே.கே. நகர் – மேற்கு, சென்னை- 600078

கற்பித்தல்முறைகள்

கலந்தாய்வு, வினாடிவினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

1. <https://www.panuval.com/ariyapadatha-tamizhagam>

2. <https://www.udumalai.com/puthiya-urainadai.htm>

3. <https://www.amazon.in/%E0%AE%9A%E0%AE%BF%E0%AE%B5%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AF%81%E0%AE%95%E0%AF%8D-%E0%AE%95%E0%AE%B4%E0%AF%81%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AF%81%E0%AE%9F%E0%AE%A9%E0%AF%8D-%E0%AE%AA%E0%AE%9A%E0%AF%8D%E0%AE%9A%E0%AF%88%E0%AE%AA%E0%AF%8D-Sivappu-Kazhuthudan/dp/B07NRX18YC>

5. <https://www.panuval.com/sennel-10003216>

பாடப் பகுதி வடிவமைப்பாளர்;

முனைவர்தி.மணிமொழி

காப்பியங்கள்

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	சிலப்பதிகாரம் மதுரைக்காண்டம் (10 – 13 காதைகள்) மணிமேகலை (16 – 20 காதைகள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	கம்பராமாயணம் – மந்தரை சூழ்ச்சிப்படலம் (84 பாடல்கள்) வில்லிபாரதம் – விராடபருவம் – நாடு கரந்துறை சருக்கம்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	பெரியபுராணம் – பூசலார் நாயனார் புராணம் திருவிளையாடல் புராணம் – பிட்டுக்குமண் சுமந்தபடலம் கந்தபுராணம் – நகர் புகு படலம் (75 பாடல்கள்)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	இரட்சண்ய யாத்திரிகம் – ஆதி பருவம் துயில் உணர்த்து படலம் சீறாப்புராணம் -உடும்பு பேசிய படலம் (40 பாடல்கள்)	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	ராவணகாவியம் – அரசியல் படலம் (80 பாடல்கள்) நாயகம் ஒரு காவியம் – தொடக்க உரை முதல் மலர்ந்தது மார்க்கம்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல காப்பியங்கள் இலக்கணம் - தோற்றம் வளர்ச்சி	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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பார்வை நூல்கள் :

வ.எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	மாணிக்கவாசகன். ஞா (உ.ஆ)	சிலப்பதிகாரம்	உமா பதிப்பகம் சென்னை	2010
2	வேங்கடசாமி (உ.ஆ)	மணிமேகலை	கழக வெளியீடு சென்னை	1985
3	ராம சுப்பிரமணியம் வ.த (உ.ஆ)	கம்பராமாயணம்	திருமகள் பதிப்பகம் மண்ணடி சென்னை	1998
4	நாராயண வேலுப்பிள்ளை, துரை ராஜாராம், ராம சுப்பிரமணியம் வ.த (உ.ஆ)	வில்லிபாரதம்	பூம்புகார் பதிப்பகம் சென்னை	2013
5	மகாமதி சதாவதாணி கே.பி. செய்குதம்பி பாவலர் (உ.ஆ)	சீறாப்புராணம்	சாரதா பதிப்பகம் சென்னை	2015
6	வீரமாமுனிவர்	தேம்பாவணி	சாரதா பதிப்பகம் சென்னை	2014

7	மேத்தா.மு	நாயகம் ஒரு காவியம்	ரஹமத் பதிப்பகம் சென்னை	2011
8	வெற்றியழகன் .ந	இராவண காவியம்	சாரதா பதிப்பகம் சென்னை	2018
9	ராம சுப்பிரமணியம் வ.த	கந்தபுராணம்	திருமகள் பதிப்பகம் மண்ணடி சென்னை	2009

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

www.sangatamil.com

www.tamilvu.org

www.noolaham.in

www.projectmadurai.org

www.chennailibrary.com

<http://kalithogai.blogspot.in>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் இர.கீர்த்தனா

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	தமிழ் விடு தூது	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	குற்றாலக் குறவஞ்சி	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	கலிங்கத்துப்பரணி (கடைத் திறப்பு நீங்கலாக)	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	திருவரங்கக் கலம்பகம்	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	சேக்கிழார் பிள்ளைத் தமிழ் – முதல் மூன்று பருவங்கள் மட்டும் ஏரெழுபது	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல சிற்றிலக்கியத் தோற்றமும் வளர்ச்சியும்	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
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பாட நூல்கள் :

1. கதிர்முருகு (உரை), (2018), தமிழ்விடுதூது மூலமும் உரையும், சாரதா பதிப்பகம், 11ம் பதிப்பு, சென்னை - 14
2. முத்திராம மூர்த்தி(உ.ஆ), (2015), குற்றாலக் குறவஞ்சி, சாரதா பதிப்பகம், சென்னை - 14.
3. புலியூர் கேசிகன், (2014), கலிங்கத்துப்பரணி, பாரி நிலையம், சென்னை
4. சத்திய பாமா காமேஸ்வரன் (பதிப்பாசிரியர்), (2007), பிள்ளைப் பெருமாள் ஐயங்கார், திருவரங்கக் கலம்பகம், சரஸ்வதி நூலகம்
5. முனைவர். ச. சகுந்தலா, சேக்கிழார் பிள்ளைத் தமிழ், மூலமும் உரையும், சாரதா பதிப்பகம், சென்னை -14
6. கதிர்முருகு (உரை), (2014), கம்பரின் ஏரெழுபது மூலமும் உரையும், சீதை பதிப்பகம், 4ம் பதிப்பு. சென்னை - 5.

பார்வை நூல்கள்

1. ஜெயராமன்.ந.வீ., (2008), சிற்றிலக்கியத் தோற்றமும் வளர்ச்சியும், சாரதா பதிப்பகம், 4ம் பதிப்பு, சென்னை - 17.
2. பொன்னுசாமி.மு, (2004), தமிழ்ச் சிற்றிலக்கிய வரலாறு, இந்து பதிப்பகம், கோயம்புத்தூர்.

இணையதளமுகவரிகள்

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கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடப்பகுதி வடிவமைப்பாளர்

திருமதி பொ.அபிராமி

Semester II	Internal Marks : 25	External Marks : 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22PTA2CCCIB	திருமந்திரம்	CCC	6	4

நோக்கம் :

- திருமூலரின் வரலாறு மற்றும் திருமந்திரம் பற்றிய அடிப்படை அறிவைப் பெறுவர்.
- நிலையாமை மற்றும் அறத்தின் மேன்மையை உணர்ந்து காயசித்தி உபாயங்களைக் கண்டறிவர்.
- திருமந்திரம் வழி வாழ்வியல் நெறிகளை அறிவர்.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive Level
CO1	திருமந்திரத்தில் உள்ள சமூக சிந்தனைகளை பகுத்தாராய்ந்து திருமூலரின் மொழித் திறனை அறிதல்	K5
CO2	திருமூலரின் இறைக் கொள்கை மற்றும் அறக் கோட்பாடுகளை மதிப்பிடும் திறன் பெறுதல்	K5, K6
CO3	திருமந்திரம் கூறும் வாழ்வியல் விழுமியங்களை பகுத்துணர்தல்	K3 K4
CO4	திருமந்திரத்தைக் கற்றுணர்ந்து தனிமனித ஒழுக்கம், ஆளுமைத் திறனில் மேம்படல்	K3
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் திருமந்திரம் குறித்த ஆழ்ந்த அறிவைப் பெறுதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	4	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	திருமூலர் வரலாறு - திருமந்திரத் தொகைச் சிறப்பு	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	யாக்கை நிலையாமை- செல்வம் நிலையாமை - இளமை நிலையாமை - உயிர் நிலையாமை அறம் செய்வான் திறம் - அறம் செய்யான் திறம் - அன்புடைமை - அன்பு செய்வாரை அறிவன் சிவன்.	15	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
III	காயசித்தி உபாயம் - அமுரி தாரணை - யோகம் - நிராகாரம்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	துறவு - தவம் - தவவேடம் - ஞான வேடம் - சிவ வேடம் - அருளொளி - சிவபூசை - மகேசுவர பூசை.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	முக்குற்றம் - முப்பதம் - அவா அறுத்தல் - பத்தியுடைமை - முத்தியுடைமை - ஒளி - தூல பஞ்சாக்கரம் - சொரூப உதயம்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,

				K6
VI	சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல முதல் தந்திரம் – கல்வி, நடுவுநிலைமை, கொல்லாமை	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பாட நூல்கள்

வ.எண்	ஆசிரியர்	வெளியிட்ட ஆண்டு	நூல்	பதிப்பு	பதிப்பக முகவரி
1	புலவர் அடியன் மணிவாசகன்	2017	திருமந்திரம்	ஐந்தாம் பதிப்பு	சாரதா பதிப்பகம், இராயப்பேட்டை, சென்னை, 600 014

இணையதளமுகவரிகள்

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கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் செ.புனிதா

பாடத்திட்டம் – SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>பாரதியின் பன்முகக் கவிதைகள் - தேசிய கீதங்கள் - பாரத மாதா திருப்பள்ளி எழுச்சி - தொண்டு செய்யும் அடிமை - சுதந்திர தாகம் - விடுதலை - மகாத்மா காந்தி பஞ்சகம் பக்தி பாடல்கள் - காணி நிலம் வேண்டும் - நல்லதோர் விடுதலை - அன்னையை வேண்டுதல் - காளிப் பாட்டு - முத்து மாரி - நந்தலாலா.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>பாரதியின் பன்முகக் கவிதைகள் ஞானப்பாடல்கள் - சென்றது இனி மீளாது - அறிவே தெய்வம் வசன கவிதை :காற்று</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>பாரதியின் கட்டுரைகள் பெண் - தமிழர்நாட்டு நாகரிகம் - தமிழின் நிலை - தேசியக் கல்வி -1, - தமிழருக்கு.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>கதைகள் ஸ்வர்ண குமாரி - மிளகாய்ப்பழச் சாமியார் - காக்காய் பார்லிமெண்ட் - குதிரைக் கொம்பு - புதிய கோணங்கி.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>காவியம் கண்ணன் பாட்டு - கண்ணன் என் தோழன் , கண்ணன் என் தாய், கண்ணன் என் தந்தை, கண்ணன் என் அரசன், கண்ணன் என் சேவகன்</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல பாரதியின் வாழ்க்கை வரலாறு	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6
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பாடநூல்கள்

- 1.பாரதியார், 1981, பாரதியார் கட்டுரைகள், வானதி பதிப்பகம், சென்னை.
2. பாரதியார்.2014, பாரதியார் கவிதைகள் ,மணிவாசகர் பதிப்பகம், சென்னை.
3. பாரதியார் 1977, பாரதியார் கவிதைகள் ,பூம்புகார் பதிப்பகம். சென்னை.

பார்வை நூல்கள்:

பாரதியார் படைப்புகள் முழுவதும்.

இணையதளமுகவரிகள்

<http://www.tamilsurangam.com>

<https://ta.m.wikibooks.org>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் மு.அனு

பாடத்திட்டம் – SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ஆய்வு, ஆராய்ச்சி, திறனாய்வு - சொற்பொருள் விளக்கம் - தமிழ் இலக்கியங்களில் இச்சொற்கள் பயின்றுவருமிடங்கள் - பழந்தமிழரின் ஆய்வுப்போக்கு - சங்கம், சங்கப் பலகை அரங்கேற்றம் - உரையாசிரியர்களின் ஆய்வுநிலை - தற்கால ஆய்வுப்போக்கு.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	ஆய்வுப் பொருள் தேர்வு - ஆய்வாளருக்குரிய தகுதிகள் - ஆய்வுக்குரிய தகுதிகள் - ஆய்வுக்குரிய களம் - ஆய்வு நோக்கினைச் சுட்டல் -ஆராயும் பொருள் பற்றித் தெளிதல் - சிக்கலைத் தெரிவு செய்தல் - ஆய்வுப் பொருள் பற்றி இதுவரை செய்யப்பட்ட ஆய்வு முயற்சிகளின் ஏற்பு - ஐயம் - மாற்றம் - ஆய்வுகளின் தற்போதைய நிலை.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	ஆய்வுப் பொருள் தொகுப்பு - அடிப்படைக்கூறுகள் - துணை நிலைக் கூறுகள் - இவற்றைத் தொகுத்தலும் பகுத்தலும் - பல்வேறு வகை தொகை முறைகள் நேர்காணல் - வினாத் தொகுதி - மாதிரிக்கூறு - உற்றாய்வு - களப்பணி.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	ஆய்வு நெறி முறைகள் - அளவையியல் முறை - அமைப்பு முறை - வரலாற்று முறை - பகுப்பாய்வு முறை - புள்ளி விவர ஆய்வு முறை - கள ஆய்வு முறை.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	ஆய்வேட்டை உருவாக்கும் பல்வகை நிலைகள் - மாதிரி வரைவு - நெறியாளர், துறை வல்லுநர் கருத்தறிதல் - கலந்துரையாடல் - மாதிரி வரைவை மறு பார்வை செய்தல் - திருத்தல் - செம்மையாக்குதல் - ஆய்வேட்டின் அமைப்பு பகுதிகள் - இயல் பகுப்பு - சுருக்கக் குறியீடு - அடிக்குறிப்புகள் அட்டவணை - விளக்கப்படங்கள் - பின்னிணைப்பு முதலியன ஆய்வேட்டின் கட்டமைப்பும் புறத்தோற்றமும்.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல நூலகப்பயன்பாடு - பிழைகளை அகற்றல் - மேற்கோள்	-	CO1, CO2, CO3, CO4, CO5	K3, K4, K5, K6

பார்வை நூல்கள் :

வ. எண்	ஆசிரியர்	நூல்	பதிப்பகம்	ஆண்டு
1	டாக்டர் தமிழண்ணல்	ஆய்வியல் அறிமுகம்	மதுரை மீனாட்சி புத்தக நிலையம் மதுரை	1977
2	பாலசுப்பிரமணியன் கு.வே	ஆய்வியல் நெறிகள்	உமா நூல் வெளியீட்டகம் தஞ்சாவூர்	2014
3	டாக்டர் விஸ்வநாதன்	ஆய்வு நெறிமுறைகள்	தமிழ்ப்புத்தகாலயம் சென்னை	1966
4	டாக்டர் பொற்கோ	ஆராய்ச்சி நெறிமுறைகள்	ஐந்திணைப் பதிப்பகம்	2005

			சென்னை	
5	டாக்டர் வே. சிதம்பரநாதன்	ஆய்வியல் முறைகள்	சுபா பதிப்பகம் நாகர்கோயில்	1988

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

Web Resources

www.tamilvu.org

www.noolaham.in

www.projectmadurai.org

www.chennailibrary.com

<http://kalithogai.blogspot.in>

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர்.இர.கீர்த்தனா

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22PTA2DSE2B	கல்வெட்டியல்	DSE	6	3

நோக்கம்

1. கல்வெட்டுகளின் வழி வரலாற்றை கற்பித்தல்.
2. பழந்தமிழரின் மொழிப்புலத்தை பயிற்றுவித்தல்.
3. கல்வெட்டுகளின் மூலம் காலத்தை கண்டறியச்செய்தல்

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive gLevel
CO1	கல்வெட்டுகளை மதிப்பிட்டு அவற்றை வகைப்படுத்தி அறிதல்	K4, K6
CO2	கல்வெட்டுகளில் உள்ள கோட்பாடுகளைப் பகுத்தாய்தல்	K5
CO3	கல்வெட்டுகளில் உள்ள வாழ்வியல் விழுமியங்களை பகுத்துணர்ந்து மனிதகுல மேம்பாட்டிற்குப் பயன்படுத்துதல்	K5, K6
CO4	கல்வெட்டுகளை ஆராய்ந்து விமர்சிக்கும் திறன் பெறுதல்	K3 K4
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் கல்வெட்டுகளை ஆய்ந்தறிதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3

CO5	2	2	3	2	3	2	2	2	2	3
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பாடத்திட்டம் - SYLLABUS				
UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	கல்வெட்டியல் - ஓர் அறிமுகம் - எழுத்துக்களின் தோற்றம் - எழுத்துக்களின் வகைகள் - எழுதுபொருட்கள் - குறியீடுகளும் எழுத்துக்களும்.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	தமிழி அறிமுகம் - தமிழி எழுத்துப்பயிற்சி - தமிழி கல்வெட்டுக்கள் - வட்டெழுத்துக்கள் - அறிமுகம் - வளர்ச்சி - பயிற்சி.	15	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
III	கல்வெட்டுகளில் காலக்கணிப்பு முறைகள் - கலி - சக - கொல்லம் - ஆண்டுகள் - வியாழவட்டம் - பஞ்சாங்கக் குறிப்புகள் - ஆட்சியாண்டு - எழுத்தமைதி அடிப்படையில் காலம்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	கல்வெட்டுகளும் இலக்கியமும் - செப்பேடு பதிப்பித்தலில் அணுகுமுறை - மெய்க்கீர்த்தி - ஓலையும் கல்வெட்டும்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	அமன்பாக்கம் சாசனம் - பாக்கூர் சாசனம் - கல்வெட்டுகள் படியெடுத்தல் - படித்தல் - பயிற்சி	20	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,

			CO5	K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல கல்வெட்டுகளை ஆராய்ந்து படியெடுத்தல் பயிற்சி	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

பாட நூல்

வ.எண்	ஆசிரியர்	வெளியிட்ட ஆண்டு	நூல்	பதிப்பு	பதிப்பக முகவரி
1	ராஜன்.கா		கல்வெட்டியல்		மனோ பதிப்பகம் சென்னை

பார்வை நூல்கள்

வ.எண்	ஆசிரியர்	வெளியிட்ட ஆண்டு	நூல்	பதிப்பு	பதிப்பக முகவரி
1	முனைவர் எ.சுப்பராயலு முனைவர் செ.இராசு (ப.ஆ)		தமிழ்க் கல்வெட்டிய லும் வரலாறும்		தமிழ்ப் பல்கலைக்கழகம் வெளியீடு, தஞ்சாவூர்
2	வித்துவான் திரு.வை.சுந்தரேசுவாண் டையார் உரை		கல்வெட்டு		பொதிகைப்பதிப் பகம் 2, சீதாராமநகர், கடலூர்

இணையதளமுகவரிகள்

1. https://ta.m.wikipedia.org/wiki/%E0%AE%A4%E0%AE%AE%E0%AE%BF%E0%AE%B4%E0%AF%8D%E0%AE%95%E0%AF%8D_%E0%AE%95%E0%AE%B2%E0%AF%8D%E0%AE%B5%E0%AF%86%E0%AE%9F%E0%AF%8D%E0%AE%9F%E0%AF%81%E0%AE%95%E0%AE%B3%E0%AF%8D

2. <https://m.facebook.com/tamiltamilartonmam/posts/2995372860540096>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடப்பகுதி வடிவமைப்பாளர் : முனைவர் வி.கவிதா

Semester II	Internal Marks : 25	External Mark 75		
பாடக்குறியீடு	பாடம்	Category	Hrs/Week	Credits
22PTA2DSE2C	வைணவமும் தமிழும்	DSE	6	3

நோக்கம்

- தொல்காப்பியர் காலம் முதல் காணப்படும் வைணவச் சிந்தனை இலக்கிய வகைமையை பகுத்தறிவர்.
- பிரபந்த நெறிகளுக்கு வைணவத்தின் அருங்கொடை ஆகியவற்றைக் கண்டறிவர்.
- வைணவ இலக்கியங்களின் வழி வாழ்வியல் நெறிகளை அறிவர்.

COURSE OUTCOME

இப்பாடத்தினைப் பயில்வதால் மாணவியர் பெறும் திறன்கள்

CO No.	CO Statement	Cognitive gLevel
CO1	வைணவ இலக்கியங்களை மதிப்பிட்டு அன்றைய சமூக சிந்தனைகளை மற்றும் மொழித்திறனை வகைப்படுத்தி அறிதல்	K4, K6
CO2	வைணவ இலக்கியங்களில் உள்ள கொள்கை, கோட்பாடுகளைப் பகுத்தாய்தல்	K5
CO3	வைணவ இலக்கியங்களில் உள்ள வாழ்வியல் விழுமியங்களை பகுத்துணர்ந்து மனிதகுல மேம்பாட்டிற்குப் பயன்படுத்துதல்	K5, K6
CO4	வைணவ இலக்கியங்களின் தனித்தன்மையை ஆராய்ந்து விமர்சிக்கும் திறன் பெறுதல்	K3 K4
CO5	போட்டித் தேர்வுகளுக்கேற்ற வகையில் வைணவ இலக்கியங்கள், உரைகள் ஆகியவற்றை ஆய்ந்தறிதல்	K3 K4

Mapping with CO, PO & PSO :

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	2	3	1	3	3	3
CO2	2	3	2	1	3	3	3	3	3	3
CO3	2	2	1	2	1	3	3	3	3	1
CO4	1	3	3	2	3	2	1	2	3	3
CO5	2	2	3	2	3	2	2	2	2	3

பாடத்திட்டம் - SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	வைணவம் – விளக்கம் – இந்திய நாட்டில் வைணவம் வளர்ந்த வரலாறு, பரிபாடல், சிலம்பு, வைணவக் குறிப்புகள்.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	பன்னிரு ஆழ்வார்கள் – வரலாறு, நாலாயிர திவ்யப் பிரபந்தம் - இராமானுசர் வரலாறும் படைப்புகளும்.	15	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
III	கம்பராமாயணம் – வில்லிபாரதம் – பாகவதம்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	வைணவச் சிற்றிலக்கியங்கள் – பிள்ளைப் பெருமாள்யங்கார், வேதாந்த தேசிகர் பாடல்கள்.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	பகவத்கீதை வைணவ ஆகமங்கள்	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	(சுய கற்றல்) இப்பகுதி பருவத்தேர்விற்கு உரியதல்ல திருப்பாவை	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

பார்வை நூல்

சுப்புரெட்டியார்.ந.(1995).வைணவ சமயம். தமிழ்ப்பல்கலைக்கழகம், தஞ்சாவூர்,

இணையதளமுகவரிகள்

1.https://m-tamil.webdunia.com/religion/religion/article/0705/21/1070521017_1.htm?amp=1

2.<http://keetru.com/index.php/2009-10-07-10-44-25/2011-sp-41283151/17598-2011-11-30-03-20-32>

3.<https://hindumatham.in/h4>

கற்பித்தல் முறைகள்

கலந்தாய்வு, வினாடி வினா, திட்டக்கட்டுரை, கரும்பலகை, குழுவிவாதம்

பாடப்பகுதி வடிவமைப்பாளர்

முனைவர் ந.சுபா

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III Cycle) with “A” Grade by NAAC

ISO 9001: 2015 Certified

Annamalai Nagar, Trichy-18.



DEPARTMENT OF OTHER LANGUAGES- HINDI

2022-2023 and Onwards



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DEPARTMENT OF OTHER LANGUAGES- HINDI

AGENDA

The Agenda for the Seventh Meeting of the Board of Studies are as follows:

1. ITEM NO.BOS/07/01

To consider and approve the curriculum and Syllabus for II, III and IV semesters of Part-1 HINDI for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. ITEM NO BOS/07/02

To suggest action plans for the enhancement of the students.

3. ITEM NO BOS/07/03

Any other item with the permission of the Chair.

At the outset, the Chairman welcomed the members for attending the meeting of the Board of Studies (UG). Discussions based on the agenda were carried out.



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MINUTES OF THE SEVENTH MEETING OF BOARD OF STUDIES

DATE: 19th OCTOBER 2022

TIME: 11 am

VENUE: ‘E’ Block , Cauvery College for Women (Autonomous) Google

Meet link :

MEMBERS PRESENT FOR THE SEVENTH BOARD OF STUDIES MEET

S	Name	Designation
1	Dr. R.Vijayalakshmi	Chairperson, Assistant Professor
2	Dr.S. Kareemullah	University Nominee Associate professor&Head, Jamal Mohammed College, Trichy-20.
3	Dr. P. Saraswathi	1.Subject Expert, Assitant professor, University of Madras, Madras-5
4	Dr. A. Saframma	2.Subject Expert Assitant professor & Head, The American College (Autonomous) Madurai
5	Mrs. N.AravindaNayaki	Industrial Expert The Secretary(Incharge), Dhakshin Bharath Hindi Prachar Sabha (Tamil Nadu),Trichy -17
6	Mrs. Reddy Madhuvanti Bhasker	Student Nominee No.2, 3 rd Cross, Moogambigai Nagar, Reddiyarpalayam, Pudhucherry-10
7	Ms. K. Keerthana	Student III Year B.Com Reg. No. 201111108



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS

Nationally Accredited (III Cycle) with „A“ Grade by

NAAC ISO9001:2015 Certified, Annamalai agar, Trichy 18

Minutes of the Seventh Board of Studies Meeting held on
19/10/2022

The following Resolutions were passed by the Board of Studies Members

ITEM NO: 1

To consider and approve the Curriculum and Syllabus for UG Part-I- HINDI.

The Committee discussed and approved the Syllabus for **PART-1 HINDI**

“Resolved that to consider and approve the Curriculum and Syllabus for Part-1 HINDI”

Considered and approved the PSO, the Programme structure and Semester syllabus of II, III and IV of Hindi Literature & Grammar –II, Hindi Literature & Grammar –III & Hindi Literature IV & Functional Hindi for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 with the following changes:

Hindi Literature & Grammar –II

UNIT-1 -Replaced the Prose- Gillu, Nayee Sanskruti Ki Oar, Adhunik Yug mein Yog, Himmath aur Zindagi. - **Gadhya Pradeepa**

UNIT-2 -Replaced the Daud Novel for Ladayee Drama

UNIT-3. – To Merge the Bakthi Sahithya Kaal & Nirgun Bakthi

Unit 4. Sagun Bakthi

UNIT 5- Kaal, Kriya Visheshan, Preposition

UNIT-6 -Applied Grammar(Students Self Study)

Hindi Literature & Grammar –III

Unit- 1- Replaced the Poems – Sakhi, Ram-Van-Gaman, Bal Leela, Dohe -**Kavya Lahar.**

UNIT-2 - Replaced the Poems –Parivarthan, Bagavan ke Dakiye, Anubhav Paripakva, Kuch Tho- **Kavya Lahar.**

UNIT-3-Dhruvaswamini (Natak)

UNIT-4 Reethikaal& Biharin- Hindi Sahithya ka Saral Ithihas.

UNIT-5- Conjunction, Interjunction, Idioms & Phrases (Each 10)

UNIT-6 – One Act Play- Reed ki Haddi, Jalkari Bai, Anderi Nagari. (Students Self Study)

Hindi Literature IV & Functional Hindi

UNIT-1-Translated Story- Thotha aur Myna, Mrithy Dhand, Hrudhaya ki Pukar, Bibi ka Katha Lekhan- **Dakshini Kathayen**

UNIT-2- Aadhunik Kaal Parichaya & Pramuk Vidhayen Sanshiph Parichaya.

UNIT-3- Technical Terms and Precise Writing

UNIT-5- Replaced the Translation for General Essays

UNIT-6. General Essays(Students Self Study)

ITEM No.2:

To suggest action plans for the enhancement of the students

- ❖ Include more oral and written activities to develop the Communication and Translation Skill. Of the students.
- ❖ More MCQ's in the question paper.

Finally it was resolved as under

" Resolved that to consider and approve the Internal and External Evaluation System to be noted."

The meeting ended with a vote of thanks to the chair.

1. (University Nominee)

Dr. S. Kareemullah ,
Associate Professor & Head,
Jamal Mohammed College(Autonomous),
Trichy -620 020.

2. (Subject Expert-1)

Dr. P. Saraswathi
Associate Professor & Head,
Madras University,
Madras-600 005

3. (Subject Expert-2)

Dr.Saframma,
Assistant Professor & Head,
The American College,
Madurai-2

4. Industrial Expert

Mrs N.Aravindanayaki
Secretary(I/C)
Dhakshina Bharat Hindi Prachar ssabha, (Tamil Nadu).
Trichy

5. (Student Nominee)

Reddy Madhuwanti Bhasker,
No.2, 3rd Cross Moogambigai Nagar,
Reddiyarpalayam,Pondicherry-10.

K. Vijayalakshmi
Chairman
Board of Studies
19/10/22

[Signature]
19/10/22

P. Saraswathi

A. Selva
19/10/22

N. Aravindanayaki
19.10.2022

[Signature]

DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMIL NADU

[Signature]
சென்னை பல்கலைக்கழகம்
மொழி அறிவுறுத்தல்
பகுதி - 620 018

CAUVERY COLLEGE FOR WOMEN(Autonomous)

ANNAMALAI NAGAR, TRICHY-6210 018

B.A./B.Sc./B.Com./B.B.A./B.C.A.(3YEARS)

PART-I HINDI

(Applicable to the candidates to be admitted from the academic year 2022-2023 onwards)

Seme Ster	Part	Subject Code	Course Title	Ins t. Ho urs	Cre dit	Exam Hours	Inter Nal	Exter nal	Total
I	I	22ULH1	HINDI LITERATURE &GRAMMAR-1	6	3	3	25	75	100
II		22ULH2	HINDI LITERATURE & GRAMMAR-II	5	3	3	25	75	100
III		22ULH3	HINDI LITERATURE & GRAMMAR-III	5	3	3	25	75	100
IV		22ULH4	HINDI LITERATURE & FUNCTIONAL HINDI	6	3	3	25	75	100

(Handwritten signature)

பிரபலமணி சி.இராமலக்ஷ்மி
புவனம் நிதிநலத்துறை
புதிதாகப்பட்டி (தஞ்சை) சி
தஞ்சை - 620 018

(Handwritten signature)

DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

VISION:

To develop a positive outlook towards Hindi Language among the students and create the Language Proficiency and Communication Skill of the students in Hindi Language.

MISSION :

To Provide the basic and general information about Hindi Language and inculcate interest among students in the study of Hindi Literature, along with academic excellence.

Program Outcomes (POs)

PO 1: Disciplinary knowledge

Students will identify the nuances and ability of language in formal and informal context, describe the grammatical and lexical subtleties in language and literature and apply them in the fields of performing arts, visual arts, literature, hospitality and translation.

PO 2: Communication Skills & Cooperation/Teamwork

Students will distinguish different communication strategies to express themselves both orally and verbally and demonstrate their ability with the LSRW skills to communicate with confidence, coherence, clarity, open-mindedness, and exhibit their team spirit.

PO 3: Critical thinking, Problem solving, Reflective thinking & Leadership qualities

Students will display necessary knowledge in fields of performing arts, visual arts, literature, hospitality and translation and develop projects and start-ups with decisiveness, integrity and problem-solving skills.

PO 4: Professionalism, Moral and ethical awareness

Students will internalize human values embedded in cultural, social, historical and literary texts to deal with various problems in life with confidence, reasoning and responsibility displaying moral and social values with sensitivity to gender, age, caste, race, religion and nationality.

PO 5: Impact of education on society and the environment & Ethics and equity

Students will recognize the values of a clean environment and sustainability of natural resources for society and practice equity and equality in society and thereby develop social responsibility.

Program Specific Outcomes (PSOs)

PSO 1: Analyse the basic concept and subject of Hindi & its origin to develop an understanding of the features of Hindi literary forms in context of socio - cultural and political conditions of that period.

PSO 2: Create awareness and motivate the students to write and speak standard Hindi.

PSO 3: Integrate knowledge base regarding the importance of the names given to each Literary form of Hindi literature.

PSO 4: Develop the methods of communication, to improve their LSRW skills, to enable them to practice those skills in their daily life by identifying instances of communication in the circumstances of their own.

PSO 5: Exploring, analyzing and enriching self-knowledge to nurture analytical qualities or skills, thinking power, creativity through assignments & Discussions.

HINDI LITERATURE & GRAMMER - I

Semester I	Internal Marks 25		External Marks 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22ULHI	Hindi Literature & Grammar-I	Language	6	3

Course Objectives :

To make the students to understand the Translation practice various forms of the Stories and different aspects of the social issues through Hindi Stories.

Course Outcomes and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills.

Cos	CO STATEMENT	COGNITIVE LEVEL
CO-1	Understand the story forms	K1
CO-2	Explain the works of Hindi writers.	K2
CO-3	Complete the sentences in Hindi using basic Grammar.	K3
CO-4	Analyze the Social & Political conditions of Ancient Period in Hindi Literature.	K4
CO-5	Justify the human values stressed on the works of the following authors 'Premchand, Suryabala, Sudha Aroda etc.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	3

SYLLABUS

Unit	Content	Hours	Cos	Cognitive levels
I- Katha Parikrama-I	Hindi Story Literature -An Introduction Takur ka Kuvan-Premchand Paramthma ka Kuththa -Mohan Rakesh	16	CO1, CO2, CO3	K1,K2,K3,K4
II- Katha Parikrama-II	Padav – Suryabala Rahogi Thum Vahi - Sudha Aroda Sandhi Pathra - Deepthi Khandelval	16	CO1, CO2, CO3	K1,K2,K3,K4
III- Hindi Sahithya ka Itihaz	1. Kal Vibhajan 2. Adhikal (Veeragathakal ki Paristhithiyan Aur Visheshatheyen) 3. Pramuk Rachanayen Aur Kaviyon - a. Ameer Kusro b. Vidhyapathi c. Prithviraj Rason	20	CO1, CO2, CO3	K1,K2,K3,K4
IV- Grammar - Vikari Shabdh	1. Noun 2. Pronoun 3. Adjective 4. Verb 5. Gender 6. Numbers 7. Case Endings 8. Adjective	18	CO1, CO2, CO3	K1,K2,K3,K4
V- Anuvadh Abyas	(Lesson1-10 English to Hindi)	20	CO1, CO2, CO3	K1,K2,K3,K4
VI- Students Self Studies	1. Thapasya - Himanshu Joshi 2. Kotari mein Ladki - Mrinal Pandey 3. Jain, Naath, Bowdha Sahithya- Parichaya, Beesaldev 4. Anuvadh Abyas-Lesson 1-10 Hindi to English			

Text Books

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Katha-Parikrama	Dr.Namadev M.Gowda	Jawahar Pusthkalay Mathura, U.P. 281 001	2017
02	Hindi Sahithya ka Sanshipta Ithihas	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2015
03	Rashtrbasha Patya Pusthak	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2022
04	Hindi Vyakaran Praveshika – 1	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2021

Reference Books:

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Prayogic Hindia Vyakaran Rachana, Kunji Sahith	Kumari N. Saradambal	Compurint, Chennai	2014
02	Saral Hindi Vyakaran	Dr.Smitha	Arpit Prakashan, Illahabad	2014

WEB References:

1. <https://www.study.com/hindi>
2. <http://rajeduboard.rajasthan.gov.in>
3. <https://exambaaz.com/hindia-grammar/pdf/amp/>

Pedagogy: Lecture, Black/White Board, PPT, YouTube Presentation, Quiz, Discussion, Assignment.

Course Designer: Dr.R. VIJAYALAKSHMI

Semester II	Internal Marks 25		External Marks 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22ULH II	Hindi Literature & Grammar-II	Language	5	3

Course Objectives

1. To understand the literary forms of Hindi literature especially Prose, Novel, Reminiscence, Essay.
2. To understand the human values of the youth..
3. To display moral and social values in the field of hospitality and integrity.
4. To inculcate knowledge of Environment and Social Responsibility.
5. The usage of words and phrases, how they help us to better understand ourselves and the people in the society.

Course Outcomes and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills.

Cos	CO STATEMENT	COGNITIVE LEVEL
CO-1	Understand the Prose, Novel forms	K1
CO-2	Explain the works of Hindi writers.	K2
CO-3	Complete the sentences in Hindi using basic Grammar.	K3
CO-4	Analyze the Social & Political conditions of Medieval Period in Hindi Literature.	K4
CO-5	Justify the human values stressed on the works of the following authors 'Mahadevi Verma, Ramvruksha Benipuri, Dhinakar, Ajay etc.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	3

SYLLABUS

Unit	Content	Hours	Cos	Cognitive levels
I- Prose	1. Gillu – Mahadevi Verma 2. Nayee Sanskruthi ki Oar – Ramvryksha Benipuri 3. Adhunik Yug mein Yog – Dr.Ajay Prathap Singh 4. Himmath Aur Zindhagi – Ramadharisingh Dhinakar	14	CO1, CO2, CO3	K1,K2,K3,K4
II- Laghu Upanyas	Daud – Mamatha Kaliya	20	CO1, CO2, CO3	K1,K2,K3,K4
III- Hindi Sahithya ka Itihās	1. Bakthi Kall ki Paristhithiyan aur Visheshathayen, Baksthi Dharayen 2. Nirgun Bakthi – Gnan Marg, Prem Marg 3. Parmuk Kavi– Kabir	15	CO1, CO2, CO3	K1,K2,K3,K4
IV- Hindi Sahithya ka Itihās	1. Sagun Bakthi–Ram Bakthi – Tulasidas 2. Krishna Bakthi – Surdas 3. Pramuk Kavi – Ashtachap	14	CO1, CO2, CO3	K1,K2,K3,K4
V-Grammar	1. Adverb 2. Tense 3. Preposition	12	CO1, CO2, CO3	K1,K2,K3,K4
VI- Students Self Study	Applied Grammar			

Text Books

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Gadhy Pradeep	Govindh Pachori	Jawahar Pusthakalay Mathura,	2021
02	Daud	Mamtha Kaliya	Vani Prakashan, New Delhi	2014
03	Hindi Sahithya ka Sanshipta Itihās	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2015

04 Hindi Vyakaran Praveshika – I --- Dakshin Bharat Hindi Prachar Sabha, Madras 2021

Reference Books:

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Prayogic Hindia Vyakaran thatha Rachana, Kunji Sahith	Kumari N. Saradambal	Compurint, Chennai	2014
02	Saral Hindi Vyakaran	Dr.Smitha	Arpit Prakashan, Illahabad	2014

WEB References:

1. <https://www.study.com/hindi>
2. <https://exambaaz.com/hindia-grammar/pdf/amp/>
3. <http://rajeduboard.rajasthan.gov.in>
4. <http://www.academia.edu>

Pedagogy: Lecture, Black/White Board, PPT, YouTube Presentation, Quiz, Discussion, Assignment.

Course Designer: Dr.R. VIJAYALAKSHMI

HINDI LITERATURE & GRAMMER – III

Semester III	Internal Marks 25		External Marks 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22ULH III	Hindi Literature & Grammar-III	Language	5	3

Course Outcomes and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills.

CO	Description	Cognitive level
CO1	Understand the Medieval periods of Hindi Literature.	K1, K2
CO2	Develop critical and logical thinking to understand Indian Culture.	K3
CO3	Focus on evaluating the social changes through Drama.	K4
CO4	Complete the sentences in Hindi using basic Grammar.	K3
CO5	Prepare them to understand, evaluate and interpret the poems in their own style.	K4

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	2

SYLLABUS

Unit	Content	Hours	Cos	Cognitive levels
I- Medieval Poems	1. Mahathma Kaberdas-Saakhi 2. Goswamy Thulasidas-Ram-Van-Gaman 3. Mahathma Surdas -Baal Leela 4. Kavivar Rahim – Dohe	16	CO1, CO2, CO3	K1,K2,K3,K4
II- Modern Poems	Sumithranandan Panth - Parivarthan Ramdhari Singh Dhinakar-Bagavan ke Dakiye Agneya - Anubhav Paripakva Ashok Vajpeyee -Kuch Tho	16	CO1, CO2, CO3	K1,K2,K3,K4
III-	Dhruvaswamini- Jayashankar Prasadh	17	CO1, CO2, CO3	K1,K2,K3,K4
IV- Hindi Sahitya ka Itihas	1. Reethi Kal Parichaya-Prakaron Paristhithiyan Aur Visheshatheyen 3. Pramuk Kavi- Biharilal	14	CO1, CO2, CO3	K1,K2,K3,K4
V- Grammar -	Conjunction, Interjunction, Idioms & Phrases (Each 10)	12	CO1, CO2, CO3	K1,K2,K3,K4
VI- Students Self Studies	One Act Play- Reed ki Haddi, Jalkari Bai, Anderi Nagari			

Text Books

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Kavya-Lahar	Dr.V.Bhaskar	Jawahar Pusthakalay Mathura, U.P. 281 001	2016
02	Dhruvaswamini	Jayashankar Prasad	Kamal Prakashan, New Delhi – 110 002.	
03	Hindi Sahithya ka Sanshipta Ithihas	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2015
04	Rashtrbasha Patya Pusthak	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2022
05	Hindi Vyakaran Praveshika – 1	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2021

Reference Books:

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Prayogic Hindia Vyakaran Itihasa Rachana, Kunji Sahith	Kumari N. Saradambal	Compurint, Chennai	2014
02	Saral Hindi Vyakaran	Dr.Smitha	Arpit Prakashan, Illahabad	2014

WEB References:

1. <https://www.study.com/hindi>
2. <http://rajeduboard.rajasthan.gov.in>
3. <https://exambooz.com/hindia-grammar/pdf/amp/>

Pedagogy: Lecture, Black/White Board, PPT, YouTube Presentation, Quiz, Discussion, Assignment.

Course Designer: Dr.R. VIJAYALAKSHMI

HINDI LITERATURE – IV & FUNCTIONAL HINDI

Semester IV	Internal Marks 25		External Marks 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22ULH IV	Hindi Literature IV & Functional Hindi	Language	6	3

Course Objectives

1. Understand the basic and fundamental principles of translation.
2. Teach various literary forms of official and unofficial letter writing..
3. Inculcate the knowledge of Precise writing..
4. Apply the knowledge of modern ethics with Indian Modern Translated stories.
5. The.

Course Outcomes and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills.

Cos	CO STATEMENT	COGNITIVE LEVEL
CO-1	Understand the Technical Terms.	K1
CO-2	Explain & Preparing the Letter writing.	K4
CO-3	Understanding & Preparing the Precise Writing	K3
CO-4	Analyze the Social & Political conditions of Modern Period in Hindi Literature.	K4
CO-5	Justify the human values stressed on the works of the following authors 'Kalki, Sharma, Rao, Krishnanpillai ,etc.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	3

SYLLABUS

Unit	Content	Hours	Cos	Cognitive levels
I- Dakshini Kathayen	1. Thotha aur Myna- Jamadhgani Sharma 2. Mrithy Dhand -R. Krishnamurthy Kalki 3. Hrudhaya ki Pukar- A.N. Krishna Rao 4. Bibi ka Katha Lekhan-E.V. Krishnapillai	16	CO1, CO2, CO3	K1,K2,K3,K4
II- Hindi Sahithya ka Itihas	Aadhunik Kaal Parichaya & Pramuk Vidhayen Sanshipth Parichaya	16	CO1, CO2, CO3	K1,K2,K3,K4
III- Technical Terms & Precise Writing	Technical Terms and Precise Writing 1. Name of the Ministries 2. Name of Offices 3. Designations & Occupation 4. Evaluation Words 5. Precise Writing – 5 Exercises	20	CO1, CO2, CO3	K1,K2,K3,K4
IV- Letter Writing	Letter Writing: 1. Definition, Types, Writing Methods 2. Personal Letter – Relations/Friends 3. Social Letter – Invitation/Expressions 4. Commercial Letter – Book Order/Complaint/Request Letter/Job Application 5. Official Letter – Circular/Reminder	18	CO1, CO2, CO3	K1,K2,K3,K4
V- Sansadh Abyas	(Lesson 1-10 English to Hindi)	20	CO1, CO2, CO3	K1,K2,K3,K4
VI- Students Self Studies	General Essays			

Text Books

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Dakshini Kathayen	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2015
02	Hindi Sahithya ka Sanshipta Ithihas	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2015
05	Anuvadh Evam Vyavaharik Pathra Vyavahar	Prof.Vanaja.K.G	Govind Prakashan, Mathura (U.P) 281 001.	2021
04	RajBhasha Bodhini	---	Dakshin Bharat Hindi Prachar Sabha, Madras	2011

Reference Books:

S.No.	Book Name	Author/Editor	Publishers	Year of Publishing
01	Prayogic Hindia Vyakaran Mutha Rachana, Kunji Sahith	Kumari N. Saradambal	Compurint, Chennai	2014

WEB References:

1. <https://www.study.com/hindi>
2. <http://rajeduboard.rajasthan.gov.in>
3. <https://exambaaz.com/hindia-grammar/pdf/amp/>

Pedagogy: Lecture, Black/White Board, PPT, YouTube Presentation, Quiz, Discussion, Assignment.

Course Designer: Dr.R. VIJAYALAKSHMI

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

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DEPARTMENT OF OTHER LANGUAGES- FRENCH

SEVENTH BOARD OF STUDIES MEET

2022-2023 and Onwards



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Annamalai Nagar, Trichy-18.

DEPARTMENT OF OTHER LANGUAGES- FRENCH

AGENDA

The Agenda for the Seventh Meeting of the Board of Studies are as follows:

1. ITEM NO.BOS/07/01

To consider and approve the curriculum and Syllabus for II, III and IV semesters of Part-I French for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. ITEM NO BOS/07/02

To suggest action plans for the enhancement of the students.

3. ITEM NO BOS/07/03

Any other item with the permission of the Chair.

At the outset, the Chairman welcomed the members for attending the meeting of the Board of Studies (UG). Discussions based on the agenda were carried out.



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MINUTES OF THE SEVENTH MEETING OF BOARD OF STUDIES

DATE: 20th OCTOBER 2022

VENUE: Google Meet, NET Lab, Cauvery College for Women
(Autonomous)

TIME: 10.30 am

MEMBERS PRESENT FOR THE SEVENTH BOARD OF STUDIES MEET

	Name	Designation
1	Mrs.M.Manjul a	Chairperson, Assistant Professor
2	Dr. Priya	Associate professor & Head, University Nominee Bharathidasan University, Trichy
3	Mr. G. Victor Packiyaraj	Assitant professor, Subject Expert, The American College (Autonomous) Madurai
4	Mrs. A. Angel Sahaya Ajitha	Assitant professor, Subject Expert, The American College (Autonomous) Madurai
5	Mr. Hermon Carduz	Industrial Expert
6	K. Yazhini	Student Alumnus



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS
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NAACIS 9001:2015 Certified, Annamalai Nagar, Trichy – 18

**Minutes of the Seventh Board of Studies Meeting held on
20/10/2022**

The following Resolutions were passed by the Board of Studies Members

ITEM NO: 1

To consider and approve the Curriculum and Syllabus for FRENCH.

The Committee discussed and approved the Syllabus for PART-1 FRENCH
“Resolved that to consider and approve the Curriculum and Syllabus for PART-1 FRENCH”

Considered and approved the PSO, the Programme structure and Semester syllabus of II, III and IV of Basic French –II, Intermediate French-I & Intermediate French- II for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 with the following changes:

Basic French-II

Unit 4- Remplacez le Passé composé avec les verbes pronominaux à place de pronoms compléments directs et les pronoms compléments indirects.

Unit 5- le futur simple avec les verbes réguliers.

Intermediate French –II

Unité 5- Remplacez les pronoms démonstratifs avec les pronoms relatifs composés.

ITEM NO: 2

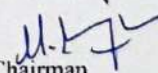
To suggest action plans for the enhancement of the students.

- To include more oral, written and listening activities to develop the communication of the students.
- To encourage and guide the interested students to take up French as a career.

Finally it was resolved as under

“Resolved that to consider and approve the Internal and External Evaluation System to be noted”

The meeting ended with a vote of thanks to the chair.


Chairman
(Board of Studies)

Members of the Seventh Board of Studies Meet

1. Dr. Priya	
Associate professor & Head	
Department of French	
University Nominee	
Bharathidasan University, Trichy	
2. Mr. Mr. G. Victor Packiyaraj	
Assitant professor	
Subject Expert	
Department of French,	
The American College (Autonomous)	
Madurai	
3. Mrs. A. Angel Sahaya Ajitha	
Assistant professor	
Subject Expert	
Department of French,	
The American College (Autonomous)	
Madurai	
4. Mr. Hermon Carduz	
Industrial Expert	
5. K. Yazhini	
Student Alumnus	



French Syllabus
2022-2023 onwards
Cauvery College for Women
(Autonomous)
UG- French

S.No	Part	Course Title	Teaching Hours	Credits	Exam Hours	Marks		Total Marks
						CIA	ESE	
1.	1	Basic French-I	6	3	3	25	75	100
2.	1	Basic French-II	5	3	3	25	75	100
3.	1	Intermediate French-I	5	3	3	25	75	100
4.	1	Intermediate French-II	6	3	3	25	75	100

Vision

To make language learning a worthwhile endeavor as in the age of increasing globalization, today's world is shrinking and getting smaller.

To develop a positive outlook towards the French Language among the students and create Language Proficiency and Communication Skill among the students.

Mission

To help the students realize their full potential and help them get started on their way to having a successful career and to inspire them to lifelong language learning, and do it ethically and exceedingly well.

**Program Specific Outcomes (PSO) For
French**

PSO NO	Programme Specific Outcomes
PSO 1	Express themselves clearly enough in both oral and written French to be generally understood by the average native speaker of the language
PSO 2	Use varied and appropriate vocabulary, as well as circumlocution when required, to discuss a variety of topics.
PSO 3	Demonstrate a good knowledge of the fundamental grammatical structures of French; discuss a variety of topics.
PSO 4	Identify basic grammatical errors, as well as many of those common to Anglophone speakers of French.
PSO 5	Demonstrate a basic knowledge of the history and culture of France.

Part –I Basic French-I

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGOR Y	Hrs / Week	CREDIT S
22ULFI	BASIC FRENCH-I	Language	6	3

COURSE OBJECTIVES

- To acquire basic grammar and vocabulary in French.
- To have a knowledge of French and Francophone culture.
- To be able to communicate in simple real life situations.

Course outcome and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills

CO1	Use varied and appropriate vocabulary as well as circumlocution when required to discuss a variety of topics.	K1
CO2	Demonstrate a good knowledge of the fundamental grammatical structures of French.	K2
CO3	Demonstrate a good knowledge of the history, culture and gastronomy of France.	K3
CO4	Express themselves clearly enough in both oral & written French.	K4
CO5	Listen to basic spoken French and demonstrate understanding by writing and/or responding appropriately	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	4	4	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	4

SYLLABUS

Unit	Content	hours	COs	Cognitive level
1	<p>Vous comprenez</p> <p>Vous connaissez la chanson Se présenter - Aborder quelqu'un Saluer - prendre congé Remercier</p> <p>Grammaire : Les pronoms sujets - L'article défini et l'article indéfini - Conjugaison : Les verbes en- ER- Interroger - Répondre : Qu'est-ce que c'est ? / Qui est-ce ?</p> <p>Civilisation- L'espace francophone.</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
2	<p>Au travail</p> <p>Vous connaissez la chanson ? Répétitions : Nommer - Préciser - Exprimer ses goûts Demander quelque chose</p> <p>Grammaire : Masculin et féminin des adjectifs / pluriel des noms et des adjectifs Poser des questions - Conjugaison des autres verbes</p> <p>Civilisation- Première approche de la société française :</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
3	<p>On se détend ?</p> <p>Vous connaissez la chanson ? « - Fausses notes : Parler des loisirs / Parler de ses activités - Exprimer la possibilité, l'obligation - Proposer, Accepter, Refuser</p> <p>Grammaire : Passé récent, présent progressif ; Parler du futur : Future proche - Négation avec « du » et « de la » - Conjugaison des verbes : aller, venir, vouloir, pouvoir, savoir, devoir</p> <p>Civilisation : Repérage de quelques lieux de loisirs.</p> <p>Écriture : Cartes et messages d'invitation.</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

4	<p>Racontez-moi</p> <p>Vous connaissez la chanson ?</p> <p>Fugues : Raconter un emploi du temps passé - Dire cequ'on fait</p> <p>Grammaire : Passé composé - La date et l'heure</p> <p>Civilisation- Personnalités du monde francophone.</p> <p>Écriture : Rédaction d'un fragment de journal personnel</p>	<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
5	<p>Bon Voyage ; Bon appétit</p> <p>La traversée l'Hexagone</p> <p>Décision</p> <p>Présenter les avantages et les inconvénients d'une activité</p> <p>Grammaire : Les démonstratifs - Adjectifs possessifs Emploi des articles - Laforme négative - Exprimer la possession - Les questions générale / les mots interrogatifs avec inversion, Articles partitifs.</p> <p>Civilisation- Les transports en France. - Les habitudes alimentaires des Français.</p>	<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
6	<p>Self Study for Enrichment (Not to be included for External Examination)</p> <p>Comprehension passages, Translation from French to English, Translation from English to French.</p>	<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>

PEDAGOGY:

Blackboard, PPT, YOU TUBE links, Assignments, Quiz.

TEXT BOOK

S.NO	BOOK NAME	AUTHOR	PUBLISHERS	YEAR OF PUBLISHING
1	ECHO A1	J.Girardet/ J.Pêcheur	CLE INTERNATIO NAL	2017

Reference Books

ALTER EGO 1	Hachette- Français Langue Etrangère	GOYAL	2016
REFELTS 1	Guy Capelle, NoelleGid on	GOYAL	2017
APPRENON S LE FRANCAIS – 1,2, 3 &4	Simran Batra Mahitha Ranjit	NEW SARASWATHI HOUSE	2016
À Propos	Christine Andant, Chaterine Metton, Annabelle Nachon	Langers International pvt limited	2010
Saison 1	Delphine Ripaud	Didier	2015
Jumelage 1	Manjiri Khandekar, Roopa Luktuke	Langers International	2020

Web References

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www.simplefrench.com

www.apprenonslefrancais.com

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<https://www.thoughtco.com/french-4133079>

www.lecanardenchaîne.fr

<https://www.newsinslowfrench.com/>

Changes made in the syllabus

Deleted a couple of grammar topics

- Unit 3 : Les pronoms toniques
- Unit 5 : Les Comparatifs

And included

- Unit 3- Le présent progressif
 - Les messages- l'acceptance ou le refus
- Unit-5 – Les interrogatifs avec l'inversion

Part 1 - Basic French II

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22ULF2	BASIC FRENCH-II	Language	5	3

COURSE OBJECTIVES

- To stress on oral communication and listening comprehension
- To familiarize with the culture and civilization of the French speaking world
- To develop communicative tactics and vocabulary to improve oral expression
- To acquire the necessary skills for DELF A1 level

Course outcome and Cognitive Level Mapping

On successful completion of the course, the student will acquire the listed skills

CO	CO Statement	Knowledge level
CO1	To describe their daily routine using reflexive verbs.	K1
CO2	The students would be able to use the appropriate terms to describe their city, weather. Usage of prepositions.	K2
CO3	Talking about and writing about their families and memories.	K3
CO4	Discussing the mode of communication. Learning to write a short message.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	4	4	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	2	3	2
CO4	2	3	2	3	3	2	2	3	2	3
CO5	2	3	3	3	2	3	3	3	3	4

Syllabus

Unit	Content	hours	COs	Cognitive level
1	Quelle journée ! La traversée de l'Hexagone- Surprises : Raconter sa journée Grammaire : La conjugaison pronominale -		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

	<p>L'impératif - L'expression de la quantité (peu-un peu de-quelque-etc)</p> <p>Civilisation- Comportement en matière d'achat et d'argent.</p>			
2	<p>Qu'on est bien ici ! La traversée de l'Hexagone- Grosse fatigue : Parler d'un cadre de vie (lieu- climat- etc) - Décrire son logement Grammaire : Prépositions et adverbess de lieu - Verbes exprimant un déplacement (emploi des prépositions) Civilisation- Le climat en France.</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
3	<p>Souvenez vous Mon oncle de Bretagne- Le mystère des Dantec :Raconter brièvement un souvenir - Présenter sa famille - Faire brièvement la biographie d'une personne Grammaire :L'imparfait - Emplois du passé composé et de l'imparfait - Expression de la durée - L'enchaînement des idées (alors, donc, mais) - La sens réciproque Civilisation- Le couple et la famille.</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
4	<p>On s'appelle ? Mon oncle de Bretagne- Enquete à Saint-Malo :Parler des moyens de communication Grammaire :Passé composé avec les verbes pronominaux- L'expression de la fréquence et de la répétition</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>

5	<p>Un bon conseil ! À chacun son problème- Parler de ses activités de loisirs . Expression du déroulement de l'action – le futur simple with regular verbs, Passé récent - Présent progressif, Futur proche – Action achevée/ inachevée - Les phrases rapportées.</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
6	<p>Self Study for Enrichment (Not to be included for External Examination) Comprehension passages, Translation from French to English, Translation from English to French.</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

PEDAGOGY:

Blackboard, PPT, YOU TUBE links, Assignments, Quiz.

TEXT BOOK

S.NO	BOOK NAME	AUTHOR	PUBLISHERS	YEAR OF PUBLISHING
1	ECHO A1	J.Girardet/ J. Pécheur	CLE INTERNATIONAL	2017

Reference Books

ALTER EGO 1	Hachette- Français Langue " Etrangère	GOYAL	2016
REFELTS 1	Guy Capelle, NoelleGid on	GOYAL	2017
APPRENON S LE FRANCAIS- 3&4	Simran Batra Mahitha Ranjit	NEW SARASWATHI HOUSE	2016
À Propos 1	Christine Andant, Chaterine Metton, Annabelle Nachon	Langers International pvt limited	2010
Saison 1	Delphine Ripaud	Didier	2015
Jumelage 1	Manjiri Khandekar, Roopa	Langers International	2020

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<https://www.thoughtco.com/french-4133079>

www.lecanardenchaine.fr

<https://www.newsinslowfrench.com/>

Changes made in the syllabus

Unit 4

Réplacez le Passé composé avec les verbes pronominaux à place de *pronoms compléments directs* et les *pronoms compléments indirects*.

Unit 5- le futur simple avec les verbes réguliers.

**UG-French
II Year- I Semester
Part I- Intermediate French-I**

Semester III	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22ULF3	INTERMEDIATE FRENCH-I	Language	5	3

COURSE OBJECTIVES

- Demonstrate proficiency in speaking, understanding, reading, and writing skills
- Develop analytical skills that will allow them to read and write in French.
- To become familiar with various aspects such as history, society, political life and art.

Syllabus

Unit	Content	hours	COs	Cognitive level
1	<p>Vivement demain ! Ouverture-Faire des projets, Exprimer l'inquiétude- Rassurer, Faire une proposition. Grammaire-Le futur, La comparaison –des qualités, des quantités et des actions Civilisation- L'enseignement en France</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
2	<p>Tu as du boulot ? Ouverture-Choix et achat d'un vêtement, Exprimer des goûts et des préférences, Faire des suppositions Grammaire-Le pronom « en »-Le pronom « y »-Expression de la condition Civilisation-Le travail en France</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
3	<p>Qu'en pensez- vous ? Ouverture-Accuser/ défendre quelqu'un- Interdire / demander une autorisation-Proposer de faire quelque chose/ refuser/ insister Grammaire -Le subjonctif (emploi lié à quelques verbes)-Expression de la quantité (poids et mesure- évaluation- restriction) Civilisation-L'organisation administrative et politique de la France</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
4	<p>C'est tout un programme ! Ouverture-Donner des instructions-Porter un toast- Accueillir quelqu'un-</p>		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

	<p>Raconter une histoire- Choisir un programme Grammaire-Les propositions relatives introduites par « qui, que, où »-Les adverbes (place, formation des adverbes en-ment)-La forme « en+ participe présent » Civilisation-La télévision et la presse en France</p>			
5	<p>On se retrouve, C'est la fête ! Ouverture-Demander et donner des nouvelles de quelqu'un-Dire si on connaît, si on se souvient-Choisir une activité de loisir Grammaire-Emploi et conjugaison des quatre temps de l'indicatif : Présent, passé composé, imparfait et futur, Les pronoms objets directs-Les pronoms objets indirects. Civilisation-Les rencontres- modes et comportements-La vie de quartier dans les grandes villes-Les relations amicales</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
6	<p>Self-Study for Enrichment (Not to be included for External Examination) Comprehension passages, Translation from French to English, Translation from English to French.</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>

PEDAGOGY:

Blackboard, PPT, YOU TUBE links, Assignments, Quiz.

TEXT BOOK

S.NO	BOOK NAME	AUTHOR	PUBLISHERS	YEAR OF PUBLISHING
1	ECHO A2	J.Girardet/ J.Pêcheur	CLE INTERNATIO NAL	2017

Reference Books

ALTER EGO 2	Hachette- Français Langue Etrangère	GOYAL	2016
REFELTS 2	Guy Capelle, NoelleGid on	GOYAL	2017
Saison 2	Delphine Ripaud	Didier	2015
Jumelage 2	Manjiri Khandekar, Roopa	Langers International	2020
À Propos 2	Christine Andant, Chaterine Metton, Annabelle Nachon	Langers International pvt limited	2010
French in Paris- 3	Romain Rannou	Goyal Publishers	2022
Latitudes 2	<u>Régine</u> <u>Mérieux, Em</u> <u>manuel</u> <u>Lainé , Yves</u> <u>Loiseau</u>	Goyal Publishers	

Web References

1. <https://www.fluentu.com/>
2. <https://apprendre.tv5monde.com/fr>
3. <https://www.languageguide.org/french/>
4. <https://bonjourdefrance.com/>
5. <https://www.newsinslowfrench.com/>
6. <https://www.lecanardenchaine.fr/>
7. <https://www.rosettastone.com/languages/study-french>
8. <https://www.thoughtco.com/french-4133079>

UG- French
II Year- II Semester
Part I- Intermediate French-II

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22ULF4	INTERMEDIATE FRENCH-II	Language	6	3

COURSE OBJECTIVES

- To understand short, simple texts on familiar matters of a concrete type which consist of every day or job-related language.
- To follow speech that is very slow and carefully articulated, with long pauses for the student to assimilate meaning.
- To interact in a simple way but communication is totally dependent on repetition at a slower rate of speech.

Part-I INTERMEDIATE FRENCH II

CO	CO Statement	Knowledge level
CO1	Learning to give their opinion using the conditionnel present tense. Talking about an anecdote.	K1
CO2	The students would be able to describe the character of a person and their habitual life style. They would learn a little on the law of France.	K2
CO3	Discuss about their success and failure. Learning the sports played in France.	K3
CO4	The students will be able to discuss their habitual activities and their conditions in life. Writing or giving opinions on their daily life.	K4

Syllabus

Unit	Content	hours	COs	Cognitive level
1	Vous plaisantez ! Ouverture -Proposer quelque chose-Réagir à une proposition Grammaire -Le conditionnel présent-expression de l'hypothèse-demandes polies-suggestions et conseils Civilisation -L'Art au début du XXe siècle		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5
2	On s'entend bien ! Ouverture -Exprimer l'incompréhension-S'explique-Exprimer l'accord et le désaccord -Se réconcilierSe dire au revoir Grammaire -Les constructions du discours rapporté-Les constructions		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

	<p>« faire+verbe » et « laisser+verbe »</p> <p>Civilisation-Habitudes et interdits en France et dans le monde</p>			
3	<p>A vos risques et périls !</p> <p>Ouverture-Donner des directives -Exprimer la volonté et l'obligation-Exprimer l'inquiétude et la peur-Rassurer</p> <p>Grammaire-Le subjonctif présent-La construction passive pour mettre en valeur- L'objet direct de l'action</p> <p>Civilisation-Les Français et le sport -Les jeunes issus de l'immigration</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
4	<p>- La vie est dure</p> <p>Ouverture-Prendre contact avec quelqu'un-Avoir un entretien d'embauche-Exprimer l'appartenance-Exprimer la confiance ou la méfiance</p> <p>Grammaire : Les pronoms possessifs - Les adjectifs et les pronoms indéfinis</p> <p>Civilisation : Les Français et les tâches ménagères - La colocation</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>
5	<p>Que choisir ?- Je sais faire</p> <p>Ouverture :Choisir quelque chose - Exprimer une opinion sur une personne Se débrouiller dans une banque</p> <p>Grammaire : Les pronoms relatifs composés - Les constructions comparatives Les formes de l'appréciation : trop / pas assez - Les constructions - « verbe+verbe » - L'opposition des idées</p>		<p>CO1 CO2 CO3 CO4 CO5</p>	<p>K1, K2 K3, K4 K5</p>

	Civilisation : Comportements et habitudes en matière d'argent , Le Sécurité sociale - Les systèmes d'assurances			
6	Self Study for Enrichment (Not to be included for External Examination) Comprehension passages, Translation from French to English, Translation from English to French.		CO1 CO2 CO3 CO4 CO5	K1, K2 K3, K4 K5

PEDAGOGY:

Blackboard, PPT, YOU TUBE links, Assignments, Quiz

TEXT BOOK

S.NO	BOOK NAME	AUTHOR	PUBLISHERS	YEAR OF PUBLISHING
1	ECHO A2	J.Girardet/ J.Pêcheur	CLE INTERNATIO NAL	2017

Reference Books

ALTER EGO 2	Hachette-Français Langue Etrangère	GOYAL	2016
REFELTS 2	Guy Capelle, NoelleGidon	GOYAL	2017
Saison 2	Delphine Ripaud	Didier	2015
Jumelage 2	Manjiri Khandekar, Roopa	Langers International	2020
À Propos 2	Christine Andant, Chaterine Metton, Annabelle Nachon	Langers International pvt limited	2010
French in Paris- 3	Romain Rannou	Goyal Publishers	2022
Latitudes 2	<u>Régine Mérieux, Emmanuel Lainé, Yves Loiseau</u>	Goyal Publishers	

Web References

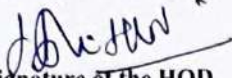
1. <https://www.fluentu.com/>
2. <https://apprendre.tv5monde.com/fr>
3. <https://www.languageguide.org/french/>
4. <https://bonjourdefrance.com/>
5. <https://www.newsinslowfrench.com/>
6. <https://www.lecanardenchaine.fr/>

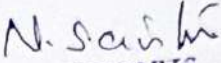
Unité 5- Remplacez les pronoms démonstratifs avec les pronoms relatifs composés.

Ratifications in the Academic Council Meet held in June'2022

Changes were asked to be made on the course titles which earlier were:

- Communication in French-I
- Communication in French II
- Communication in French III
- Communication in French IV


Signature of the HOD


Signature of the Dean
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMIL NADU

**CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
Annamalai Nagar, Trichy-18.**

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ISO 9001: 2015 Certified**



**DEPARTMENT OF OTHER LANGUAGES
SANSKRIT**

SEVENTH BOARD OF STUDIES MEET

2022-2023 and Onwards



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DEPARTMENT OF OTHER LANGUAGES
SANSKRIT
[7TH BOARD OF STUDIES MEET]

AGENDA

The Agenda for the Seventh Meeting of the Board of Studies are as follows:

ITEM NO. BOS/07/01

To consider and approve the curriculum and the Syllabus for II, III and IV semesters and of Part-1 Sanskrit for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM NO BOS/07/02

To suggest action plans for the enhancement of the students.

ITEM NO BOS/07/03

Any other item with the permission of the Chair. At the outset, the Chairman welcomed the members for attending the meeting of the Board of Studies (UG). Discussions based on the agenda were carried out.



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MINUTES OF THE SEVENTH MEETING OF BOARD OF STUDIES

DATE : 21st OCTOBER 2022
VENUE : Google Meet, NET Lab, Cauvery College for Women (Autonomous)
TIME : 12.00 Noon

[Google Meet joining info Video call link: <https://meet.google.com/aze-vidh-iex>

Or dial: (US) +1 307-543-1433 PIN: 518 090 770#

More phone numbers: <https://tel.meet/aze-vidh-iex?pin=6274040096066>]

MEMBERS PRESENT FOR THE SEVENTH BOARD OF STUDIES MEET

	Name	Designation
1	Dr.C.R.Sathyakannamani Assistant Professor of Sanskrit Cauvery College for women, Trichy-18.	Chairperson, Associate Professor
2	Dr. S. Usha Head and Associate Professor, Department of Sanskrit Seethalakshmi Ramasamy College, Tiruchirappalli -02.	Associate professor & Head, University Nominee Bharathidasan University, Trichy
3	Dr. P. Manikandan Assistant Professor of Sanskrit	Subject Representative, The Madura College (Autonomous) Vidhya Nagar, Madurai -625011
4	Dr. Latha Sreedhar Assistant Professor of Sanskrit	Subject Representative, Sri Sarada College for Women (Autonomous), Fairlands, Salem-636 016.
5	Sri Vidwan Varadhachari No.158, East Uttara Street, Srirangam, Tiruchirappalli -620006	From the Industry
6	Ms.S.RASIKA 36/69 KANDY STREET SRIRANGAM 620006	Student Alumnae



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**Minutes of the Seventh Board of Studies Meeting held
on 21-10-2022**

The meeting started with the prayer.

The following Resolutions were passed by the Board of Studies Members

ITEM NO: 1

To consider and approve the Curriculum and Syllabus for SANSKRIT.

The Committee discussed and approved the Syllabus for PART-1 SANSKRIT

"Resolved that to consider and approve the Curriculum and Syllabus for PART-1 SANSKRIT" Considered and approved the PSO, the Programme structure and Semester syllabus of II, III and IV and changes in the Semester I for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 with the following changes:

Semester II, III, IV : Full Révision made.

ITEM NO: 2

To suggest action plans for the enhancement of the students.

- To include more oral, written and listening activities to develop the communication of the students.
- To encourage and guide the interested students to take up Sanskrit as a career.
- Finally it was resolved as under

"Resolved that to consider and approve the Internal and External Evaluation System to be noted"

The leave of absence was granted to-

1. **Sri Vidwan Varadhachari , Member** from the Industry. No.158, East Uttara Street, Srirangam, Tiruchirappalli -620006
2. **Ms.S.RASIKA , Student Alumnae , 36/69 KANDY STREET, SRIRANGAM 620006**

The meeting ended with a vote of thanks to the chair.

Chairman
(Board of Studies)



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DEPARTMENT OF OTHER LANGUAGES - SANSKRIT
[Under-Graduate courses (I and II year)]

Part-I Language – Sanskrit

Programme Structure:

Sem.	Part	Course	Course code	Course Title	Hours / week	Exam Hours	Credits	Marks		
								CIA	ESE	Total
I	I	Sanskrit I	22ULS1	History of Popular Tales, Literature and Sanskrit Story	6	3	3	25	75	100
II	I	Sanskrit II	22ULS2	Poetry, Textual Grammar and Alankara	5	3	3	25	75	100
III	I	Sanskrit III	22ULS3	Prose, Textual Grammar and Vakyarachana	5	3	3	25	75	100
IV	I	Sanskrit IV	22ULS4	Drama, History of Drama Literature	6	3	3	25	75	100

Signature

N. Sanki
DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLEI - 620 018
TAMILNADU

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OUTCOME BASED EDUCATION SYLLABI

(2022-23)

DEPARTMENT OF OTHER LANGUAGES

SANSKRIT

[Under-Graduate courses (I and II year)]
Part-I Language - Sanskrit

VISION:

Sanskrit is the greatest treasure which India possesses and is her finest heritage. Sanskrit has played an important role in India's past and present which naturally foretells its role in India's future. Hence, disseminating the knowledge of the classical Sanskrit to the contemporary society to enable them to understand its rich heritage is considered significant.

The Nobel Laureate Physicist, Dr. C. V. Raman, believes that Sanskrit was the only language that could be the national language of India. He said, "Sanskrit flows through our blood. It is only Sanskrit that can establish the unity of the country."

MISSION:

- The department aims into preserve and promote the traditional Sanskrit texts as our heritage.
- To impart the moral and ethical values contained in the Dharmasastra and Nitisastra texts in the select Sanskrit literature.
- To design its curriculum on the basis of the feedback of students and Scholars of the subject to bring in more contemporary relevance to life.
- To endeavour to provide proper grounding to students in areas like literature , linguistics, philosophy, poetics, Sanskrita shastras etc. and
- To provide platform to pursue higher education in Sanskrit.
- To equip the graduates to get jobs in various educational institutions and Manuscript Libraries in Administrative and research level and to create Research scope in interdisciplinary mode.

PROGRAMME SPECIFIC OUTCOMES

On completion of Part I – Sanskrit Language programme the graduates will be able to:

- PSO1. learn Sanskrit alphabet without error with proper sound and learn to chant Sanskrit poetry with error free. The students will know our Sanatana Dharma through the stories.
- PSO2. learn about the history of Kalidasa and his Mahakavya and the Characteristics of Raghu clan through the story of Maharshi Kautsa. Also they have the knowledge about the Pride And to know about gnomic poems and Devotional lyrics of the Sanskrit poetry.
- PSO3. In this semester the students will learn about the basic structure of Samskrit Nataka and the one act play of Bhasa, Madhyamavyayoga. And finally they will try their basic conversation through Samskrit.
- PSO4. Focus to develop their speaking ability in Sanskrit, high imaginative skill and creativity to students. Educate learners using the online tools available in world wide web and give an outline about the research opportunity in Sanskrit Language.

PART -1 -SANSKRIT

Programme Structure:

Sem.	Part	Course	Course code	Course Title	Hours / week	Exam Hours	Credits	Marks		
								CIA	ESE	Total
I	I	Sanskrit I	22ULS1	History of Popular Tales, Literature and Sanskrit Story	6	3	3	25	75	100
II	I	Sanskrit II	22ULS2	Poetry, Textual Grammar and Alankara	5	3	3	25	75	100
III	I	Sanskrit III	22ULS3	Prose, Textual Grammar and Vakyarachana	5	3	3	25	75	100
IV	I	Sanskrit IV	22ULS4	Drama, History of Drama Literature	6	3	3	25	75	100

Semester I	Internal marks 25	External marks 75		
Course code	Course title	Category	Hrs/week	Credits
22ULS1	HISTORY OF POPULAR TALES LITERATURE AND SANSKRIT STORY	Language	6	3

Course Objective

- To describe the History of Popular Tales in Sanskrit literature.
- To understand the importance of our Sanatana Dharma through stories.
- To gain knowledge about our Ancient culture.
- To know the basic grammar of Sanskrit Literature.

Course Outcome and Cognitive Level Mapping :

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts and understand the basic grammar of Sanskrit Language.	K1&K2
CO2	Justify our ancient culture and dharma through stories	K6
CO3	Analyze the grammatical concepts and apply to making the sentences	K4
CO4	Admire about the History of Sanskrit Drama	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	2	2	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3

"1" – Slight (Low) Correlation

"3" – Substantial (High) Correlation

"2" – Moderate (Medium) Correlation

"-" indicates there is no correlation.

SYLLABUS - SEMESTER -I

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction of the classification of words in Sanskrit. Identification of the Nouns in three genders and in three numbers. [लिङ्गत्रयम् – वचनत्रयम्] अकारान्त- इकारान्त- ईकारान्त – उकारान्त- तकारान्त-सकारान्त शब्दाः ।	16	CO1	K1,K2,K3
II	Classifications of verb roots. Identification of the verbs in three persons and in three numbers. [पुरुषत्रयम्-वचनत्रयम्]परस्मैपदि(५), आत्मनेपदि(५), उभयपदि(२)	16	CO1	K3,K2,K6
III	History of Popular Tales and Fables.	16	CO4	K1,K2,K3,K4
IV	कथावल्ली - 1. सत्यमेव विजयते 2. उत्तमः धर्मः 3. प्रश्नत्रयम् 4. शर्मिष्ठा 5. अप्रशिख	21	CO1, CO5	K1,K2,K3,K4 ,K5
V	कथावल्ली - 8. चतुरः शशकः 7. दुष्टैः सह वासः 8. सत्यानास्ति परो धर्मः 9. दृष्टिभेदः 10. ध्रुवचरितम्	21	CO1, CO5	K1,K2,K3,K4 ,K5
VI	Self Study for Enrichment (Not to be included for External Examination) Sanskrit – Infant Reader - Samskrita Baladarsha https://archive.org/details/Samskrita_Baladarsa_Prathamadarsa_Dvitiyadarsa_and_Tritiyadarsa_KLV_Sastri_RS_Vadhyaar__Sons . https://openpathshala.com/course/3/sanskrit-grammar-basics . https://play.google.com/store/apps/details?id=com.vyoma.sandhi&hl=en_US&gl=US Sanskrit - Basic Grammar https://learnsanskritonline.com/ -	-	CO1	K1, K2, K6

TEXT BOOKS

S.N O	AUTHOR/ EDITOR	TITLE	PUBLISHERS	YEAR OF PUBLICA TION
1	Dr.K.V.Ramakrish -namacharya	Kathavallari	Sanskrita Bhasha Pracharini Sabha, Chittoor-517001	2008
2	T.K.Ramachandra Aiyar	A Short History of Sanskrit Literature	R.S.Vadhyar & Sons Kerala	2015
3	T.K.Ramachandra Aiyar	Sabdamanjari and Dhatumanjari	R.S.Vadhyar & Sons Kerala	2015

REFERENCE BOOKS

1.	संस्कृतप्रदीपिका -प्रथम पुस्तकम् , Publisher : Pandit K.S.Parameswara Sastry, Irinjalakuda (Kerala). Eleventh Edition 1968
2.	SabdaManjari, Published by R.S.Vadhyar & Sons, Kalpathy, Palghat, 2015.
3.	DhaturupaManjari, Published by R.S.Vadhyar & Sons, Kalpathy, Palghat, 2015.

PEDAGOGY

Teaching chalk and Talk method. Action play , ICT and Recitation.

COURSE DESIGNER : Dr.C.R.Sathyakannamani

C.R. Sathi

Dr. S. Ramalakshmi
23/11/22

Dr.S.Ramalakshmi

Vice Principal Professor & Head

N. Savithri

Dr. N. Savithri

Dean of Arts, Professor & Head
DEAN OF ARTS
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(AUTONOMOUS)
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TIRUCHIRAPPALLI - 620 018
TAMILNADU

Semester II	Internal marks 25	External marks 75		
Course code	Course title	Category	Hrs/week	Credits
22ULS2	Poetry, Textual Grammar and Alankara	Language	5	3

COURSE OBJECTIVE

- To describe the History of Mahakavyas in Sanskrit literature.
- To understand the story of Raghuvamsam .
- To gain knowledge about Textual Grammar.
- To know the basic concept Alankaras in Sanskrit Literature.

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the history of Sanskrit literature	K1&K2
CO2	Discuss about the story of Raghuvamsa and Kautsa Rishi	K2
CO3	Analyze the Textual grammar of Raghuvamsa	K4
CO4	Classify and define the alankaras of Sanskrit poetry	K3

MAPPING OF CO WITH PO AND PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	2	3	2	2	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3

"1" – Slight (Low) Correlation

"3" – Substantial (High) Correlation

"2" – Moderate (Medium) Correlation

"-" indicates there is no correlation.

SYLLABUS - SEMESTER -II

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Mahakavyas –Origin and Development (Page 64-84)	9	CO1	K1,K2,K3
II	रघुवंशम् – पञ्चमसर्गः (1-15) श्लोकाः ।	18	CO1	K3,K2,K6
III	रघुवंशम् – पञ्चमसर्गः (16-35) श्लोकाः ।	18	CO4	K1,K2,K3,K4
IV	Textual Grammar of Raghuvamsam-5th chapter(1-35)shlokas.	15	CO1, CO5	K1,K2,K3
V	Introduction about the Alankara and Alankaras - उपमा , रूपकम्, उत्प्रेक्षा , परिकरः , दीपकम् , दृष्टान्तः, व्यतिरेकः, श्लेषः ।	15	CO1, CO5	K1,K2,K3,K4
VI	Self Study for Enrichment (Not to be included for External Examination) Sanskrit - Basic Grammar-The Sanskrit Channel - http://www.learnsanskrit.org/grammar	-	CO1	K1, K2, K6

TEXT BOOKS

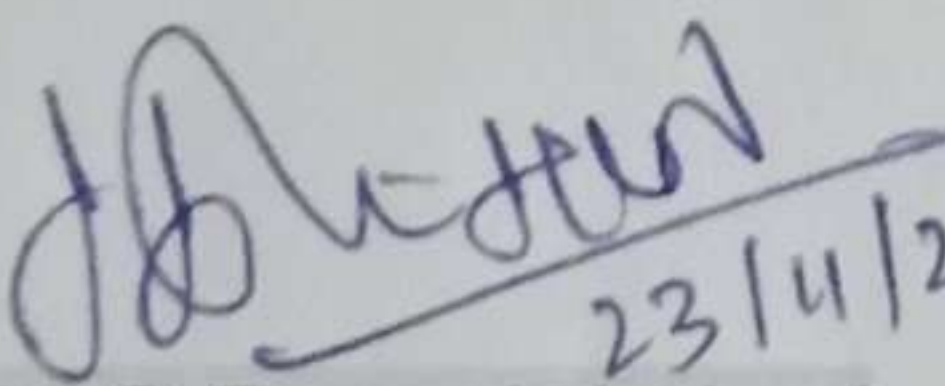
1	The Raghuvamsa of Kalidasa, with notes by M.R.Kale, Gopal Narayen & Co. Bombay, 1922.
2	A Short History of Sanskrit Literature , T.K.Ramachandra Aiyar , R.S.Vadhyar & Sons Kerala , 2015
3	Candraloka of Jayadeva

WEB REFERENCES

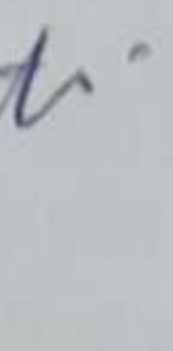
1.	https://archive.org/details/Sanskrita-Swadhyaya/1st%20level%20-%201%20-%20vakya-vyavahara
2.	https://www.sanskritfromhome.in/
3.	http://www.sanskritebooks.org/ebooks-download/

PEDAGOGY : Teaching chalk and Talk method. Action play , ICT and Recitation.

COURSE DESIGNER : Dr.C.R.Sathyakannamani


23/4/22
Dr.S.Ramalakshmi

Vice Principal Professor & Head


Dr. N. Savithri
DEAN OF ARTS
DEAN OF ARTS, PROFESSOR & HEAD
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

Semester III	Internal marks 25	External marks 75		
Course code	Course title	Category	Hrs/week	Credits
22ULS3	Prose, Textual Grammar and Vakyarachana	Language	5	3

COURSE OBJECTIVE

- To describe the History of Prose in Sanskrit literature.
- To understand the story of Balaramayanam.
- To gain knowledge about Textual Grammar of Balabharatam
- To learn the Active voice and Passive voice in Sanskrit Literature.

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the History of prose.	K1&K2
CO2	Understand the deviations of Balaramayanam from the Original.	K2
CO3	remember the grammar rule from the textual grammar.	K4
CO4	To identify the voice in a sentence.	K3

MAPPING OF CO WITH PO AND PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	2	3	2	2	3	2	3	2	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	3	3	2	3	3	3

"1" – Slight (Low) Correlation

"3" – Substantial (High) Correlation

"2" – Moderate (Medium) Correlation

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SYLLABUS - SEMESTER -III

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	History of Prose Literature.	14	CO1	K1,K2,K3
II	बालरामायणम् - बालकाण्डम्-१	21	CO1	K3,K2,K6
III	बालरामायणम् - बालकाण्डम्-२	21	CO4	K1,K2,K3,K4
IV	Textual Grammar of Balaramayanam - Balakandam.	21	CO1, CO5	K1,K2,K3
V	प्रयोगनिरूपणम् - voices ; कर्तरि - कर्मणि - भाव प्रयोगाः ।	13	CO1, CO5	K1,K2,K3,K4
VI	<p>Self Study for Enrichment (Not to be included for External Examination)</p> <p>1. Sanskrit - Basic Grammar : The Sanskrit Channel -- http://www.learnsanskrit.org/grammar https://openpathshala.com/course/3/sanskrit-grammar-basic</p> <p>2. Prose Literature : https://en.wikipedia.org/wiki/Sanskrit_literature</p> <p>3. Sri Ramayanam : https://www.valmiki.iitk.ac.in</p>	-	CO1	K1, K2, K6

TEXT BOOKS

	Text Book(s)
1	बालरामायणम् (Balaramayanam) of Rajasekara. by P.S. Ananthanarayana Sastry , Published by R.S Vadhyar & Sons kalpathi, Palakkad. 1989.
2	A Short History of Sanskrit Literature, T.K.RamachandraAiyar, Published by R.S. Vadhyar& Sons, Kalpathy, Palghat, 2002
3	Sabdamanjari and Dhatumanjari , T.K.RamachandraAiyar, Published by R.S. Vadhyar& Sons, Kalpathy, Palghat, 2015

WEB REFERENCES

c. Reference Books	
1.	A History of Sanskrit Literature- January 2016 , by Arthur Anthony Macdonell.
2.	A History of Sanskrit Literature-1 January 2015, by Arthur A Macdonell.
3.	SabdaManjari, Published by R.S. Vadhyar & Sons, Kalpathy, Palghat, 2015.
4.	DhaturupaManjari, Published by R.S. Vadhyar & Sons, Kalpathy, Palghat, 2015.

PEDAGOGY : Teaching chalk and Talk method. Action play , ICT and Recitation.

COURSE DESIGNER : Dr.C.R.Sathyakannamani

C.R. Sath

Dr. S. Ramalakshmi
23/11/22

Vice Principal Professor & Head

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SYLLABUS - SEMESTER -IV

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction about Bhasa, Drama, मध्यमव्यायोगः - एकाङ्करूपकम् - summary and character sketches. (pages iii-xxxii) श्री भासप्रणीतः मध्यमव्यायोगः (pages 1-16)	15	CO1	K1, K2
II	श्री भासप्रणीतः मध्यमव्यायोगः - एकाङ्करूपकम् - (pages 17-25)	20	CO1	K1, K2, K3,
III	श्री भासप्रणीतः मध्यमव्यायोगः - एकाङ्करूपकम् - (pages 26-48)	18	CO4	K1, K2, K3,
IV	History of Drama Literature – Origin –development – Authorship of the Trivandrum plays	12	CO1, CO5	K1, K2, K3, K4, K5, K6
V	History of Drama Literature -Dramas of other authors – Types –characteristics of Sanskrit Drama	10	CO1, CO5	K1, K2, K3, K4,
VI	<p>Self Study for Enrichment (Not to be included for External Examination)</p> <p>1. History of Drama Literature-The Drama Origin-Development of Sanskrit Drama https://en.wikipedia.org/wiki/Drama</p> <p>2. The Plays of Bhāsa Thirteen Plays of Bhasa: by A. C. Woolner, LakshmanSarup Sanskrit Drama - IV (Bhasa) https://www.youtube.com/watch?v=fcd36JbEdPc</p> <p>JOURNAL ARTICLE - Three Plays of Bhasa in the Trivandrum Sanskrit Series by A. A. MacDonell The Journal of the Royal Asiatic Society of Great Britain and Ireland(Jan., 1913), pp. 186-190 (5 pages) Published By: Cambridge University Press https://www.jstor.org/stable/25188941</p>	-	CO1	K1, K2, K6

TEXT BOOKS

	Text Book(s)
1.	श्री भासप्रणीतः मध्यमव्यायोगः - एकाङ्करूपकम् Sri T.K.Ramachandra Aiyar, M.A., B.O.L., Published by R.S. Vadhyar & Sons, Kalpathy, Palghat, 2003.
2.	A Short History of Sanskrit Literature, T.K.Ramachandra Aiyar, Published by R.S. Vadhyar & Sons, Kalpathy, Palghat, 2002
3.	Chanakya Neeti (Chanakya's Aphorism on Morality), B.K.Chaturvedi Publisher : Diamond Pocket Books (P) LTD., New Delhi. 2004

WEB REFERENCES

	Reference Books
1.	A History of Sanskrit Literature- January 2016 , by Arthur Anthony Macdonell.
2.	A History of Sanskrit Literature-1 January 2015, by Arthur A Macdonell.
3.	<u>Notes on Bhasa's Play Madhyama Vyayoga - Mahabharata</u> http://mahabharata-resources.org/nmv
4.	The Natyashastra by Bharata-muni https://en.wikipedia.org/wiki/Natya_Shastra

PEDAGOGY : Teaching chalk and Talk method. Action play , ICT and Recitation.

COURSE DESIGNER : Dr.C.R.Sathyakannamani

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PG DEPARTMENT OF ENGLISH

SEVENTH BOARD OF STUDIES

MEET

2022-2023 and Onwards



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PG DEPARTMENT OF ENGLISH

AGENDA

The Agenda for the Seventh Meeting of the Board of Studies are as follows:

1. ITEM NO. BOS/07/01

To consider and approve the Programme Structure and syllabus for I and II Semesters of BA English Core Courses and Allied papers of 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

2. ITEM NO. BOS/07/02

To consider and approve the introduction of Internship as an Extra Credit Course in Semester V of 2021-2024 Batch and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

3. ITEM NO. BOS/07/03

To consider and approve the Programme Structure and Syllabus for I and II Semesters of MA English Core Courses, Core Choice Courses and Discipline Specific Electives and Generic Elective Courses of 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

4. ITEM NO. BOS/07/04

To express appreciation to the members of the Board of Studies for their contribution in the ground plans of the Syllabus (Academic Curriculum) and to forward it to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.



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MINUTES OF THE SEVENTH MEETING OF BOARD OF STUDIES

DATE: 14th OCTOBER 2022

VENUE: Aural Oral English Lab, Cauvery College for Women (Autonomous)

TIME: 10.00 am

MEMBERS PRESENT FOR THE SEVENTH BOARD OF STUDIES MEET

S.No	Name	Designation
1	Dr. P. Urmila	PG. Chairperson and Associate Professor
2	Dr.S.Jayashree Agarwal	UG Chairperson and Assistant Professor
3	Dr. B. Sivakami	Subject Expert, VIT, Chennai.
4	Dr.O. T. Poongodi	Subject Expert, Government Arts and Science College Komarapalayam
5	Dr. A.Selvam	University Nominee, Central University of Tamil Nadu, Tiruvarur.
6	Dr.Justin James	International Academic Expert, University of Technology and Applied Science Nizwa, Sultanate of Oman
7	Ms.Jeraltin Vency	Industrial Representative, Founder Marathon Academy, Expert in English Language Teaching & Training and Career Guidance Counsellor. Palakkarai, Trichy
8	Dr. Raghavi Ravi Kasthuri	Postgraduate Meritorious Alumnus, Assistant Professor, VIT- AP University, Amaravati, AP
9	Two Students Representatives	Two PG Students
10	Dr. Uma Maheswari	Member
11	Dr. Rita Shanthakumar	Member
12	Dr. Prema Joshua	Member
13	Dr. P. Helan Jona	Member
14	Dr. G.Gayathri	Member
15	Dr.Cecilia Merlin Wilton	Member
16	Ms. A.Violet Pangaja Bai	Member
17	Ms. K.Kanimozhi	Member
18	Ms. J.Jenifer Nancy	Member

19	Ms.Chithra	Member
20	Ms. Diana Betty Garret	Member
21	Ms. S. Ramalakshmi	Member
22	Ms. R. Shanthi	Member
23	Ms. P. K. Durgadevi	Member
24	Ms. T. Haseena Banu	Member
25	Ms. V. Sudhandra Devi	Member
24	Ms. U. Sree Aruna	Member
25	Ms. A. Edel Flora Mary	Member
26	Ms. N. Yoga	Member
27	Ms. L. Samyuktha	Member
28	Ms. G. Vijayarenganayaki	Member
29	Dr. S. Senthil Kumari	Member
30	Dr. R. Vanitha	Member
31	Ms. Vanmathi. Siva	Member
32	Ms. T. Mothika	Member
33	Ms. M.Irudhaya Pushpam	ABSENT
34	Ms. J. Vanipriya	ABSENT
35	Ms.Srinidhi	ABSENT



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PG DEPARTMENT OF ENGLISH

ACTION TAKEN REPORT OF THE SIXTH MEETING OF
THE BOARD OF STUDIES HELD ON 06/05/2022

The Sixth Meeting of the Board of Studies was held through Online Mode (Google Meet) on 06/05/2022. All the five external members were present. The Resolution in BOS/06/01 with regard to UG Semester V on Skill Enhancement Course, English for BPO and English for Career Advancement were introduced.

In PG the Elective paper I Linguistics and Rhetoric is modified to Rhetoric and Stylistics (2022-2023 batch and onwards) and also the topics were modified in the Core Courses – Shakespeare, Indian English Literature, and Black Women's Writing in English Literature and thereby forwarded to the Academic Council and implemented successfully.



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PG DEPARTMENT OF ENGLISH

Minutes of the Seventh Board of Studies Meeting held on 14/10/2022

The following Resolutions were passed by the Board of Studies Members

1. Resolution No. BOS/07/01

The Programme Structure and the Syllabus for BA English (2022- 2023) batch and onwards were considered and approved to forward to the Academic Council with the following recommendations to provide a broader scope for the young minds for higher learning and better prospects.

Revision of Syllabus of UG in Semester II in English Language Course II – 22UE2 – Functional English for Effective Communication II

Topic Added

- i) Unit III - SOP - Statement of Purpose is included.
- ii) Reference Book - Mike Markel's *Technical Communication* is recommended.

Revision of Syllabus of UG in Semester II in Core Course IV -22UEN2CC4 – Fiction

Topics Modified

- i) Unit III – Bama Faustina Soosairaj – Karukku is included
- ii) Unit VI – Subhash Vyam Durgabai Vyam – Bhimayana: Experiences of Untouchability is included

2. Resolution No. BOS/06/02

Considered and approved for the introduction of Internship as an Extra Credit Course in 2021-2024 batch for BA English in Semester V

3. Resolution No. BOS/07/03

The Programme Structure and the Syllabus of MA English along with the Self - Study Unit is introduced to empower the students of 2022-2023 batch onwards was considered, approved and forwarded to the Academic Council after carrying out the corrections and recommendations in the Core Course, Core Choice Course and Discipline Specific Elective Course and Generic Elective Courses to provide a holistic approach thereby to brighten the future prospects of higher learning.

As per the Recommendations made by the Board of Studies Members, the suggestions and changes in the syllabus have been carried out in the following papers:

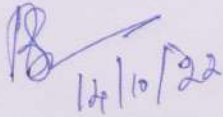
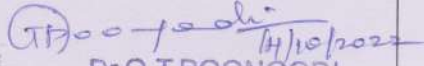
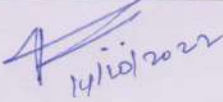
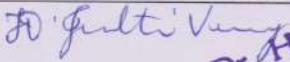

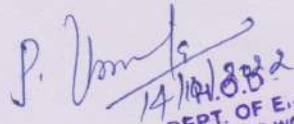
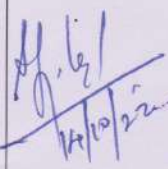
- i) Core Course VII (CC)- 22PEN2CC7 – American Literature
- ii) Core Choice Course – 1 (CCC) – 22PEN2CCC1B – Commonwealth Literature
(Title of the paper Commonwealth Theories and Criticism is changed to Commonwealth Literature)
- iii) Core Choice Course – I (CCC) – 22PEN2CCC1C – Skill Enhancement
- iv) Discipline Specific Elective Course II (DSE) – 22PEN2DSE2A – English Language Teaching

4. Resolution No. BOS/07/04

The members of the Board of Studies were thanked by the Chairperson, PG Head, and Department of English Dr.P.Urmila for their presence and rendered her gratitude for the suggestions recommended for PG. Dr.S.Jayashree Agarwal, UG Head expressed her gratitude for the valuable suggestions for 2022-2023 batch and onwards to the Board of Studies Members.

The Board of Studies meeting was resolved and concluded recommending the programme structure and the syllabus of I & II Semesters of BA and MA English of 2022-2023 batch and onwards to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

Members of the Seventh Board of Studies Meet

<p>Dr. B. Sivakami Assistant Professor Department of English VIT, Chennai</p>	 14/10/22
<p>Dr. T. Poongodi Assistant Professor, PG Department of English Government Arts and Science College Komarapalayam-638183</p>	 14/10/2022 Dr.O.T.POONGODI M.A.,M.Phil.,B.Ed.,PGDCA.,Ph.D. Assistant Professor, PG Department of English Government Arts and Science College Komarapalayam.
<p>Dr. A.Selvam Professor & Head, Department of English Central University of Tamil Nadu, Tiruvarur.</p>	 14/10/2022
<p>Dr. Justin James Lecturer, English Language Centre University of Technology and Applied Science Nizwa, Sultanate of Oman</p>	Joined on - online mode.
<p>Ms. Jeraltin Vency Founder Marathon Academy, Expert in English Language Teaching & Training and Career Guidance Counsellor. Palakkarai, Trichy</p>	 Dr. H. JERALTIN VENCY Director, Marathon Academy No.14/1, Chennai Towers, Jallanipeta 1st Street, Subramaniyapuram, Trichy - 620 020.
<p>Dr. Ragavi Ravi Kasthuri Assistant Professor, VIT-AP School of Social Sciences and Humanities (VISH) Vellore Institute of Technology, Andhra Pradesh (VIT- AP University), Amaravati, AP</p>	 14/10/22
<p>Dr. P. Urmila Associate Professor PG Head, Department of English, Cauvery College for Women (Autonomous) Trichy-18</p>	 14/10/2022 DEPT. OF ENGLISH CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) TRICHY - 620 018.
<p>Dr.S.Jayashree Agarwal Assistant Professor UG Head, Department of English, Cauvery College for Women (Autonomous) Trichy-18</p>	 14/10/22 H.O.D - UG DEPT. OF ENGLISH CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) TRICHY - 620 018.

S.No	Name	Designation	Signature
1	Dr. Uma Maheswari . R	Member	
2	Dr. Rita Shanthakumar	Member	
3	Dr. Prema Joshua	Member	
4	Dr. P. Helan Jona	Member	
5	Dr. G.Gayathri	Member	
6	Dr.Cecilia Merlin Wilton	Member	
7	Ms. A. Violet Pangaja Bai	Member	
8	Ms. K.Kanimozhi	Member	
9	Dr. J.Jenifer Nancy	Member	
10	Ms.Chithra	Member	
11	Ms. Diana Betty Garret	Member	
12	Ms. S. Ramalakshmi	Member	
13	Ms. R. Shanthi	Member	
14	Ms. P. K. Durgadevi	Member	
15	Ms. T. Haseena Banu	Member	
16	Ms. V. Sudhendra Devi	Member	
17	Ms. U. Sree Aruna	Member	
18	Ms. A. Edel Flora Mary	Member	
19	Ms. N. Yoga	Member	
20	Ms. L. Samyuktha	Member	
21	Ms. G. Vijayarenganayaki	Member	
22	Dr. S. Senthil kumari	Member	
23	Dr. R. Vanitha	Member	
24	Ms.Vanmathi. Siva	Member	
25	Ms.T. Mothika	Member	
26	Ms. J. Vanipriya	Member	Absent
27	Ms. M.Irudhaya Pushpam	Member	Absent
28	Ms.Srinidhi	Member	Absent

Student Representatives			
1	Ms.M. Menaka	II MA English	
2	Ms.T.Archana	I MA English	

Dr.P.Urmila PG Head, Department of English Cauvery College for Women (Autonomous) Trichy-18	Dr.S.Jayashree Agarwal UG Head, Department of English Cauvery College for Women (Autonomous) Trichy-18	Dr.N.Savithri Dean of Arts, Cauvery College for Women (Autonomous) Trichy-18

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH "A" GRADE BY NAAC
ISO 9001: 2015 CERTIFIED
TIRUCHIRAPPALLI**

PG DEPARTMENT OF ENGLISH



B.A ENGLISH

SYLLABUS

2022- 2023 AND ONWARDS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF ENGLISH

VISSION

- The Department of English envisions the learners to explore and empower LSRW skills there by gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUT COMES FOR BA ARTS (TAMIL, ENGLISH AND SOCIAL WORK PROGRAMME)

PO NO.	PROGRAMME OUT COMES On completion of BA Programme, the students will be able to
PO1	Possess thorough knowledge of language and understand the concerns of the society in real situations and work environment. (Academic Excellence with Social Thinking)
PO2	Express thoughts and ideas effectively using appropriate texts, media and evaluate practices, policies and theories by applying scientific and social approaches. (Skilled Proficiency)
PO3	Acquire training skills in research, internships and foster team spirit in the global world and face the challenges in a multicultural society. (Team Building and Problem Solving)
PO4	Relate and apply exemplary role models/writers and their values to elucidate different kinds of unknown problems. (Leadership Traits & Critical Thinking)
PO5	Inculcate lifelong learning by fostering scientific attitude aimed at personal and societal development to meet the changing demands of work and career through knowledge and skills. (Situational Approach and Lifelong Learning)

PROGRAMME SPECIFIC OUT COMES FOR BA ENGLISH

PSO NO.	PROGRAMME SPECIFIC OUTCOMES Students of BA English will be able to	POs Addressed
PSO 1	Gain competence and confidence in acquiring LSRW skills in English Language and Literature to face the realities of life.	PO1
PSO 2	Empower and appreciate knowledge of various genres of literature and develop an eclectic taste to appreciate the literary movements, cultural and social contexts in relation with the society and the world.	PO2 PO3
PSO 3	Explore and analyse the works of the writers from political, historical, ethical and sociological perspectives for higher learning and research.	PO3
PSO 4	Attain proficiency to solve the complexities of human life through various genres of literature till the present modern age and train them to be socially committed citizens.	PO1 PO4
PSO 5	Achieve in depth knowledge to comprehend communication skills, linguistics, journalism and literature in different modes of learning to gain job opportunities for a better self and society.	PO5



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

PG DEPARTMENT OF ENGLISH

BA ENGLISH - Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

I SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ Week	Credits	Exam			Total	
							Hours	Marks			
								Int.	Ext		
I	I	Language Course - I(LC) - Tamil*/ Other Languages*	Ikkala Ilakiyam - I	22ULT1	6	3	3	25	75	100	
			Hindi Literature & Grammar - I	22ULH1							
			History of Popular Tales, Literature and Sanskrit Story	22ULS1							
			Basic French - I	22ULF1							
	II	English Language Course - I (ELC)	Functional English for Effective Communication - I	22UE1	6	3	3	25	75	100	
	III	Core Course - I (CC)	Prose	22UEN1CC1	6	6	3	25	75	100	
			Core Course - II (CC)	Short Stories	22UEN1CC2	6	6	3	25	75	100
			First Allied Course - I (AC)	Social History of England	22UEN1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - I (AECC)	UGC - Jeevan Kaushal Universal Human Values	22UGVE	2	2	-	100	-	100	
	Total					30	23				600

II SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ Week	Credits	Exam			Total	
							Hours	Marks			
								Int.	Ext		
II	I	Language Course - II (LC) - Tamil*/ Other Languages*	Idaikala Ilakiyamum Pudhinamum	22ULT2	5	3	3	25	75	100	
			Hindi Literature & Grammar - II	22ULH2							
			Poetry, Textual Grammar and Alakara	22ULS2							
			Basic French - II	22ULF2							
	II	English Language Course - II (ELC)	Functional English for Effective Communication -II	22UE2	6	3	3	25	75	100	
	III	Core Course - III (CC)	Poetry - I	22UEN2CC3	6	6	3	25	75	100	
			Core Course - IV (CC)	Fiction	22UEN2CC4	6	6	3	25	75	100
			First Allied Course - II (AC)	Literary Forms	22UEN2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
	Extra Credit Course			SWAYAM	As per UGC Recommendation						
Total					30	23				600	



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

**PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure**

**LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)**

III SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
III	I	Language Course - III (LC) - Tamil*/ Other Languages*	Kapiyamum Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar - III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French - I	22ULF3						
	II	English Language Course - III (ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100
	III	Core Course - V (CC)	One Act Plays	22UEN3CC5	6	6	3	25	75	100
		Core Course - VI (CC)	Poetry - II	22UEN3CC6	5	5	3	25	75	100
		Second Allied Course - I (AC)	History of English Literature - I	22UEN3AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Generic Elective Course - I (GEC)	Presentation Skills in English	22UEN3GEC1	2	2	3	25	75	100
Basic Tamil - I			22ULC3BT1							
Special Tamil - I			22ULC3ST1							
Extra Credit Course	SWAYAM		As per UGC Recommendation							
Total				30	23				700	
15 DAYS INTERNSHIP DURING SEMESTER HOLIDAYS										

IV SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC) - Tamil*/ Other Languages*	Pandaiya Illakiyam	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French - II	22ULF4						
	II	English Language Course - IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course - VII (CC)	Drama	22UEN4CC7	5	5	3	25	75	100
		Core Course - VIII (CC)	Introduction of Language and Linguistics	22UEN4CC8	5	5	3	25	75	100
		Second Allied Course - II (AC)	History of English Literature - II	22UEN4AC4	4	3	3	25	75	100
		Internship	Internship	22UEN4INT	-	2	-	-	-	100
	IV	Generic Elective Course - II (GEC)	Communication Skills in English	22UEN4GEC2	2	2	3	25	75	100
Basic Tamil - II			22ULC4BT2							
Special Tamil -II			22ULC4ST2							
V	Skill Enhancement Course - I (SEC)	Public Speaking (P)	22UEN4SEC1P	2	2	3	40	60	100	
Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total				30	25				800	



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

PG DEPARTMENT OF ENGLISH

BA ENGLISH - Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

V SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
V	III	Core Course IX (CC)	Shakespeare	22UEN5CC9	6	6	3	25	75	100
		Core Course X (CC)	Principles of Literary Criticism	22UEN5CC10	5	5	3	25	75	100
		Core Course XI (CC)	American Literature	22UEN5CC11	5	5	3	25	75	100
		Core Course XII (CC)	Women's Writing in English	22UEN5CC12	5	5	3	25	75	100
		Discipline Specific Elective - I (DSE)	A. Diasporic Literature	22UEN5DSE1A	5	4	3	25	75	100
	B. Translation: Theory and Practice		22UEN5DSE1B							
	C. World Classics in Translation		22UEN5DSE1C							
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC Jeevan Kaushal- Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course - II (SEC)	English for BPO (P)	22UEN5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendations					
Total				30	29					700

VI SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hours	Marks		
								Int	Ext	
VI	III	Core Course XIII (CC)	English Language Teaching	22UEN6CC13	4	4	3	25	75	100
		Core Course XIV (CC)	Indian Writing in English	22UEN6CC14	5	5	3	25	75	100
		Core Course XV (CC)	Commonwealth Literature	22UEN6CC15	5	5	3	25	75	100
		Core Course XVI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective - II (DSE)	A. Journalism	22UEN6DSE2A	5	4	3	25	75	100
			B. Content Writing	22UEN6DSE2B						
			C. Phonetics	22UEN6DSE2C						
	Project	Project Work	22UEN6PW	5	3	-	-	100	100	
	V	Ability Enhancement Compulsory Course-V(AECC)	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension Activity		22UGEA	-	1	-	-	-	-
Total				30	27					700
GRAND TOTAL				180	150					4100

COURSES & CREDITS FOR UG PROGRAMME

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/Other Languages	4	12	12
II	English	4	12	12
III	Core Courses	16	84	109
	Project Work	1	3	
	Internship	1	2	
	First Allied–Allied Course (AC)	2	6	
	Second Allied–Allied Course (AC)	2	6	
	Discipline Specific Elective (DSE)	2	8	
IV	Generic Elective Course (GEC)	2	4	15
	Skill Enhancement Course (SEC)	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II- Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV-Professional Skills	1	2	
V	AECC-V-Gender Studies	1	1	02
	Extension Activities	-	1	
	Total	41		150

Signature		
Name & Designation	Dr. S. Jayashree Agarwal HOD	Dr.N.Savithri Dean



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.

PG DEPARTMENT OF ENGLISH

BA ENGLISH - Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2022 -2023 onwards)

I SEMESTER

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext.	
I	I	Language Course – I (LC) – Tamil/ Other Languages	Ikkala Ilakiyam– I	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar - I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French - I	22ULF1						
	II	English Language Course- I (ELC)	Functional English for Effective Communication– I	22UE1	6	3	3	25	75	100
	III	Core Course- I (CC)	Prose	22UEN1CC1	6	6	3	25	75	100
				22UEN1CC2	6	6	3	25	75	100
				22UEN1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal – Universal Human Values	22UGVE	2	2	-	100	-	100
	Total					30	23			

Signature		
Name & Designation	Dr. S. Jayashree Agarwal HOD	Dr. N. Savithri Dean

Semester I	Internal Marks: 25	External Marks:75		
COURSECODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UE1	FUNCTIONAL ENGLISH FOR EFFECTIVE COMMUNICATION I	ENGLISH LANGUAGE COURSE I	6	3

COURSE OBJECTIVES

- To enhance Vocabularies and Sentences for Effective Communication
- To express and practice the language through personal experience and expressions
- To reinforce the approach through Writing and Self-Assessment
- To understand usage of functional grammar through Short Stories

COURSE OUTCOMES

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall Parts of Speech and relate them with Vocabularies and Sentence Structures	K1
CO2	Explain and illustrate actions based on time and situation.	K2
CO3	Analyze and build a profound knowledge in grammar through communication based on everyday Conversation and Role Plays	K3
CO4	Identify and restate various sentence structures through grammar to develop accuracy and fluency.	K3
CO5	Evaluate and Synthesize statements to enhance LSRW Skills through Short Stories.	K4

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	2	3	3	2	3	2	3	3	3
CO3	3	3	3	3	2	3	2	3	3	3
CO4	3	2	3	3	3	3	3	3	3	3
CO5	2	3	2	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Listening - AOE LAB- Level I- Units -1, 2 & 3</p> <p>Speaking - Self Introduction/ Describe your favourite Person/Food/Place</p> <p>Reading - Short Story - O. Henry-The Last Leaf</p> <p>Writing -Paragraph Writing</p> <p>Grammar- Nouns, Pronouns and Adjectives</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Listening- AOE LAB- Level I- Units- 4, 5 & 6</p> <p>Speaking- Express an Incident of your life where you realized the Importance of Love</p> <p>Reading- Short Story- Rabindranath Tagore - Kabuliwala</p> <p>Writing- Essay Writing</p> <p>Grammar-Verbs-Tenses</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Listening- AOE LAB- Level I- Unit- 7- Level II- Units- 1 & 2</p> <p>Speaking- Ordering food in a restaurant, booking a room, Booking and cancellation of tickets, Enquiring on Availability of Transportation</p> <p>Reading- Short Story-Ernest Hemingway- Cat in the Rain</p> <p>Writing- Writing a Short Story</p> <p>Grammar- Voice and Concord</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Listening- AOE LAB- Level II- Units- 3 & 4</p> <p>Speaking- Express your feelings and emotions if you are lost in a crowd</p> <p>Reading- Short Story- R.K. Narayan-An Astrologer's Day</p> <p>Writing- Letter Writing- Formal</p> <p>Grammar- Adverb and Determiners</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Listening- AOE LAB- Level II- Units- 5, 6 & 7</p> <p>Speaking- Mention about a childhood habit that you wish you would not have possessed</p> <p>Reading- Short Story- Leo Tolstoy- Little Girls are wiser than Men</p> <p>Writing- Letter Writing- Informal</p> <p>Grammar- Preposition, Conjunction and Interjection</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	<p>Self-study for Enrichment</p> <p>(Not Included for End Semester Examination)</p> <p>Listening- Comprehension Passage</p> <p>Speaking- Express your feelings if you have become the Prime Minister of a country, how will you feel if you are the last person to left on earth.</p> <p>Reading- The Adventures of Tom Sawyer-Mark Twain, Treasure Island- Robert Louis Stevenson</p> <p>Writing- Write a poem of 10 lines about your favourite teacher, Write a short note on your favourite festival, describe on your pet at your home, Write a note on step-by-step preparation of coffee.</p> <p>Grammar- Direct and Indirect Speech, Active and Passive Voice</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
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- Tolstoy, Leo. *Little Girls Wiser Than Men*. Tara Books, 2021.

Books For Reference

- Murphy, Raymond. *English Grammar in Use: A Self Study and Practice Book Intermediate Learners Book*. Cambridge University Press, 2013.

Web References

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- <https://www.englishliterature.info/2021/04/kabuliwala-short-story-by-tagore.html>
- [file:///C:/Users/DELL/Downloads/Hemingway%20cat%20in%20the%20rain%20\(1\).pdf](file:///C:/Users/DELL/Downloads/Hemingway%20cat%20in%20the%20rain%20(1).pdf)
- <http://www.collaborativelearning.org/astrologersday.pdf>
- <https://druid675333030.files.wordpress.com/2018/03/little-girls-are-wiser-than-men.pdf>

Pedagogy Assignment, Quiz, and Seminar

Course Designer Ms. A. Esther Rani

Signature of the Course Designer

Signature of the HOD

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UEN1CC1	PROSE	CORE COURSE I	6	6

COURSE OBJECTIVES

- To acquaint students with the styles of the prose writers of the English literary tradition.
- To enable students to differentiate the prose styles of individual authors.
- To enable students to understand and appreciate prose.

COURSE OUTCOMES

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall the modern prose writers of English literary tradition and their works.	K1
CO2	Illustrate the prose styles of individual authors, themes and styles of writing.	K2
CO3	Identify the writer's perspectives from the Elizabethan period till modern period.	K3
CO4	Examine ambiguity and complexity for better understanding of the text.	K4
CO5	Analyze their own interpretations with an awareness and curiosity for other perspectives to gain better prospects.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO 1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	3	2
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	3	3	2	3	2	2	2
CO4	2	3	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	2	3	3	2

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	Cognitive Level
I	Francis Bacon : Of Studies Oliver Goldsmith : The Man in black	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.
II	Richard Steele : The Spectator Club Joseph Addison : Periodical Essay (A great book is a great evil)	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.
III	Charles Lamb : Dream Children: A Reverie William Hazlitt : On Going a Journey	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.
IV	G.K. Chesterton : The Worship of The Wealthy Winston Churchill : Blood, Soil, Tears and Sweat	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.
V	J.B. Priestly : Lectures Robert Lynd : In Praise Of Mistakes	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.
VI	Self-Study For Enrichment (Not to be included for External Examination) Reading topics from Francis Bacon's Essays - Reading and Writing Comprehension passages - Learning values of Great Personality and their works – Reading topics on Charles Lamb Essays of Elia.		CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4.

Text Books

- Kumar, Ashok. *Selected Essays: An Anthology of English Essays for Undergraduates*. Orient Blackswan, 2014.
- M.G Nayar. *A Galaxy of English Essayists*. Macmillan, 1986.
- P.K.Thakar, S. D.Desai, Oxford University Press, 2006.

Reference Book

- Abbott, Edwin A. *Bacon's Essay with Introductions, Notes and Index – (Volume I)*. Penguin Publishers, 2018.

Web References

- <https://www.thoughtco.com/of-studies-by-francis-bacon-1688771>
- <https://gfgc.kar.nic.in/sadalga/GenericDocHandler/263-5df2b3cd-d279-4012-863b-45afb9be338d.pdf>
- <https://www.britannica.com/biography/Joseph-Addison>
- <https://www.litgalaxy2019.com/2020/03/The-Worship-Wealthy-GK-Chesterton.html>

Pedagogy Seminar, Quiz, Assignment and Discussion

Course Designer Ms. M. Irudhaya Pushpam

Signature of the Course Designer

Signature of the HOD

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UEN1CC2	SHORT STORIES	CORE COURSE II	6	6

COURSE OBJECTIVES

- To explore the sequences in understanding a story
- To acquire new vocabulary of words and us age in sentences
- To identify the characters and events of the story

COURSE OUTCOMES

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and relate the stories written from different parts of the world.	K1
CO2	Classify different types of characters and how they react to the situation.	K2
CO3	Apply decisions taken by the characters in the given situation and synchronize in readers' own life.	K3
CO4	Analyze the different themes and its purpose of the making of the plot.	K4
CO5	Examine the story based on themes and analyze the style of writing, and study other aspects of the stories from the global world to enhance job opportunities.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	2	3	3	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	(BRITISH) Saki : The Open Window Somerset Maugham : The Verger	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	(INDIAN) Rabindranath Tagore : Subha R.K. Narayan : A Hero	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	(RUSSIAN) Anton Chekhov : The Bet Leo Tolstoy : The Candle	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	(AMERICAN) Nathaniel Hawthorne : The Snow Image Ray Bradbury : A Sound of Thunder	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	(NEW ZEALAND & FRENCH) Katherine Mansfield : A Cup of Tea Guy De Maupassant : The Diamond Necklace	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study for Enrichment: (Not to be included for End Semester Examination) Implication of reading various classical and modern short stories of various countries across the world – Writing a short story with a theme, plot, content, values and virtues-Express a short story complete an incomplete story creatively- Making a short video of a short story.	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

Text Book

Joseph A. and Balasubramanian. *Memorable Tales*. Pogo Publishing House, 2013.

Books For Reference

Tagore, Rabindranath and Radice, William. *Selected Short Stories*. Penguin books, 1991.

Mansfield, Katherine. *The Doves' Nest and other Stories*. Kessinger Pub Co, 2004.

Bradbury, Ray. *The Golden Apples of the Sun: and other Stories*. Subterranean, 2008.

Brein, Terry O'. *50 Greatest Short Stories*. Rupa Publications, 2015.

Web References

<https://www.vma.is/static/files/enska/Bokmenntir/Short%20Stories/TheOpenWindowSaki.pdf>

https://www.teachingenglish.org.uk/sites/teacheng/files/Maugham_The_Verger_0.pdf

<https://www.englishliterature.info/2021/04/subha-story-by-rabindranath-tagore.html>

https://www.google.com/url?sa=t&source=web&rct=j&url=https://dspss.in/wp-content/uploads/2020/05/Ch-05-English-Golden-Rays-Class-10.pdf&ved=2ahUKEwjUipin5p_3AhUEXTgGHdkBB7c4PBAWegQIBhAB&usg=AOvVaw_1csQdga0_QRTs9qwffXIwMq

<https://www.acschools.org/cms/lib/PA01916405/Centricity/Domain/399/The%20Bet.pdf>

<https://www.edutechtree.com/Eleven%20Stories.pdf>

<https://americanliterature.com/author/nathaniel-hawthorne/short-story/the-snow-image-a-childish-miracle>

https://www.rosaryhs.com/s/1514/images/editor_documents/academics/2017-18/a-sound-of-thunder.pdf?no_cookie=1

<http://nzetc.victoria.ac.nz/tm/scholarly/tei-ManDove-t1-body1-d4.html>

https://fac.ksu.edu.sa/sites/default/files/the_diamond_necklace.pdf

Pedagogy Role Play, Assignment, Discussion, Quiz, Seminar.

Course Designer Dr. J. Jenifer Nancy

Signature of the Course Designer

Signature of the HOD

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS /WEEK	CREDITS
22UEN1AC1	SOCIAL HISTORY OF ENGLAND	FIRST ALLIED-I	4	3

COURSE OBJECTIVES

- To have a comprehensive knowledge of the Social History of England.
- To facilitate better appreciation of literary masterpieces by knowing the social background of England.
- To relate historical movements and its impact on the writers and their literary works.

COURSE OUTCOMES

COURSE OUTCOME AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO NUMBER	COURSE STATEMENT	Cognitive Level
CO-1	Recall and discuss the Renaissance, Reformation that made a great change in the socio-cultural- political-economic and religious revolution in England	K1
CO-2	Relate the facts about the expansion of Colonies and Political parties of England	K2
CO-3	Identify the changes during Queen Anne and the role of Coffee Houses life in London	K3
CO-4	Analyse the reasons for Revolutions, Humanitarian, and the growth of Industries, Science and Technology	K4
CO-5	Examine the background study about the society of England thereby to enhance career opportunities.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	2	3	3	3
CO3	3	3	3	3	2	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

"1"–Slight (Low) Correlation "2"–Moderate (Medium) Correlation

"3"–Substantial (High) Correlation "-" indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	From Darkness to Light Rebirth Brief Historical Background of England The Renaissance The Reformation The Dissolution and the Religion of England	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
II	The Golden Age in English History The Spanish Armada, The Elizabethan Theatre The East India Company The Colonial Expansion	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
III	Radical Changes in English Society The Civil War / The American War of Independence, Puritanism, Political Parties in England Age of Queen Anne and Coffee Houses	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
IV	Various Revolutions The Union of England, Scotland and Ireland The Agrarian Revolution The Industrial Revolution and Other Revolutions	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
V	Victorianism and World Wars Humanitarian Movements The Victorian Age The World Wars and Social Security	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,
VI	Self-Study For Enrichment (Not to be included for End Semester Examination) Political, Social and Economic conditions prevailing in England - The growth of Industries and Communication - Explore the impact of England on Europe	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,

Text Book

Xavier, A. G. *An Introduction to the Social History of England*. Viswanathan Printers, 2007.

Books For Reference

Trevelyan, G.M. *Social History of England*. The English Language Book Society & Longmans, 1962.

William J. Long. *English Literature: Its History and Its Significance for the Life of the English-Speaking World*. Rupa Publications, 2015.

Hudson, W.H. *An Outline History of English Literature*. Maple Press, 2011.

Web References

https://www.uh.edu/~djudkins/life_in_renaissance_england.htm2.

<https://www.history.com/.amp/topics/reformation/reformation>

<https://www.history.com/.amp/topics/british-history/church-of-england>

Pedagogy Quiz, Assignment and Seminar

Course Designer Ms. U. Sree Aruna

Signature of the Course Designer

Signature of the HOD



CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS, TRICHY - 18.
PG DEPARTMENT OF ENGLISH
BA ENGLISH - Programme Structure
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the Candidates admitted from the Academic Year 2022 - 2023 onwards)

II SEMESTER

Semester	Part	Course	Title	Subject Code	Inst. Hrs/ Week	Credits	Exam			Total
							Hours	Marks		
								Int.	Ext	
II	I	Language Course - II (LC) - Tamil*/Other Languages*	Idaikala Ilakiyamum Pudhinamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French - II	22ULF2						
	II	English Language Course - II (ELC)	Functional English for Effective Communication - II	22UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Poetry - I	22UEN2CC3	6	6	3	25	75	100
		Core Course - IV (CC)	Fiction	22UEN2CC4	6	6	3	25	75	100
		First Allied Course - II (AC)	Literary Forms	22UEN2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	23				600

Signature		
Name & Designation	Dr. Jayashree Agarwal HOD	Dr. N. Savithri Dean

Semester II	Internal Marks:25		External Marks:75	
Course Code	Course Title	Category	Hrs / Week	Credits
22UE2	Functional English for Effective Communication- II	English Language Course - II	6	3

Course Objectives:

- To acquire language competency by enhancing LSRW skills
- To acquire vocabularies to frame apposite sentences and to express thoughts affluently
- To understand the different forms of sentences and its transformation thereby creating appropriate contents

Course Outcomes

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall the appropriate usage of phrases and clauses and relate them with different sentence structures.	K1
CO2	Explain and interpret using appropriate vocabulary and Grammar in communication and writing.	K2
CO3	Build knowledge to frame spoken and written expressions for holistic learning.	K3
CO4	Identify and explore the vocabulary and sentence structures in different genres.	K3
CO5	Analyze and synthesize the four skills of language learning to construct creative contents for better prospects.	K4

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Listening - AOE LAB - Level -III- Units – 1, 2 & 3</p> <p>Speaking - Express the memories you cherish / Share your unforgettable experience</p> <p>Reading - Short Story - Oscar Wilde - <i>The Happy Prince</i></p> <p>Writing – E-mails, Blogs and Vlog writing</p> <p>Grammar- Phrases and Clauses</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	<p>Listening - AOE LAB - Level -III - Units- 4, 5 & 6</p> <p>Speaking - Giving Instructions / Taking Appointment</p> <p>Reading - Prose: <i>Stephen Leacock - How to Live to be 200</i></p> <p>Writing – Notice, Writing a Report</p> <p>Grammar- Sentences, Kinds and Types of Sentences</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	<p>Listening - AOE LAB - Level III - Unit- 7- Level IV - Units- 1 & 2</p> <p>Speaking - Mother’s Day poem / the superpower which every mother should have.</p> <p>Reading - One - Act Play: J.B. Priestley - <i>Mother’s Day</i></p> <p>Writing – CV Writing, Cover Letter, Letter of Recommendation, Statement of Purpose (SOP)</p> <p>Grammar- Direct and Indirect Speech</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	<p>Listening - AOE LAB - Level IV- Units- 3 & 4</p> <p>Speaking - Is Freedom of Speech a necessity / State reasons to follow the rules of the society</p> <p>Reading - Fiction: George Orwell - <i>Animal Farm</i> (an abridged version)</p> <p>Writing – Presentation Skills and Tweets</p> <p>Grammar- Question Formation</p>	24	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	<p>Listening - AOE LAB- Level IV - Units- 5, 6 & 7</p> <p>Speaking - A message to your friend or a contemporary issue in the surrounding</p> <p>Reading - Poetry: Shel Silverstein - <i>The Giving Tree</i></p> <p>Writing – Poster Making and Advertising</p> <p>Grammar- Conditionals</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

VI	<p>Self-Study For Enrichment (Not to Be Included for End Semester Examination)</p> <p>Listening – Comprehension Passage</p> <p>Speaking – Speaking about your dream career or your aim and the way you are working for its fulfilment.</p> <p>Reading - Short Story: Amy Tan - <i>Two Kinds</i></p> <p>Writing – Writing a Biography, Dialogue Writing & Screenplay Writing</p> <p>Grammar- Integrated Grammar Practice</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
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* AOE LAB and Speaking will not be Included for Question Paper Settings

* **It's for Internal Assessment Only**

Text Books

Chakraverty, Anima. *Comprehensive Grammar and Composition by Pearson*. 2011.

David, James and Christian, Thomas. *English Today*. IELSC Publications, 2000.

Hamid, Aftab. *Animal Farm – An Abridged Version*. ISBN -13: -979-8672625515, 2020.

Leacock, Stephen. *Literary Lapses*. General Books, 2009.

Markel, Michael H. *Technical Communication*. St. Martin's Press, 2002.

Priestley, J. B. *Mother's Day*. Samuel French Ltd., 2019.

Silverstein, Shel. *Where the Sidewalk Ends*. Harper Collins. 2014.

Wilde, Oscar. *The Happy Prince and Other Stories*. Rupa Publications, 2018.

Reference Books

Murphy, Raymond. *English Grammar in Use: A Self Study and Practice Book Intermediate Learners Book*. Cambridge University Press, 2013.

Bhatnagar R.P. and Bhargava Rajul. *English for Competitive Examinations*. Macmillan. 2002.

Web References

<https://www.grammarbook.com/grammar/clause-phrase.asp>

<https://www.inenglishwithlove.com/blog/improving-sentence-structure>

<https://learnenglish.britishcouncil.org/skills/reading>

https://dictionary.cambridge.org/grammar/british-grammar/reported-speech_2

<https://cpb-us-w2.wpmucdn.com/campuspress.yale.edu/dist/4/2533/files/2018/08/two-kinds-amy-tan-1n17j7y.pdf>

Pedagogy

Vocabulary Enrichment Sheet, Group Discussion, Quiz, Assignment, Adding contents to Student's English Portfolio.

Course Designer Ms. R. Shanthi

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Course Code	Course Title	Category	Hrs / Week	Credits
22UEN2CC3	Poetry - I	Core Course – III	6	6

Course Objectives:

- To enable the students to master Poetry by giving rich background knowledge of the poet's poem and its poetic elements.
- To make the learners be exposed to write creative poetry, think critically and identify the musical elements of the poem and the poetic devices
- To enhance and enrich learners knowledge with social, cultural, moral and humanity values.

Course Outcomes

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of this course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and relate the various elements of poetry, rhyme, meter, tone, and themes by understanding the content and real life situations in society	K1
CO2	Illustrate and interpret the contents of the poem with a social and cultural background	K2
CO3	Explain the values in the poem with a moralistic outlook and thought-provoking touch	K2
CO4	Identify the various poetic devices and structural aspects of the poem	K3
CO5	Analyse and explore the poems and poets from a multi-dimensional paradigm with holistic thinking to create a better self and a better world	K4

Mapping of CO with and PSO and PO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	2	2	2	3
CO3	2	3	3	3	3	2	2	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENTS	HOURS	Cos	COGNITIVE LEVEL
I	Shakespeare - Let me not to the Marriage of True Minds George Herbert - The Pulley	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	John Milton - Lycidas Abraham Cowley - The Wish	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	John Dryden - A Song for St. Cecilia's Day Alexander Pope - Ode on Solitude	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	S.T. Coleridge - Kubla Khan P.B Shelley - Ode to the West Wind	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Alfred Tennyson - Ulysses Dante Gabriel Rossetti - The Blessed Damozel	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study For Enrichment (Not to Be Included for End Semester Examination) Background study of various poets and poems - Romantic poets - Significance of Nature in poetry – Identification of themes – Sonnets of Shakespeare		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

Zama, Margaret *Poetry Down the Ages*, Orient Blackswan, 2006.

Reference Books

Green, David. *The Winged Word*, Macmillan 2006.

Sengupta, Ambika. *Selected College Poems* Orient Blackswan, 2009

Web References

<https://www.poetryfoundation.org/poems/45106/sonnet-116-let-me-not-to-the-marriage-of-true-minds>

<https://poemanalysis.com/george-herbert/the-pulley/>

<https://www.poetryfoundation.org/poems/44733/lycidas>

https://englishverse.com/poems/the_wish

<https://poemanalysis.com/alexander-pope/ode-on-solitude/>

<https://www.poetryfoundation.org/poems/43991/kubla-khan>

<https://poemanalysis.com/dante-gabriel-rossetti/the-blessed-damozel/>

Pedagogy

Quiz, Seminar, Discussion

Course Designer Dr. Cecilia Merlin Wilton

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Course Code	Course Title	Category	Hrs / Week	Credits
22UEN2CC4	Fiction	Core Course IV	6	6

Course Objectives

- To identify the strategies in the novel relating to plot, theme, characters etc.
- To build vocabulary knowledge and create a passion for reading books by enhancing reading skills.
- To analyze the text from social, cultural and moral background and thereby inculcate values.

Course Outcomes

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Recall and relate the story by exploring the novel to know the society and the world.	K1
CO2	Illustrate the characters, themes and plot and examine in real life situations.	K2
CO3	Explain the novel creating an interest to delve deep in narrative techniques of the novel.	K2
CO4	Construct the different strategies of the novel by exploring the myth, culture, values etc. in reality.	K3
CO5	Analyse the novel from various perspectives to develop a holistic thinking for better prospects.	K4

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	2	3	3	2	2	3
CO4	3	3	2	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Daniel Defoe - <i>Robinson Crusoe</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Charles Dickens - <i>A Christmas Carol</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Bama Faustina Soosairaj - <i>Karukku</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Toni Morrison - <i>God Help the Child</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Jonathan Swift - <i>Gulliver's Travels</i>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study For Enrichment (Not To Be Included for End Semester Examination) Robert Louis Stevenson - <i>Treasure Island</i> Subhash Vyam Durgabai Vyam - <i>Bhimayana: Experiences of Untouchability</i>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

Defoe, Daniel. *Robinson Crusoe*, Peacock Books, 2018.

Dickens, Charles. *A Christmas Carol*, Penguin Classics, 2003.

Faustina, Soosairaj Bama. *Karukku*, MacMillian India, 1992.

Morrison, Toni. *God help the Child*, Vintage Publishing, 2016.

Swift, Jonathan. *Gulliver's Travels*, Peacock Books, 2015.

Books for Reference

Roberts, Edgar V. *An Introduction to Reading and Writing*. Fourth Edition. New Jersey: Prentice Hall. 1993.

Sucksmith, Harvey Peter, *The Narrative Art of Charles Dickens*. Great Britain: University Press, Oxford. 1970.

Kumar, Gajendra and Uday Shankar Ojhe. *Indian English Fiction: Readings and Reflections*, Karan Paperbacks, New Delhi: 2019.

Web References

<https://www.gutenberg.org/files/521/521-h/521-h.htm>

<https://www.charlesdickenspage.com/carol-dickens-reading-text.html>

http://ir.unishivaji.ac.in:8080/jspui/bitstream/123456789/1939/10/10_Chapter%203.pdf

<https://www.onlinereadfreebooks.com/en/God-Help-the-Child-A-novel-546882/1>

<https://www.gutenberg.org/files/829/829-h/829-h.htm>

<https://feminisminindia.com/2017/02/20/karukku-bama-book-review/>

Pedagogy Group Discussion, Seminar, Assignments, Quiz and Assignment

Course Designer Ms. T. Haseena Banu

Signature of the Course Designer

Signature of the HOD

Semester - II	Internal Marks:25		External Marks:75	
Course Code	Course Title	Category	Hrs. / Week	Credits
22UEN2AC2	Literary Forms	First Allied Course-II Allied Course (AC)	5	3

Course Objectives

- To introduce students to various genres of literature thoroughly.
- To familiarize works of literature classified by various strategies and forms.
- To provide students a holistic approach to analyze literature in different perspectives.

Course Outcomes

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the skills to analyze the text in terms of their content, purpose and form in language and literature.	K1
CO2	Interpret the texts in terms of social, cultural, theoretical and historical contexts and for research in a multicultural society.	K2
CO3	Classify the texts for a variety of purposes and assess the effectiveness in conveying the meaning for higher learning.	K2
CO4	Identify the elements of Drama and Poetry from a multi-dimensional level for a holistic thinking.	K3
CO5	Determine the variety of Literary Forms in terms of Style, figurative language and Convention in various genres for higher learning and better prospects.	K4

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2	2	3	2	2	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	2	3	2	2	2	3	3	2
CO5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Definition – Nature and Elements of Poetry -Subjective and Objective Poetry–The Lyric – The Ode – The Sonnet –The Elegy– The Idyll- The Epic -The Ballad – The Satire.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
II	The Heroic Couplet- Terza Rima – The Chaucerian Stanza or Rhyme Royal- The Ottava Rima-The Spenserian Stanza.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
III	Dramatic art-Origin of the English Drama-Origin of the English Theatre-Dramatic Types– Tragedy and Comedy – Tragic-Comedy–Farce and Melodrama-The Masque-One-act Play- The Dramatic Monologue.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
IV	Dramatic Irony-Aside-Soliloquy-Expectations and Surprise-Stage Directions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
V	The Essay-The Novel-Short Story – Biography - Autobiography – Literary Criticism – Style	15	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4
VI	Self-Study For Enrichment (Not to Be Included for End Semester Examination) Notes On Shakespeare Shakespearean Comedy- Shakespearean Tragedy- Shakespearean Romance- Shakespeare’s English Historical plays- Shakespeare’s Roman plays.	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4

Text Books

Prasad. B, A Background to the Study of English Literature, Trinity Press Publication, New Delhi, 1999.

Reference Books

W. H. Hudson, *Introduction to the Study of English*. AITBS Publishers, 2009.

Kumar Sathish, *Ages, Movements and Literary Forms*. Agra. Educational Publisher, 2007

Abrams, M.H. *A Glossary of Literary Terms*. Fort Worth: Harcourt Brace Jovanovich College Publishers, 1993.

Web References

<https://examples.yourdictionary.com/different-types-of-drama-in-literature.html>

<https://www.homeofbob.com/literature/genre/poetry/elements.html>

<https://penandthepad.com/dramatic-techniques-literature-8618589.html>

Pedagogy

Group Discussion, Assignments, Quiz

Course Designer

Ms. K. Kanimozhi

Signature of the Course Designer

Signature of the HOD

CAUVERY COLLEGE FOR WOMEN, (AUTONOMOUS)

NATIONALLY ACCREDITED WITH "A" GRADE BY NAAC

ISO 9001:2015 CERTIFIED

TIRUCHIRAPPALLI

PG DEPARTMENT OF ENGLISH



M.A ENGLISH
SYLLABUS
2022-2023 AND ONWARDS

**CAUVERY COLLEGE FOR WOMEN, AUTONOMOUS,
PG DEPARTMENT OF ENGLISH**

VISION

- The Department of English envisions the learners to explore and empower LSRW skills thereby gaining competency in various genres of literature across the world.
- Ensuring the aesthetic sensibility and creativity of the learners for higher pursuits in research and professional career.

MISSION

- Procure academic excellence by mastering language and literature, imbibe human values embedded with personality enrichment.
- To gratify the needs of employability and enshrine learners as socially responsible citizens.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR MA ENGLISH

PO. No	On completion of MA English, the students will be able to
PO1	Exhibit comprehensive knowledge in understanding the issues and problems that arise in the society and apply in life circumstances. (Social Responsibility)
PO2	Achieve in-depth knowledge in various genres of literary texts to contribute the best for the society and to create a better world. (Exploring Success)
PO3	Perceive leadership skills through higher learning and be a visionary to achieve the target. (Professional Competence)
PO4	Identify appropriate resources required for research projects to explore novel ideas to gain real life experience through internships and higher studies. (Discover Innovations)
PO5	Create a scientific attitude and aptitude to undertake research studies for higher learning and career opportunities. (Build Scientific Temperament)

PROGRAMME SPECIFIC OUTCOMES FOR MA ENGLISH

PSO No.	Students of MA English will be able to	POs Addressed
PSO 1	Evaluate literature through politics, environment, society, values, gender and sociological perspectives in reality	PO1
PSO 2	Analyze cognizance to classify the perspectives of English Language and Literature, genres and literary styles of various literatures across the world.	PO1 PO2
PSO 3	Examine writers and their literary works through literary devices and theoretical approaches for professional growth.	PO3
PSO 4	Explore deep insights of literature through hands on experience in research studies enriching critical thinking and creativity.	PO4 PO5
PSO 5	Empower language, linguistics and literature for professional development, crack competitive examinations and to build employability skills.	PO5



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English

M.A Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

I Semester

Semester	Course	Course Title	Course Code	Inst.	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course – I (CC)	British Literature - I (1340 - 1798)	22PEN1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Shakespeare	22PEN1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Indian English Literature	22PEN1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Black Women’s Writing in English Literature	22PEN1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Rhetoric & Stylistics	22PEN1DSE1A	6	3	3	25	75	100
		B. European Fiction in Translation	22PEN1DSE1B						
		C. Technical English	22PEN1DSE1C						
Total				30	23				500

15 Days INTERNSHIP during Semester Holidays

II Semester

II	Core Course– V (CC)	British Literature – II (1799-Present Age)	22PEN2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Translation Theory& Practice	22PEN2CC6	6	5	3	25	75	100
	Core Course – VII(CC)	American Literature	22PEN2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Literary Theory and Criticism	22PEN2CCC1A	6	4	3	25	75	100
		B. Commonwealth Literature	22PEN2CCC1B						
		C. Skill Enhancement	22PEN2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. English Language Teaching	22PEN2DSE2A	6	3	3	25	75	100
		B. Post-Colonial Studies	22PEN2DSE2B						
		C. Branches of Linguistics	22PEN2DSE2C						
	Internship		22PEN2INT		02				
Extra Credit Course	SWAYAM		As per UGC Recommendation						
Total			30	24					600



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English
M.A., Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)

III Semester

III	Core Course– VIII (CC)	Asian Literature in English	22PEN3CC8	6	5	3	25	75	100
	Core Course – IX (CC)	Research Methodology	22PEN3CC9	6	5	3	25	75	100
	Core Course - X (CC)	Cultural Studies	22PEN3CC10	5	5	3	25	75	100
	Core Choice Course- II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		B. Post Modern Fiction	22PEN3CCC2B						
		C. Australian Literature	22PEN3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. English Literature for UGC Examinations	22PEN3DSE3A	5	3	3	25	75	100
		B. Single Author Study – Rabindranath Tagore	22PEN3DSE3B						
		C. Global Literature	22PEN3DSE3C						
	Generic Elective Course -I (GEC)	The Great Indian Epic literature - A Philosophical Approach	22PEN3GEC1	3	2	3	25	75	100
Credit Extra Course	SWAYAM		As per UGC Recommendation						
Total			30	24					600

IV Semester

IV	Core Course– XI (CC)	North East Indian Literature	22PEN4CC11	6	5	3	25	75	100
	Core Course - XII (CC)	Award Winning Authors (Nobel Laureates 1913-2022)	22PEN4CC12A	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. New Literature	22PEN4CCC3A	6	4	3	25	75	100
		B. Climatic Literature	22PEN4CCC3B						
		C. Dalit Literature	22PEN4CCC3C						
	Generic Elective Course - II (GEC)	Campus to Global Connect	22PEN4GEC2	3	2	3	25	75	100
Project		22PEN4PW	9	5				100	
Total			30	21				500	
Grand Total			120	92				2200	



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English

M.A., Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)

Sl. No	Course	No. of Courses	No of Credits	Marks
1	Core Course – (CC)	12	60	1200
2	Core Choice Course – (CCC)	3	12	300
3	Discipline Specific Elective - (DSE)	3	09	300
4	Generic Elective - (GE)	2	04	200
5	Project	1	05	100
6	Internship	1	02	100
Total		22	92	2200

Signature		
Name & Designation	Dr.P.Urmila PG Head	Dr.N.Savithri Dean of Arts

SEMESTER I



Cauvery College for Women (Autonomous), Trichy-18

PG Department of English

M.A Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

I Semester

Sem	Course	Title	Subject Code	Inst. Hrs/ Week	Credits	Exam			Total
						Exam Hrs	Marks		
							Int.	Ext.	
I	Core Course - I(CC)	British Literature - I (1340 -1798)	22PEN1CC1	6	5	3	25	75	100
	Core Course - II(CC)	Shakespeare	22PEN1CC2	6	5	3	25	75	100
	Core Course -III(CC)	Indian English Literature	22PEN1CC3	6	5	3	25	75	100
	Core Course -IV(CC)	Black Women's Writing in English Literature	22PEN1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course – I (DSE)	A. Rhetoric & Stylistics	22PEN1DSE1A	6	3	3	25	75	100
		B. European Fiction in Translation	22PEN1DSE1B						
		C. Technical English	22PEN1DSE1C						
Total				30	23				500

Signature		
Name & Designation	Dr. P.Urmila PG Head	Dr. N. Savithri Dean of Arts

SEMESTER - I	Internal Marks: 25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PEN1CC1	British Literature I (From 1340 to 1798)	Core Course I	6	5

Course Objectives:

- To identify the elements and the key components of British Literature.
- To familiarize the students with the characteristics of various literary genres.
- To understand literature as an expression of human values within a historical and social context.

Prerequisite:

- Thorough knowledge in Social History of England and History of English Literature.

Course Outcomes and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognizant Level
CO1	Analyse the different techniques employed by the prominent authors and explore creativity in the art of writing.	K1,K2, K3,K4
CO2	Examine the concepts of poetry and prose and critically analyze the period from 1340 to1798 through different genres.	K1,K2, K3,K4
CO3	Evaluate the dramas and novels in the British Literature and also diagnose the critical insight of the tragedies.	K1,K2, K3,K4,K5
CO4	Interpret the way the writers tried to create an impact and contributions made through various genres.	K1,K2, K3,K4,K5
CO5	Create and estimate the characters in drama and fiction instilling virtues over vice and to enrich professional growth in higher learning.	K1,K2, K3,K4, K5,K6

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	2	3	3	3	3	3	3	3	2	3

1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Geoffrey Chaucer – The Prologue to Canterbury Tales John Milton – On Shakespeare John Dryden - Why Should a Foolish Marriage Vow Alexander Pope – Ode on Solitude</p> <p>Key concepts: (Sonnet of Milton – Sonnet of Pope – Rise of Dramatic Monologue – Definition and Features of Ode – Features of poetry across the ages)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
II	<p>Francis Bacon - Of Boldness, Of Innovation Richard Steele - Sir Roger's Opinion of True Wisdom</p> <p>Key concepts: (Development of prose – difference between Bacon and Steele works – uniqueness in Samuel Johnson’s prose piece – a study on the periodicals like The Spectator, The Tattler, The Rambler, The Bee etc...)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
III	<p>Richard Cumberland - The Poisoner of Montremos Walter Scott - The Tapestry Chamber</p> <p>Key concepts: (Origin of English short stories)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
IV	<p>Ben Jonson – Every Man in His Humour Richard Brinsley Sheridan – The Rivals</p> <p>Key concepts: (comedy, tragedy, humor, humors comedy, tragic flaw, four humors of Medieval physiology, bodily fluids)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
V	<p>Henry Fielding - Tom Jones Daniel Defoe - Moll Flanders</p> <p>Key concepts: (Elements of the picaresque and the Bildungsroman, comic epic novel)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>Edmund Spenser - Easter William Cowper - Epitaph on a Hare Samuel Pepys - The Diary of Samuel Pepys Walter Scott - Death of the Laird’s Jock Amphora Behan - The Rover Horace Walpole - The Castle of Otranto</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

Text Books:

1. Chaucer, Geoffrey. *The Prologue to the Canterbury Tales*. Oxford, 1997.
2. Bacon, Francis. *The Essays of Francis Bacon*. CreateSpace Independent Pub, 2004.
3. Addison, Joseph and Richard Steele. *The Sir Roger De Coverley Papers from the Spectator*. Kessinger Publishing Co, 2004.
4. Scott, Sir Walter. *The Complete Short Stories of Sir Walter Scott*. Mosaic Books, 2016.
5. Jonson, Ben. *Everyman in his Humour*. Boos Way, 2016.
6. Fielding, Henry. *Tom Jones*. Wordsworth Classic, 1992.
7. Defoe, Daniel. *Moll Flanders*. Bantam Classics, 1989.

References:

1. Pepys, Samuel. *The Diary of Samuel Pepys*. Modern Library, 2003.
2. Scott, Sir Walter. *The Complete Short Stories of Sir Walter Scott*. Mosaic Books.
3. Behn, Aphra. *The Rover*. Book Valley, 2018.
4. Walpole, Horace. *The Castle of Otranto: A Gothic Story*. Oxford, 2014.

Web References:

<https://chaucer.fas.harvard.edu/pages/general-prologue->
<http://www.walterscott.lib.ed.ac.uk/etexts/shortfiction.html>
https://archive.org/stream/sirrogerdecoverl04addi/sirrogerdecoverl04addi_djvu.txt
[https://www.bauerverlag.eu/downloads/Essays-of-Francis-](https://www.bauerverlag.eu/downloads/Essays-of-Francis-Bacon.pdf)
[Bacon.pdfhttps://www.gutenberg.org/ebooks/4200](https://www.gutenberg.org/ebooks/4200)

Pedagogy : Seminar, Discussion and Assignment

Course Designer: Dr. S. Senthilkumari

Signature of the course Designer

Signature of the HOD

Semester I	Internal Marks:25 External Marks:75			
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PEN1CC2	Shakespeare	Core Course II	6	5

Course Objectives

- To create an awareness of Elizabethan Age
- To make the students understand and appreciate the uniqueness and greatness of Shakespeare
- To acquaint the students with the style of Shakespearean works

Prerequisite:

- Basic knowledge of Elizabethan age and Shakespearean works.

Course Outcomes and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate the methods employed by the scholars to understand Shakespearean studies.	K1,K2, K3,K4
CO2	Identify and relate the use of Language in the poetry and dramas pertaining to the Cultural Values.	K1,K2, K3,K4
CO3	Distinguish the style employed by Shakespeare with his Contemporaries.	K1,K2, K3,K4,K5
CO4	Evaluate the works of Shakespeare.	K1,K2, K3,K4,K5
CO5	Estimate the creative skills of Shakespeare to gain competency for better Prospects	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	2	3	3	3	3	2	2
CO3	3	3	3	2	3	3	3	3	2	2
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Sonnet No: 18, 55, 116, 130, 144</p> <p>Key Concepts: Poetic Devices, Volta, Anti-Petrarchan, Psychomachia</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
II	<p>COMEDY: <i>The Merchant of Venice</i></p> <p>Key Concepts: Elements of Comedy</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
III	<p>TRAGEDY: <i>Macbeth</i></p> <p>Key Concepts: Elements of Tragedy</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
IV	<p>CRITICISM ON SHAKESPEARE: G.Wilson Knight – “Brutus and Macbeth” Harold Bloom – “The Merchant of Venice”</p> <p>Key Concepts: Objective correlative, Inartistic Writer</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
V	<p>TALKS ON TEDX: John Bell – “How Shakespeare has made me a Humanist” Shamrock Mcshane – “Seven sides of Shakespeare” Guy Roberts – “To Lead or not to lead: Changing the world with Shakespeare” Doug Scholz Carlson – “Shakespeare, Communication and Connecting to Each Other” Rob Crisell – “How not to Hate Shakespeare”</p> <p>Key Concepts: Humanism, Communication, Globalization, Imagination</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
VI	<p>Self Study for Enrichment (Not to be included for End Semester Examination) Sonnet- 27, 106 <i>The Taming of the Shrew</i> <i>Romeo and Juliet</i> T.S. Eliot – “Hamlet and his Problems” John Bolton – “The power of imagination: Lessons from Shakespeare”</p>	.	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

Text Books:

1. Shakespeare, William. *The Complete Works of Shakespeare*. IBH Publishing Co, 1980.
2. Bloom, Harold. Shakespeare, *The Invention of the Human*. "The Merchant of Venice". Riverhead Books, 1998.
3. Knight, G. *The Wheel of Fire*. "Brutus and Macbeth". Taylor and Francis. 2005.
4. Eliot, T.S. *The Sacred Wood*. "Hamlet and His Problems". Faber & Faber, 1932.

Reference Books:

1. Shaughnessy, Robert. *The Routledge Guide to William Shakespeare*. Routledge, 2011.
2. Bell, Millicent. *Shakespeare's Tragic Scepticism*. Yale University Press, 2002.
3. Viswanathan, S. *Exploring Shakespeare, The Dynamics of Playmaking*, Orient Longman, 2005.
4. Wells, Stanley and Lena Cowen Orlin. *Shakespeare: An Oxford Guide*. OUP, 2003.

Web References

1. <https://youtu.be/kdvn93jny2w>
2. <https://youtu.be/pw3YPeXSsVE>
3. <https://youtu.be/su2L2NWm3kU>
4. <https://youtu.be/RcfMVM7e1pQ>
5. <https://youtu.be/Kh3gMcOUFao>
6. https://www.ted.com/talks/john_bolton_the_power_of_imagination_lessons_from_shakespeare

Pedagogy : Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer: Ms. P.K.Durgadevi

Signature of the course Designer

Signature of the HOD

Semester I	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN1CC3	Indian English Literature	Core Course-III (CC)	6	5

Course Objectives:

- To expose students to the artistic and innovative use of language employed by the writers.
- To instill values and develop human concern in students through exposure to literary texts.
- To provide a learning experience that is traditional and informative.

Pre requisite:

- Good knowledge of various phases of evolution in Indian Writing in English.

Course Outcomes and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Remember and understand the historical trajectory of various genres of Indian Writing in English from colonial times to till the present.	K1,K2, K3,K4
CO2	Analyze Indian literary texts written in English in terms of colonialism, postcolonialism, regionalism, and nationalism.	K1,K2, K3,K4
CO3	Evaluate the reflection of Indian culture in Indian English Literature.	K1,K2, K3,K4,K5
CO4	Apply the ideas encapsulated in Indian Aesthetics to literary texts.	K1,K2, K3,K4,K5
CO5	Create empowerment and awareness to wipe out the social evils to dream of a healthy society through Indian English Literature.	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	UNIT – I POETRY Rabindranath Tagore - Lyric–XXXV(Gitanjali) Sarojini Naidu - The Village Song Nissim Ezekiel - Marriage Jayanta Mahapatra - Dawn at Puri A.K. Ramanujan - Obituary Key Concepts: Anaphora, Metaphor, Apostrophe, Symbolism, Rhyme, Imagery, Personification	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
II	UNIT – II PROSE A.P.J. Abdul Kalam - Turning Point: A Journey through Challenges (Chapter – 3) Salman Rushdie - Imaginary Homelands (Chapter –11.14) Key Concepts: Parallelism, Diction, Foreshadow, Vignette	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
III	UNIT – III SHORT STORIES Jumpa Lahiri - A Temporary Matter Chitra Banerjee Divakaruni - The Ultra Sound R.K. Narayan - Gateman’s Gift Key Concepts: Protagonist, Antagonist, Exposition, Denouement	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
IV	UNIT – IV DRAMA Asif Currimbhoy - The Dumb Dancer Mahesh Dattani - Tara Key Concepts: Atmosphere, Dramatic Tension, Monologue, Three Unities	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
V	UNIT – V FICTION Amitav Ghosh - The Calcutta Chromosome Kiran Desai - The Inheritance of Loss Key Concepts: Cultural Materialism, Deconstruction, Postcolonialism, Feminism	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
VI	SELF STUDY FOR ENRICHMENT (NOT TO BE INCLUDED FOR END SEMESTER EXAMINATION) Kamala Das - My Grandmother’s House Jawaharlal Nehru - Glimpses of World History (Chapter – 22 & 56) Anita Desai - A Devoted Son Girish Karnad - The Fire and the Rain Rohinton Mistry - A Fine Balance	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

Text Books:

1. Tagore, Rabindranath. Gitanjali. BradenBooks,2000.
2. King, Bruce. Three Indian Poets: Nissim Ezekiel, A.K. Ramanujan. Dom Moraes. Oxford UP, 1991.
3. Kalam, A.P.J. Abdul. Turning Points: A Journey through Challenges India. Harper Collins, 2016
4. Rushdie, Salman. Imaginary Homelands. Penguin Book,1991.
5. Lahari, Jhumpa. Interpreter of Maladies. Houghton Mifflin, 2017.
6. Divakaruni, Chitra Banerjee. Arranged Marriage. Penguin, 2017.
7. Narayan.R.K. Malgudi Days. Indian Thought Publications,2000.
8. Currimbhoy, Asif. The Dumb Dancer. WritersWorkshop,1992.
9. Dattani, Mahesh. Tara. Orient Longman,1995.
10. Gosh, Amitav. The Calcutta Chromosome.Penguin,2009

Reference Books:

1. Iyengar, K.R Srinivasa. Indian Writing in English. Sterling Publishing Private Limited,2005.
2. Das, Kamala. Summer in Calcutta. Everett Press,1965.
3. Nehru, Jawaharlal. Glimpses of World History. PenguinBook,2004.
4. Desai, Anita. Games at Twilight and Other Stories. PenguinBook,1983.
5. Karnad, Girish. The Fire and Rain. Oxford University Press,1988.
6. Mistry, Rohinton. A Fine Balance. Faber & Faber,2008.

Web References

1. <https://allpoetry.com/Village-Song>
2. <https://www.poemhunter.com/poem/dawn-at-puri/>
3. https://www.goodreads.com/book/show/5211.A_Fine_Balance
4. <https://www.semanticscholar.org/paper/The-Dumb-Dancer%3A-A-Quest-for-Identity-Kiran/9c30fcde5d87b65264fa8d8fedd56395f1a577f8>

Pedagogy : Seminar, Quiz, Assignment

Course Designer : Dr.P.Helan Jona

Signature of the course Designer

Signature of the HOD

Semester – I	Internal Marks:25		External Marks :75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PEN1CC4	Black Women’s Writing in English Literature	Core Course-IV (CC)	6	5

Course Objectives:

- To develop a greater understanding of the various genres of writings by black women writers from varied cultures.
- To understand how racial and ethnic groups have resisted and struggled to recreate their own cultural identities, leading to both conflict and community empowerment.
- To begin to understand the unique aspects of African American literary theory.
- To gain a fuller and richer understanding of black women’s literature, particularly representations of black women within the American literary and cultural imagination.

Prerequisite

- To have knowledge of Women’s Writing and the issues they portray.

Course Outcomes and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	CognitiveLevel
CO1	Analyse the narrative forms of oral traditions, signifying, folklore, and music, making African American literature unique in its approach.	K1,K2, K3,K4
CO2	Classify the principal works, authors and genres of Black Women’s Writing.	K1,K2, K3,K4
CO3	Evaluate the unique features of Black women’s literature and to recognize characteristics of African American literary history	K1,K2,K3, K4,K5
CO4	Determine the theoretical concepts of race, racism, and racialization in the creation of an ethnic literature.	K1,K2,K3, K4,K5
CO5	Formulate views on ethnic identity and racial identity by individuals and groups in different contexts to gain knowledge and competency for higher prospects	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	2	3	3	3
CO3	3	3	2	3	3	2	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>INTRODUCTION TO AFRICAN AMERICAN WOMEN'S LITERATURE Historical context–Early Black Women writers and Major Themes- The Literature of Slavery, Freedom and its abolition - Harlem Renaissance - Literature of the Civil Rights and Black Power era – Contemporary Black Women writers.</p> <p>POETRY Margaret Walker – Lineage (1942) Audre Lorde - A Woman Speaks (written 1984 /published 1997) Maya Angelou - Caged Bird(1983)</p> <p>Key Concept: Racial oppression - Freedom/Captivity - Happiness/Sorrow- Imagery - Religion Culture – Racism - Slavery – War – Freedom - Equality.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
II	<p>PROSE Margo Jefferson - Scenes from a Life in Negroland (2015) Toni Morrison - The Color Fetish (2017)</p> <p>Key Concepts: Captivity, war and equality</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
III	<p>SHORT STORIES Toni Cade Bambara – Happy Birthday (1972) Alice Moore Dunbar Nelson - The Goodness of St. Rocque (1996)</p> <p>Key concepts: Desperation – Identity - Social and Economic Problems</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
IV	<p>DRAMA Zora Neale Hurston - Color Struck (1926) Pearl Cleage - Blues for an Alabama sky (1995)</p> <p>Key Concepts: Harlem Renaissance - Great Depression - Economic Hardships - Reproductive Rights -Homosexuality</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
V	<p>FICTION Paule Marshall - Praisesong for the Widow (1983) Chimamanda Ngozi Adichie - Half of a Yellow Sun(2006)</p> <p>Key Concepts: Culture, Materialism, loss of identity, Slave trade</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>Barbara Christian's -Black Feminist Criticism Margaret Walker – I Want to Write Bell Hooks - Love as the Practice of Freedom Nafissa Thompson - Heads of the Coloured People Lorraine Hansberry - A Raisin in the Sun Toni Morrison – Tar Baby</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

Text Books:

1. Walker, Margaret. *"Lineage" from This is My Century: New and Collected Poems*. University of Georgia Press, 1989.
2. Lorde, Audre. *"A Woman Speaks" The Collected Poems of Audre Lorde* W. W. Norton and Company Inc., 1997.
3. Angelou, Maya. *Caged Bird, The Complete Collected Poems*. Random House, First Ed., 1994.
4. Jefferson, Margo. *Negroland: A Memoir*. Pantheon Books, 2015.
5. Morrison, Toni. *The Origin of Others*. Harvard University Press, 2017.
6. Bambara, Toni Cade. *Gorilla, My Love*. Random House, 1960.
7. Dunbar, Alice Moore. *The Goodness of St. Rocque, and Other Stories*. Public domain, 1996.
8. Cleage, Pearl. *Blues for an Alabama Sky*. Dramatists Play Service Inc., 1983.
9. Hurston, Zora Neale. *Color Struck*. Rutgers University Press, 1926.
10. Marshall, Paule. *Praisesong for the Widow*. Penguin Books, 1983.
11. Adichie, Chimamanda Ngozi. *Half of a Yellow Sun*. Harper Collins Publishers, 2006.

Reference Books:

1. Carby, Hazel. *Reconstructing Womanhood: The Emergence of the Afro-American Woman Novelist*. Oxford University Press, 1987.
2. Routledge. *Routledge Handbook of African Literature*. first Edited by Moradewun Adejunmobi, Carli Coetzee, 2019.

Web References:

1. <https://www.google.com/MargaretWalker/I+Want+to+Write>
2. <https://www.google.com/AliceMooreDunbarNelsonGorilla+My+Love+Sweet+Town>
3. <https://www.google.com/Lorraine+Hansberry-+A+Raisin+in+the+Sunhttps://scalar.lehigh.edu/toni-morrison/tar-baby-1981-overview-and-links>
4. https://www.researchgate.net/publication/338712372_Routledge_Handbook_of_African_Literature_Edited_by_Moradewun_Adejunmobi_and_Carli_Coetzee_Chapter

Pedagogy : Quiz, Seminar, Assignment

Course Designers : Dr. Prema Joshua & Dr. R. Vanitha

Signature of the course Designers

Signature of the HOD

Semester I	InternalMarks:25		ExternalMarks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PEN1DSE1A	Rhetoric and Stylistics	Discipline Specific Elective Course – I (DSE)	6	3

Course Objective

- To develop conversance of the learners in English Rhetoric and Stylistic.
- To apply the acquired rhetoric skills, linguistics knowledge and Style in analysis of the language.
- Enables the learners to study and to be familiar with future trends in Language.

Prerequisites

- Primary understanding in the art of writing and an interest for listening to discourses combined with an intermediate knowledge about the Contemporary topic in Stylistics in English Language.

Course Outcomes and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the concepts of Stylistics and the Science of Rhetoric.	K1,K2, K3,K4
CO2	Examine the elements of Rhetoric and elaborate the five canons of Rhetoric writing.	K1,K2, K3,K4
CO3	Determine and assess the acquired skills with the levels and theories in Stylistics	K1,K2, K3,K4,K5
CO4	Compare and evaluate contemporary topics in Stylistics	K1,K2, K3,K4, K5
CO5	Construct the contrastive analysis of literature with emerging trends in Stylistics to enhance competency for better prospects and career opportunities.	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	2	3	3
CO2	2	3	3	3	3	2	3	2	3	3
CO3	3	3	3	3	3	2	3	2	3	2
CO4	3	3	3	2	3	2	3	3	3	3
CO5	3	3	3	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>THE SCIENCE OF RHETORIC Definition of Rhetoric – Three Elements of Rhetoric: Presentative, Representative and Elaborative-Rhetorical Situation: Grammar, Logic, Aesthetics, and Ethics – 5 Canons of rhetoric writing.</p> <p>Key Concepts: Logic, Aesthetics, Inventive, Arrangement, Style, Memory, Delivery.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
II	<p>DISCOURSE Topic Sentence, Paragraph Unity: Coherence and flow, Methods of Developing Paragraphs, Discourse. Four Kinds of Discourse: Exposition, Argumentation, Description, Narration.</p> <p>Key Concepts: Comparison, Concession, Emphasis, Parallelism</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
III	<p>STYLISTICS The Linguistic Levels of foregrounding in Stylistics, Stylistics speech acts and impoliteness theory, Stylistics point of view and modality, Speech and thought presentation in stylistics.</p> <p>Key Concepts: Formalist Stylistics, Metaphor and Metonymy, Rhetoric and Poetics, Schema, Script, and Frame Theory</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
IV	<p>CONTEMPORARY TOPICS IN STYLISTICS Pedagogical Stylistics, Feminist Stylistics, Critical Stylistics.</p> <p>Key Concepts: Feminist Stylistics, Point of View and Modality, Speech and Thought Presentation, Text World Theory.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
V	<p>EMERGING TRENDS IN STYLISTICS Creative Writing and Stylistics, Stylistics and Film, Stylistics and hypertext Fiction. Practical Work: Creative Writing.</p> <p>Key Concepts: Cognitive Poetics, Drama and Performance, Rhetoric and Poetics, Narratology, Stylistics and Film.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>Art of Discourse. Discourse Analysis; Elements of Grammar and Transformation of Sentences. Metaphor and Stylistics. Stylistics and Translation. Stylistics, Emotion and Neuroscience.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4 K5, K6

Text Books:

1. Weston, Anthony. *A Rulebook for Arguments*. Hackett publication, 2009.
2. Cleanth Brooks and Robert Penn Warren. *Modern Rhetoric*. Harcourt Brace Jovanovich, 1979.
3. Paul Simpson. *Stylistics: A Resource Book for Students*. Routledge, 2nd edition, 2014.
4. Edited by Michael Burke. *The Routledge Handbook of Stylistics*. Routledge, 2014.

Reference Books:

1. Robin Wooffitt. *Conversation Analysis and Discourse Analysis: A Comparative and Critical Introduction*, First Edition. SAGE, Publications Ltd, 2005.
2. Widdowson H.G., *Discourse Analysis*. Oxford University Press, 2012.

WebReferences

1. <https://rulb.org/en/article/ritorika-lingvistika-i-stilistika-obzor/>
2. <https://www.degruyter.com/document/doi/10.1515/9781614511335-014/html>
3. <https://www.thoughtco.com/stylistics-language-studies-1692000>
4. <https://oxfordre.com/literature/view/10.1093/acrefore/9780190201098.001.0001/acrefore9780190201098-e-1008>

Pedagogy : PPT, Assignment, Phonetic Transcription, Quiz and Assignment.

Course Designer : Ms.AViolet Pangaja Bai

Signature of the Course Designer

Signature of the HOD

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22PEN1DSE1B	European Fiction in Translation	Discipline Specific Elective Course- I (DSE)	6	3

Course Objectives:

- To reveal the complex scope and the wealth and values hidden in European literature
- To expose the richness of European culture to the students
- To introduce various cultural practices followed in European Nations

Prerequisite:

- Acquire knowledge of western civilization and European cultures.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Analyse and classify the concepts of European culture through various genres of literature	K1,K2, K3,K4
CO2	Examine the themes and forms in various fictions, poems, dramas and novels.	K1,K2, K3,K4
CO3	Evaluate the style of the European writers and their works.	K1,K2,K3, K4,K5
CO4	Compare the characters and motifs in the European literature	K1,K2,K3, K4,K5
CO5	Create to build the ideas with various European cultures, traditions and languages for progression and better prospects.	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Milan Kundera - The Unbearable Lightness of Being Albert Camus - The Stranger Key Words: Physical unfaithfulness, shunning, emotional faithfulness, irrationality of human actions and philosophical notion of absurdity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	Orhan Pamuk - Snow Nikos Kazantzakis - Zorba the Greek Key Words: Universality of death, modernity verses religion, incredible friendship and the importance of living life to the fullest.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	Boris Pasternak - Doctor Zhivago Mikhail Sholokhov - And Quiet Flows the Don Key Words: Stability, communist regime, peace, acceptance, analogy, guilt, responsibility and blame.	18	CO1, CO2, CO3, CO4,	K1, K2 K3, K4, K5, K6
IV	Camilo Jose Sela -The Family of Pascual Duante Jose Saramago -The Year of the Death of Ricardo Reis Key Words: Spanish Civil War, alienation, cultural contextualization and conflict.	18	CO1, CO2, CO3, CO4,	K1, K2 K3, K4, K5, K6
V	Umberto Eco - The Name of the Rose Elias Canetti - Auto-da-Fe Key Words: Judgement, hypocrisy, dissociated intellectualism, evil, chaos and destruction.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Antoine de Saint -Exupéry - The Little Prince Ahmet Hamdi Tanpınar - A Mind at Peace Gunter Grass - The Tin Drum Isabel Allende - City of the Beasts Michael Ende - The Neverending Story	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books :

1. Kundera, Milan. *The Unbearable Lightness of Being*. Faber & Faber, 2000.
2. Camus, Albert. *The Stranger*. Vintage, 1989.
3. Pamuk, Orhan. *Snow*. Vintage, 2005.
4. Kazantzakis, Nikos. *Zorba the Greek*. Faber & Faber, 1959.
5. Pasternak Boris. *Doctor Zhivago*. Pantheon, 1997.
6. Sholokhov, Mikhail. *And Quiet Flows the Don*. Penguin Press, 2017.
7. Sela, Camilo Jose. *The Family of Pascual Duarte*. BrightSummaries.com, 2018.
8. Saramago, Jose. *The Year of the Death of Ricardo Reis*. Vintage Digital, 2013.
9. Eco, Umberto. *The Name of the Rose*. Mariner Books, 2014.
10. Canetti, Elias. *Auto-da-Fe*. Farrar, Straus and Giroux, 1984

Reference Books

1. Bell, James Scott. *Write Great Fiction Plot & Structure: Techniques and Exercises for Crafting and Plot That Grips Readers from Start to Finish*. Writer's Digest Books, 2004.
2. Forster E. M. *Aspects of Novel*. Rosetta Books, 2010.

Web References:

1. https://www.msjkeeler.com/uploads/1/4/0/6/1406968/milan_kundera_-_the_unbearable_lightness_of_being.pdf
2. <https://www.sfps.org/site/handlers/filedownload.ashx?moduleinstanceid=27607&dataid=78367&FileName=The%20Stranger%20-%20Albert%20Camus.pdf>
3. <https://archive.org/details/snow00pamu/page/n15/mode/2up>
4. https://archive.org/stream/NikosKazantzakisZorbaTheGreek/Nikos-Kazantzakis-Zorba-the-Greek_djvu.txt
5. https://archive.org/stream/DoctorZhivago_201511/Doctor%20Zhivago_djvu.txt
6. <https://www.supersummary.com/the-tin-drum/summary/>
7. <https://www.supersummary.com/the-family-of-pascual-duarte/summary/>
8. <https://www.themodernnovel.org/europe/w-europe/portugal/saramago/reis/>
9. <https://www.docdroid.net/wIUWCoa/umberto-eco-the-name-of-the-rose-1980-pdf#page=5>
10. <https://archive.org/details/in.ernet.dli.2015.65735/page/n11/mode/2up>

Pedagogy: Role Play, Assignment, Discussion, Quiz, Seminar.

Course Designer: Dr. J. Jenifer Nancy

Signature of the course Designer

Signature of the HOD

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/ Week	Credits
22PEN1DSE1C	Technical English	Discipline Specific Elective Course- I (DSE)	6	3

Course Objectives

- Given a technical paragraph identify the topic sentence, infer meanings, lexical and contextual items, and find the supporting points and transitional tags.
- Given a communication context specify the barriers to listening and deduce solutions to overcome the barriers.
- Given short conversations and monologues for listening, specify appropriate responses and construct a summary. For a given topic, introduce ideas, give opinions and justify your stance.

Prerequisite:

- Consent of the Instructor

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Inspect the topic sentence, infer meanings, lexical and contextual items, and find the supporting points and transitional tags	K1,K2, K3,K4
CO2	Analyse the given context and specify the barriers to listening and deduce solutions to overcome the barriers	K1,K2, K3,K4
CO3	Interpret the given technical graphical representation and compose passage.	K1,K2, K3,K4,K5
CO4	Determine and Plan to prepare a 15-minute presentation using visual aids and deliver a power point presentation for a given technical topic.	K1,K2, K3, K4,K5
CO5	Construct an argumentative, descriptive, biographical or autobiographical passage	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	2	2	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	READING Predicting the Content - Skimming the Text - Understanding the Gist - Topic Sentence and its Role Scanning Inferring Meanings: Lexical and Contextual - Note-Making.	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
II	WRITING Forms - Descriptive Writing -Autobiographical & Biographical Writing - Paragraph Writing - Academic Writing-Tweets - Paraphrasing- Channel Convention Essay Writing: Argumentative Writing-Poster Making- Recommendations-Dialogue Writing- Informal Letters	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
III	LISTENING Importance of Listening & Empathy in Communication - Reasons for Poor , Listening - Traits of a Good Listener - Listening Mode - Note Taking - Listening to Short Dialogues - Listening to Long Conversations.	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
IV	SPEAKING Describing Places- Giving Opinions - Narration - Introducing Ideas – Justifying Opinions - Formal Conversations - Telephonic Skill - Debating - Apologizing - Extempore - Effective Presentation Strategies-Planning - Outlining & Structuring - Nuances of Delivery - Controlling Nervousness	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
V	Nuances of Delivery - Stage Fright -Visual Aids in Presentation- Applications of MS Power Point	18	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6
VI	Self- Study for Enrichment (Not to be included for End Semester Examination) Interpreting Graphics in Technical Writing Sequencing of Sentences Reading comprehension Dictionary Skills.	-	CO1, CO2, CO3, CO4, CO5	K1,K2 K3,K4, K5, K6

TEXT BOOK

1. Dr.K.Elango, "Resonance", Cambridge University Press, New Delhi, 2013.
2. Dr.APJ Abdul Kalam "India 2020 Vision for the Millennium Brooks/Cole Publishing Company, 2002.

REFERENCE BOOKS

1. Meenakshi Raman, Sangeeta Sharma, "Technical Communication Engineers". Oxford University Press, New Delhi, 2012
2. Nagaraj Geatha "A Course in Grammar and Composition". Cambridge University Press,2012
3. Samson T. "Innovate with English", Cambridge University Press, 2012
4. Mark Ibbotson, "Cambridge English for Engineering". Cambridge University Press, 2012.
5. B. Sai Lakshmi, "Poly Skills A Course in Communication and Life Skills". Cambridge University Press, 2012.

WEB REFERENCE

<https://www.udemy.com>

<https://www.pearson.com>

Pedagogy : Role Play, Assignment, Discussion, Quiz, Seminar.

Course Designer :Dr. P.Urmila & Dr. Rita Shanthakumar

Signature of the course Designers

Signature of the HOD

SEMESTER II



Cauvery College for Women (Autonomous), Trichy - 18.

MA- Programme Structure

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022 -2023 onwards)

II SEMESTER

Semester	Course	Title	Course Code	Inst.Hrs /Week	Credits	Exam			Total
						Exam Hrs	Marks		
							Int.	Ext.	
II	Core Course – V (CC)	British Literature – II (1799- Present Age)	22PEN2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Translation Theory & Practice	22PEN2CC6	6	5	3	25	75	100
	Core Course – VII (CC)	American Literature	22PEN2CC7	6	5	3	25	75	100
	Core Choice Course-I (CCC)	A. Literary Theory and Criticism	22PEN2CCC1A	6	4	3	25	75	100
		B. Commonwealth Literature	22PEN2CCC1B						
		C. Skill Enhancement	22PEN2CCC1C						
	Discipline Specific Elective Course – II (DSE)	A. English Language Teaching	22PEN2DSE2A	6	3	3	25	75	100
		B. Post-Colonial Studies	22PEN2DSE2B						
		C. Branches of Linguistics	22PEN2DSE2C						
	INTERNSHIP		22PEN2INT		2				100
Total			30	24				600	

Signature		
Name& Designation	Dr. P.Urmila PG Head	Dr. N. Savithri Dean

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2CC5	British Literature – II (1799-Present Age)	Core Course-V (CC)	6	5

Course Objectives:

- To provide students with the critical faculties necessary in an academic environment, on the job, and in an increasingly complex, interdependent world.
- To enable the students to critically analyse research in criticism of literary and cultural texts from different historical periods and genres.
- To assist students in the development of intellectual flexibility, creativity, and cultural literacy so that they may engage in life-long learning.

Pre requisite:

- Basic knowledge in Social History of England and History of English Literature with an additional knowledge of British Literature I

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Compare and appreciate the traditional and modern works of literature through society.	K1,K2, K3,K4
CO2	Examine the style, theme, tone, image and symbolism used in works across.	K1,K2, K3,K4
CO3	Defend the influence of socio-historical factors and the representation of their age in the texts.	K1,K2, K3,K4,K5
CO4	Appraise the depth and diversity of British Literature before and after the World Wars	K1,K2, K3,K4,K5
CO5	Construct comparisons with various Literary Movements to deconstruct texts with greater clarity for higher learning.	K1,K2, K3, K4,K5,K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	2	3	3	3	2
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	2	3	3	3	3	2	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>POETRY: Alfred Tennyson – The Charge of the Light Brigade W.B. Yeats – Leda and the Swan Dylan Thomas – A Letter to my Aunty Warsan Shire – Home</p> <p>Key Concepts: Romanticism – erotism - Abbey Theatre – Symbolism – Surrealism - Modernism</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6
II	<p>PROSE: Thomas Babington Macaulay – Minute on Education Virginia Woolf – On a Faithful Friend</p> <p>Key Concepts: Whiggism – Historicism – Stream of Consciousness – war - shell shock</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6
III	<p>SHORT STORY: James Joyce– A Mother (Dubliners)Kate Atkinson– Inner Balance</p> <p>Key Concepts: Avant-grade movement – interior monologue– wordplay</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6
IV	<p>DRAMA: P.B. Shelley – Prometheus Unbound G.B. Shaw – Arms and the Man</p> <p>Key Concepts: poetic drama – atheism – Vegetarianism – eugenics – alphabet reform</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6
V	<p>NOVEL: George Elliot – The Mill on the Floss Julian Barns – The Sense of an Ending</p> <p>Key Concepts: realism - psychological insight</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>D.H. Lawrence - The Rainbow Sarah Waters – The Paying Guests</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3,K4, K5, K6

Text Books:

1. Sen, S. W. B. Yeats: *Selected Poems*. Unique Publication, 2020.
2. Macaulay, Barbington Thomas. *Speeches by Lord Macaulay, With His Minute on Indian Education*. Arms Pr Inc, 1935.
3. Woolf, Virginia. *The Collected Essays of Virginia Woolf*. Ingram Short Title, 2011.
4. James, Joyce. *Dubliners*. Classy Publishing, 2011.
5. Atkinson, Kate. *Not the End of the World*. Back Bay Books, 2004.
6. Shelley, Percy Bussy. *Prometheus Unbound*. Book Jungle. 2007.
7. Shaw, George Bernard. *Arms and the Man*. Peacock Books, 2020.
8. Eliot, George. *The Mill on the Floss*. Maple Press, 2014.
9. Barnes, Julian. *The Sense of an Ending*. RHUK, 2012.

Reference Books:

1. Jeffares, Alexander Norman. *A Commentary on the Collected Poems of W.B. Yeats*. Stanford University Press, 1968.
2. Lawrence, D, H. *The Rainbow*. Peacock, 2021.
3. Waters, Sarah. *The Paying Guests*. Virago Press, 2014.

Web References

<https://www.doe.mass.edu/mcas/pdf/2012/250799.pdf>
<https://www.poemhunter.com/poem/a-letter-to-my-aunt/>
<https://www.amnesty.ie/wp-content/uploads/2016/06/home-by-warsan-shire.pdf>
https://barcelonareview.com/32/e_ka.htm
<https://www.ipl.org/essay/A-Short-Story-A-Mother-Of-James-F382WJU74SJP6>
<https://etc.usf.edu/lit2go/79/just-so-stories/1301/how-the-camel-got-his-hump/>

Pedagogy : Seminar, Assignment, role play and group discussion.

Course Designer : Dr. S. Senthilkumari

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2CC6	Translation Theory & Practice	Core Course- VI (CC)	6	5

Course Objectives:

- To understand theories of translation of various translators across the globe.
- To reinforce translation as an academic discipline of knowing various genres in different language.
- Master the technical art of applying linguistic knowledge with subject in qualitative standard.

Pre requisite:

- Gain vast knowledge of various class and literature of different cultures, valid texts in the wide world.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze translation with a profound knowledge of knowing various literature across the globe and its difficulties	K1,K2, K3,K4
CO2	Compare and evaluate the theories and its applicability in various genres.	K1,K2, K3,K4,K5
CO3	Determine the importance of Bible translation classics and texts to possess a wide knowledge of global literature.	K1,K2, K3,K4, K5
CO4	Formulate texts based on Thirukural poems, Prose, Drama by bilingual mode of interpretation through practice and research.	K1,K2, K3,K4, K5,K6
CO5	Creatively imagine to translate passages with equivalent words for higher learning and better prospects	K1,K2, K3,K4, K5,K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	2	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	2	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Definition of Translation (Nida, Roman Jakobson, Susan Bassnet, Catford) – Types of Translation – Translation process – Principles-Equivalence.</p> <p>Key Concepts: Source Language, Target Language, Encoding, Decoding, Intra Lingual, Inter Lingual, Inter Semiotics.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>Brief History of Translation – Bible Translation – Period Study – Theorists (Chapman, Wyatt, Surrey, Abraham Cowley, John Dryden, Alexander Pope, Goethe, Schlegel, H.W. Longfellow, Fitzgerald, Hilarie Belloc)</p> <p>Key Concepts: Period Study, Transition of Bible, Renaissance, Post Modernism</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Expressive, Informative & Vocative- Inter-linear, Intra-linear and Inter-semiotic, Formal and Dynamic Equivalence.</p> <p>Key Concepts: Levels and Strategies of various theorists, Problems of equivalence, Cognitive insight into the Process of Translation</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Linguistic, Paradigmatic, Syntagmatic and Stylistic Equivalence Transference, Transliteration and Transcreation Kinds of Untranslatability- Linguistic and Cultural factors - Translating literary text, Prose, Poetry, and Drama</p> <p>Key Concepts: Problems of Translators, Problems of Translation in the global world</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>A Home in the Sky -Vaasanthi The Song of Kuyil - Dr. T.N.Ramachandran</p> <p>Translation Practice</p> <p>அச்சமில்லை – பாரதியாரின் கவிதைகள் செவ்வாழை – அறிஞர் அண்ணா</p> <p>News Paper Reports</p> <p>Key Concepts : Biography, Human Values- Love, Compassion, Passage Translation, Character Sketch, Themes, Patriotic Songs of Bharathiyar.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>Thirukkural – Possession of Decorum Translation practice in poem, various chapters in Thirukural and Paragraph Translation.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Bassnet, Sussan. *Translation Studies*. London: Routledge, 1991.
2. Bassnet, Sussan & Harish Trivedi. *Post-Colonial Translation – Theory and Practice*. London: Routledge, 1999.
3. Newmark, P. *Approaches to Translation*. Oxford. Pergaman Press, 1982.
4. Nida, E. *The Theory and Practice of Translation*. Leiden: E.J. Brill, 1969
5. Ramachandran. T.N. *Four Long Poems of Mahakavi Bharathi. Tanjavur: Sain Sekkizar School of Saiva Siddanta, 2009*

Reference Books:

1. Collins. *Cobuild Dictionary*. New Delhi: Orient Black swan, 2014.
2. Steiner, G. *After Babel: Aspects of Language and Translation*. Oxford: University Press, 1978

Web References

<https://www.exoticindiaart.com/book/details/four-long-poems-of-mahakavi-bharati-tamil-text-translation-in-english-notes-and-index-naw494/>
<https://dheivegam.com/achamillai-achamillai-bharathiyar-kavithai/>
https://www.valaitamil.com/sevvazhai_1591.html
<https://www.google.com/search?q=thirukural+translation&ei=RJYRY9-zHLuNseMPu72I0A0&ved=0ahUKEwjf5ZjZsfX5AhW7RmwGHbseAtoQ4dUDCA4&uact=5&oq=thirukural+translation>

Pedagogy: Seminar, Assignment,

Course Designer: Ms. A. Edel Flora Mary

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs /Week	Credits
22PEN2CC7	American Literature	Core Course -VII (CC)	6	5

Course Objectives:

- To have an awareness on social, cultural and political issues in American Literature.
- To analyze literary works within the contexts of different literary periods.
- Understanding of the contribution of different texts and authors to American literary tradition.

Pre requisite:

- An understanding of History of American writers of and their writings.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Examine to comprehend and analyze historical movements in dramatic literature, life and dreams of America as reflected in the literary works for higher learning and social outlook	K1,K2, K3,K4
CO2	Determine the issues, conflicts and themes of the various genres in contemporary poems of society and the world	K1,K2, K3,K4;K5
CO3	Evaluate and explore how literary drama reflects and shapes the perceptions of critical social issues.	K1,K2, K3,K4, K5
CO4	Construct the elements of literature such as themes, motifs, style and tone, for critical thinking.	K1,K2, K3, K4, K5,K6
CO5	Formulate critical research problems in the literary text and also analyze, evaluate and synthesis them to interpret and gain knowledge for higher learning and better prospects.	K1,K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	2	2	3	3	3	2	3
CO3	3	3	3	3	2	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>POETRY Edgar Allan Poe - The Raven Emily Dickinson - I Died for Beauty - but was Scarce Maya Angelou - Phenomenal Women</p> <p>Key Concepts: Imaginary, Journey, Fable, Spiritual reality, antecedent, bizarre, grotesque, contradiction, recurring, wench, protrude, phenomenal, stunning</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>PROSE Ralph Waldo Emerson -The American Scholar. Edgar Allan Poe - The Philosophy of Composition</p> <p>Key Concepts: Embark, endeavors, trope, intuition, oppressed, bourgeois, civilization</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>SHORT STORIES William Faulkner - The Rose for Emily Nathaniel Hawthorne - The Birth Mark.</p> <p>Key Concepts: Femininity, oppression, racial, tyranny, violation, controversial, proletarian, religious, communist, implication, mortality, blemish, concoctions,</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>DRAMA David Mamet - A Life in the Theatre. Tennessee Williams - A Street Car Named Desire</p> <p>Key Concepts: Industrialization, technological, identity, expressionism, realism, unrestrained, promiscuity, racism</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>FICTION Alice Walker - The Color Purple Paul Beatty - The Sellout</p> <p>Key Concepts: Conservative, organized, antithesis, insanity, disintegration, alienated, fictitious, satirical, racial, identity, isolated</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for external examination.)</p> <p>Ann Bradstreet - To my Dear and Loving husband Maya Angelou - A Plagued Journey Thoreau - Civil Disobedience Edward Albee -Who is Afraid of Virginia Wolf.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. The New Anthology of American Poetry Vol1. Edited by Steven Gould Axelrod, Camille Roman, Thomas Travisano, Rutgers University Press,2012.
2. The New Anthology of American Prose Edited by Steven Gould Axelrod, Camille Roman, Thomas Travisano 2000.
3. A Street Car Named Desire, Tennessee Williams, Penguin UK 2009 1 Edition.
4. Home, Springer, link.springer.com

Reference Books:

1. Kenneth Sacks: Understanding Emerson: The *American Scholar* and his struggle for self-Reliance Princeton, New Jersey: Princeton University Press, 2003.Second.
2. Oliver, Egbert S. American Literature.1890-1965 An Anthology.1994.
3. William, J Fisher, etall, 19th Century: An Anthology. Eurasia Publ.House. Pvt.Ltd., New Delhi. 1984.

Web References

1. <https://en.wikipedia.org/wiki/AmericanLiteraturehttps://americanliterature.com>
2. www.poetryfoundation.org/.
3. <https://www.britannica.com/topic/A-Life-in-the-Theatre>

Pedagogy : Group Discussion, Seminars, Quiz and Assignments.

Course Designer : Ms. Irudhaya Pushpam .M

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25	External Marks:75		
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2CCC1A	Literary Theory and Criticism	Core Choice Course – I (CCC)	6	4

Course Objectives:

- To identify the difference and the advancement from criticism to present
- To evaluate the concept of *Base* and *Superstructure* determined by Marxist
- To appreciate various literary texts in the light of literary theories

Pre requisite:

- Critical knowledge of Literary Criticism and its history

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyse the overall outline to literary criticism from various perspectives.	K1,K2, K3,K4
CO2	Evaluate the importance of literary theories with the text to create holistic thinking.	K1,K2, K3,K4;K5
CO3	Determine literary criticism with literary characters and works for professional growth.	K1,K2, K3,K4, K5
CO4	Formulate the core points in literary theories for critical thinking and creativity.	K1,K2, K3, K4, K5,K6
CO5	Discuss literary theory with literary themes to gain knowledge for higher learning and professional development.	K1,K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	3	3	2	3	2	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>New Criticism: Wimsatt & Beardsley – “The Intentional Fallacy”</p> <p>Marxism Louis Althusser – Infrastructure and Superstructure, The State Ideological Apparatuses (<i>Ideology and Ideological State Apparatuses</i>)</p> <p>Key Concepts :Close reading, autotelic, base, superstructure</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	<p>Structuralism: Ferdinand de Saussure – Nature of the Linguistic Sign (<i>Course in General Linguistics</i>, Part one, pg no. 65 - 70)</p> <p>Post Structuralism: Roland Barthes – “The Death of the Author”</p> <p>Key Concepts: Sign, Binary Oppositions, Birth of reader</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	<p>Psychoanalytical Criticism Geoffrey Gorer – “The Myth in Jane Austen”</p> <p>Reader Response Criticism: Stanley Fish – “Is there a Text in this Class?”</p> <p>Key Concepts: Unconscious, Interpretive Communities</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	<p>Gender Studies Helen Cixous – “The Laugh of the Medusa”</p> <p>Ecocriticism William Rueckert – “Literature and Ecology: An Experiment in Ecocriticism”</p> <p>Key Concepts : Radical Feminism, Phallogentric, Ecology</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	<p>Post-Colonial Studies Chinua Achebe – “An Image of Africa: Racism in Conrad’s <i>Heart of Darkness</i>”</p> <p>Postmodernism Michel Foucault – Seeing and Knowing</p> <p>Key Concepts: Racism, Identity, Meta narratives</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	<p>Self -Study for Enrichment (Not to be included for external examination.)</p> <p>Elements and Traits of New Criticism, Marxism, Structuralism, Post Structuralism, Psychoanalytical Criticism, Reader Response Criticism, Gender Studies, Ecocriticism, Post-Colonial Studies, Postmodernism.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Saussure, Ferdinand De. *Course in General Linguistics*. The Philosophical Library, Inc., 1959.
2. Richter, David H. *Falling into Theory*. Bedford/St. Martin's, 1999.
3. Scott, Wilbur. *Five Approaches of Literary Criticism*. Macmillan, 1963.
4. Foucault, Michel. *The Birth of the Clinic*. Taylor & Francis, 2003.

Reference Books:

1. Barry, Peter. *Beginning Theory. An Introduction to Literary and Cultural Theory*. Manchester University Press, 2009.
2. Culler, Jonathan. *Literary Theory*. OUP, 2011.
3. Leitch, Vincent B. *The Norton Anthology of Theory and Criticism*. OUP, 2001.

Web References

1. https://www.sas.upenn.edu/~cavitch/pdf-library/WimsattBeardsley_Intentional.pdf
<http://www.csun.edu/~snk1966/Lous%20Althusser%20Ideology%20and%20Ideological%20State%20Apparatuses.pdf>
2. [Barthes-The-Death-of-the-Author.pdf \(tufts.edu\)](#)[The Laugh of the Medusa \(csudh.edu\)](#)
3. <https://static1.squarespace.com/static/5441df7ee4b02f59465d2869/t/58f2e526bf629a9dbf74f778/1492313394594/RUECKERT++Literature+and+Ecology.pdf>
<http://ponderosaenglishkessler.weebly.com/uploads/9/5/1/5/9515361/achebe-chinua.pdf>
<http://thowe.pbworks.com/f/lyotard.defining.postmodern.PDF>

Pedagogy : Seminar, Group discussion and Assignment,

Course Designer : Ms. P.K. Durgadevi

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2CCC1B	Commonwealth Literature	Core Choice Course-I (CCC)	6	4

Course Objectives:

- To introduce learners to literary theory from the beginning of the twentieth century till now
- To help learners apply theory in the analysis of literary texts present day
- To enable learners to understand a wide range of theoretical perspectives to enhance their appreciation of literary texts

Pre requisite:

- Thorough knowledge in literary theories and its application to the text.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Examine the literary premises of intellectual and social background pertinent to important eras of the literary and critical theory	K1,K2, K3,K4
CO2	Determine the terms used in the criticism of literature for holistic thinking.	K1,K2, K3,K4;K5
CO3	Evaluate to Historicize and contextualize foundational theoretical and critical texts for professional growth.	K1,K2, K3,K4, K5
CO4	Formulate possible applications of critical theory to various literary texts to train them as professionals	K1,K2, K3, K4, K5,K6
CO5	Imagine students to discover their own interests in literary and critical theories creatively for higher learning and better prospects.	K1,K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	2
CO2	3	2	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	2	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>POETRY</p> <p>E. J. Pratt - The Dying Eagle Mariam Waddington - The Drug Addict Charles Harper - An Aboriginal Mother's Lament Kenneth Slessor - Gulliver A. D. Hope - Australia</p> <p>Key concepts: Literariness and Paraphrasing is heresy, Free play, equality</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	<p>PROSE</p> <p>Margaret Atwood - Nature as a Monster from Chapter 2 of Survival: A Thematic Guide to Canadian Literature C.D Narasimhaiah - Commonwealth Literature : Heirloom of Multiple Heritage</p> <p>Key concepts: Literature and Environment, Gender Oppression, race</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	<p>SHORT STORIES</p> <p>Rabindranath Tagore - Post Master Ken Saro Wiwa - Divorcee</p> <p>Key concepts: Base and Superstructure, Orient, Negritude, Dasein, Anxiety, Despair.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	<p>DRAMA</p> <p>Wole Soyinka - A Dance of the Forests Manjula Padmanabhan - The Harvest</p> <p>Key concepts: Gynocritics, Feminine, Feminist, Literature and Environment</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	<p>FICTION</p> <p>Michael Ondaatje - The English Patient J.M. Coetzee - Disgrace</p> <p>Key concepts: Disillusionment, Break from Tradition, Self Referentiality, Objective Truth</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	<p>Self -Study for Enrichment (Not to be included for external examination.)</p> <p>New Criticism- Formalism- Structuralism- Deconstruction - Modernism – Postmodernism- New Historicism - Cultural Materialism- Feminism- Ecocriticism – Existentialism- Marxism- Post colonialism. These theories can be applied to the works given above.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Narasimhaiah, C.D. *Commonwealth Literature: History and Criticism*, Anurag Jain, 1995.
2. Soyinka, Wole. *A Dance of the Forest*, Surjeet Publications, 2018.
3. Padmanaban, Manjula. *Harvest*, Aurora Metro Books, 2003.
4. Ondaatje, Michael. *The English Patient*, Vintage, 1993.
5. Koetzee, J.M. *Disgrace*, Vintage, 2000.

Reference Books:

1. Maity, Joydev. *Commonwealth Literature: A Comprehensive and Critical Perspective*, Notion Press, 2020.

Web References

1. <https://www.scribd.com/document/443622445/The-Dying-Eagle>
2. https://canlit.ca/canlit_authors/miriam-waddington-2/
3. <https://www.australianculture.org/an-aboriginal-mothers-lament-charles-harpur-1853/>
4. <https://allpoetry.com/poem/8521575-Gulliver-by-Kenneth-Slessor>
5. <https://sahyadriliterature.blogspot.com/2018/08/poem-analysis-of-australia-by-a.html>
6. <https://nmi.org/wp-content/uploads/PublicDomain/ThePostmaster.pdf>
7. <https://warwick.ac.uk/fac/arts/english/currentstudents/postgraduate/masters/modules/resourcefiction/oil09/wiwamonthday.pdf>

Pedagogy : Lecture, Assignment , Seminar

Course Designer : Ms. G. Vijayarenganayaki

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25	External Marks:75		
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2CCC1C	Skill Enhancement	Core Choice Course – I (CCC)	6	4

Course Objectives:

- Learn what a group is and how individuals interact in a group
- Know why interviews are held and what they are looking for
- Have a good understanding of what your own priorities are in a job
- Appreciate the importance of etiquette for a good living.
- Examine how work attitudes relate to job performance.

Pre requisite:

- To make the students able and efficient communicators by helping them to be self-reflexive about English, goal oriented and be fine-tuned for career opportunities.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the text, and respond to basic comprehension questions for better critical thinking to face the challenges of the world.	K1, K2, K3, K4
CO2	Examine English grammar skills to enhance grammatical components in written and verbal communication to achieve their goal.	K1, K2, K3, K4
CO3	Interpret an idea in series logically connected sentences by describing an event such as objects, people, places, processes for conducting activities like group discussion, presentation, reporting and documentation in changing situations for growth and progression.	K1, K2, K3, K4, K5
CO4	Construct to comprehend the given passage and able to answer the linked questions for professionalism, higher learning and research.	K1, K2, K3, K4, K5.
CO5	Create interest to write creatively to enhance professionalism for holistic thinking for higher learning and better prospects.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	2	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	2	3	2	2	2
CO4	2	2	3	3	3	3	2	3	3	3
CO5	2	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Group Discussion Leadership and problem-solving skills Critical Thinking Collaborative Skills Key Concepts: Group Dynamics, Team Building, Develops Leadership Quality.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	Purpose of Interview Before and after the Interview Do's and Don'ts in an interview Time Management Stress Management Key Concepts: Interview Techniques, Body Language.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	Preparing a Resume Writing a cover Letter Framing Questions Key Concepts: Placement Training, Writing Bio-data.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	Personality Development Presentation Skills Public Speaking Key Concepts: Creative Thinking, Debates	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	Workplace Etiquette Values and Ethics Culture Gender equality Key Concepts: Develops Human Values, Workplace Ethics, Equality of Status.	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	Self-Study for Enrichment (Not to be included for external examination.) Writing for the Digital Media Travel Writing Mock Interview Attitude Development	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. How to Succeed at Interviews Paperback – 1 January 2008 by Yeung, Dr. Rob (Author)
2. Cracking the Code to a Successful Interview Pellett, Evan .2016.

Reference Books:

1. Co, Lina Mukhopadhyay &. *Poly skills: A course in communication skills and life skills*. Chennai: Foundation, 2012. print.
2. Seema Gupta. Corrected Manners and Etiquette, www.vspublishers.com

Web References

www.udemy.com
<https://www.coursera.com/>
www.edx.org
www.udacity.com

Pedagogy: Quiz, Assignment, Seminar

Course Designer : Ms.U.Sree Aruna

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs /Week	Credits
22PEN2DSE2A	English Language Teaching	Discipline Specific Elective Course – II (DSE)	6	3

Course Objectives:

- To know the insights of ELT in LSRW skills and Grammar
- To be aware of the old and modern methods and approaches in ELT
- To effectively choose and apply the appropriate method in a classroom during ELT

Pre requisite:

- To attain knowledge of English and focus on the holistic development.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the concepts of language between the theories of second language acquisition in life situations.	K1, K2, K3, K4
CO2	Determine a positive attitude towards language learning through different methods across the world.	K1, K2, K3, K4, K5
CO3	Assess the language learning strategies effectively through aptitude, objective and descriptive types of test for professional growth.	K1, K2, K3, K4, K5
CO4	Formulate the ability to consider the students' needs, language development levels, ages, intelligence types and learning styles for critical thinking and research.	K1, K2, K3, K4, K5, K6
CO5	Construct to create English Language Learning with Technologies and create an awareness of social and environmental issues for higher learning.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	2	2	3
CO2	3	3	3	2	2	3	3	3	2	3
CO3	2	3	3	3	3	2	3	3	2	3
CO4	2	2	2	3	3	2	2	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>History of ELT in India/ Status and Importance of English Language Principles, Aims and Objectives of Teaching English Introduction to Second Language Acquisition theories (Chomsky, Stephen Krashen, Vygotsky) Place of English in Curriculum & Grammar in ELT</p> <p>Key Concepts: Theories of Language- Growth of English Language</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	<p>Methods of Teaching Need Analysis, Understanding the learning, learner. Problems Involved in ELT (Motivation and Attitude towards learning English) Communicative Method, Natural Approach, Total Physical Response, Suggestopedia.</p> <p>Key Concepts: Types of Learning- Activity based Learning.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	<p>Designing a Syllabus & Curriculum Role of materials in ELT Criteria for selection of Teaching Materials, Assumptions underlying materials in ELT Criteria for selection of tasks, activities. ICT Tools, Teaching Aids</p> <p>Key Concepts: Avoid Grammatical Errors, Motivational Approach and Communicational Approach.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	<p>Teaching of different skills (LSRW) Teaching of Pronunciation, Grammar, Vocabulary, Integrated skills, study skills</p> <p>Key Concepts: Task Based Approach, Lexical Approach, Eclectic Method.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	<p>Evaluation & Assessment Nature and Scope of Evaluation, Types of Tests and its Characteristics. Different aspects of teaching various components of Language. Technology in ELT.</p> <p>Key Concepts: Creative Teaching Methodologies – Online Teaching and Learning</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for external examination.)</p> <p>ICT Methodologies Applied Linguistics – History of English Education. Oral Approach and Situational Approach</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books:

1. Rogers & Richards. *Approaches, Methods and Techniques*. Cambridge, 2014.
2. Krishnaswamy, N and Lalitha Krishnaswamy. *Methods of Teaching English*.
3. Nagaraj, Geetha. *English Language Teaching*. New Delhi: Orient Black Swan, 2008.
4. Peter, Francis. *A Glossary of ELT Terms and Key Concepts*. *English Language Teaching*. Chennai. Shrine Print Solution, 2012. Print
5. Wood.T. Frederick, *An Outline History of The English Language*. (2nd edition). Chennai: Macmillan India Limited, 1969.Print.

Reference Books:

1. Cook.V. *Second Language Learning and Language Teaching*, Oxford University Press,2008.
2. Ellis,R. *Understanding SLA*, Oxford University Press,1986.
3. Littlewood, W.*CLT: An Introduction*, Cambridge University Press 1981.
4. Prabhu, N.S.*SL Pedagogy*, Oxford University Press,1987
5. Aggarwal, J.C. *Principles, Methods and Techniques of Teaching*. New Delhi: Vikas PublishingHouse, 2009.
6. David Crystals. *Linguistics* (pages 239-243, 9-36) I.F. Wall work. *Language and Linguistics*, London: Longman House, 1995. Print.
7. Mark Arff and Janie Rees – Miller ed. *The Handbook of Linguistics*, USA: Blackwell Publishers, 2001.
8. Thornbury Scott, *An A-Z of ELT: A Dictionary of Terms and Concepts*. Underhill Adrian (Ed.) Macmillan Books for Teachers, 2006, Print.

Web References

https://edu.google.com/intl/ALL_in/workspace-for-education/classroom/
<https://www.sli.do/>
<https://padlet.com/>
<https://kahoot.com/>

Pedagogy: Seminar, Assignment

Course Designer: Ms. Diana Betty Garrett

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs /Week	Credits
22PEN2DSE2B	Post-Colonial Studies	Discipline Specific Elective Course – II (DSE)	6	3

Course Objectives:

- To re-assess colonial histories and Post-colonial Literatures in all their complexity and diversity.
- To promote awareness regarding post-colonial issues.
- To present a positive attitude towards complexity and diversity of post-colonial literature.

Pre requisite:

- To have an awareness of various cultures and studies of post in Colonial Literature.

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze and relate the concepts of post-colonial literature in social cultural background.	K1,K2, K3,K4
CO2	Determine a positive attitude towards complexity and diversity of post-colonial literature to create a better literary world.	K1, K2, K3, K4,K5
CO3	Assess the various themes and motif of post-colonial literature for a professional outlook.	K1, K2, K3, K4, K5
CO4	Compare the various themes, characters, style and technique in post-colonial literature for research and higher learning.	K1, K2, K3,K4, K5,K6
CO5	Discuss the various issues focused in post-colonial literature for holistic thinking.	K1, K2,K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	2	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	2	3	2	3	3	3
CO5	2	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation
“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>INTRODUCTION Post-colonial Terms, Theories and Post-Colonial Studies.</p> <p>Key Concepts: Ambivalence, Hybridity, Hegemony</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>POETRY David Diop – Africa Rabindranath Tagore – Chain of Pearls Andrew Lang – Nightingale Weather Emily Davis – A Song of Winter</p> <p>Key Concepts: Diaspora, Ideology, Features of Poetic Devices</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>PROSE Bill Ashcroft, Gareth Griffiths & Helen Tiffin – The Empire Writes Back (Post-coloniality and Theory) Edward Said – Orientalism (Introduction)</p> <p>Key Concepts: Social Inequality, Integration, National Identity</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>DRAMA Wole Soyinka – The Swamp Dwellers Ayi Kwei Armah – The Beautiful Ones are Not Yet Born</p> <p>Key Concepts: Salvation, Aboriginal Culture, Individuality</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>FICTION Richard Van Camp – The Lesser Blessed Jean Rhys – Wide Sargasso Sea</p> <p>Key Concepts: Alienation, Allegiance, Hybridity</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination)</p> <p>Homi Bhabha - Nation and Narration Frantz Fanon – Black Skin, White Mask Chinua Achebe – Things Fall Apart https://www.google.com/search?q=oxford+union+speech+by+shashi+tharoor&oq=oxford+union+spee&aqs=chrome..69i57j0i22j30l7.6881j0j7&sourceid=chrome&ie=UTF-8</p>	--	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Ashcroft. *Key concepts in Post-Colonial Studies*, Routledge Publishers 1998.
2. Donnell Margaret Joan *Anthology of Commonwealth Verse*, Blackie & Son (January 1, 1963)
3. Walsh William. *Readings in Commonwealth Literature*, Oxford University Press 1973.

Reference Books:

1. Pramod K Nayar. *Post-Colonial Literature: An Introduction*, Pearson Education India 2008.
2. Childs Peter. *Post-Colonial Theory and English Literature: A Reader*, Edinburgh University Press 1999.

Web References

<https://literariness.org/2016/04/06/postcolonialism/>
<https://poemotopia.com/david-diop/africa/>
<https://www.quora.com/What-are-the-major-themes-of-Wide-Sargasso-Sea-by-Jean-Rhys.>
<http://www.postcolonialweb.org/poldiscourse/spivak/spivak2.html>
<https://www.gradesaver.com/the-lesser-blessed>
https://www.google.com/url?sa=t&source=web&rct=j&url=https://www.spokesmanbooks.com/Spokesman/PDF/68roy.pdf&ved=2ahUKEwim5o_mlcV6AhUWTmwGHWiKCK4QFnoECDsQAQ&usg=AOvVaw2eHgNo_Nj2N38izpLs0i5z
https://www.academia.edu/26063928/The_Empire_Writes_Back_Theory_and_Practice_in_Post-Colonial_Literatures_by_Bill_Ashcroft_et_al

Pedagogy : Quiz, Assignment, Seminar

Course Designer : Ms.L.Samyuktha

Signature of the Course Designer

Signature of the HOD

Semester II	Internal Marks:25		External Marks:75	
Subject Code	Course Title	Category	Hrs / Week	Credits
22PEN2DSE2C	Branches of Linguistics	Discipline Specific Elective Course – II (DSE)	6	3

Course Objectives:

- To understand the structure and branches of linguistics
- To provide an insight towards the composition of language in a methodical manner.
- To gain focus on Linguistics and its development

Pre requisite:

- Basic knowledge on the sound, meaning, syntax, structure, and development of language

Course Outcome and Cognitive Level Mapping

On the completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Analyze the roots and history of language thereby increasing the study of the spoken medium and of the processes of language interaction.	K1, K2, K3, K4
CO2	Examine the recent developments in language evolution over many generations connecting it with the variation and change from multiple perspectives.	K1, K2, K3, K4
CO3	Assess and derive insights of language changes noticed in the contemporary world and to assist in language research.	K1, K2, K3, K4, K5
CO4	Develop language function and cognitive systems, the relationship between language and society, the new ways of examining how the brain responds to language.	K1, K2, K3, K4, K5, K6
CO5	Estimate the language of individuals as acquired knowledge that is the product of their encounter with external social, co-operative endeavor.	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation “2” - Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no Correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>What is Linguistics? - A short history of linguistics- The Interaction of linguistics with other disciplines</p> <p>Key Concepts: Human Language, General characteristics of Language, Languages through time</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>Sociolinguistics- Inter- Speaker Variation & Intra- Speaker Variation- Multilingual Communities - Socio Pragmatics – Indian Stylistics</p> <p>Key Concepts: Methodology, Ethnography, variables, Sampling the speech Community, Gender, Race, Ethnicity, Age, Social Class, Social Networks and Communities of practice.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Psycholinguistics- The first wave- The Second and Third Wave</p> <p>Key Concepts: Cognitive revolution, Experimental psycholinguistics, the rise of the machines</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Neurolinguistics- Cortical Organization- Spoken word forms</p> <p>Key Concepts: Brain mapping methods, speech perception, speech production, Printed word forms & Sentences</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Cognitive linguistics- Philosophical stance - Constructions</p> <p>Key Concepts: Rejection of modularity and the autonomy of language, Rejection of the autonomy of syntax hypothesis, Motivation, acquisition, Background cognition</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study For Enrichment (Not to be included for End Semester Examination)</p> <p>Evolutionary Linguistics- Evolutionary Semantics and Pragmatics- Evolutionary phonetics, morpho syntax and phonology</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Allan, Keith, Editor. *The Routledge Handbook of Linguistics*. Routledge, 2016.
2. Thakur, Vijay Singh. *Stylistics of Indian English Fiction*. ISBN- 10- 8183871763, Jan 1 2008.

Reference Books:

1. Malmkjaer, Kirsten, Editor. *The Routledge Linguistics Encyclopedia*. Third edition, Routledge, 2010.

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<https://www.careers360.com/articles/branches-of-inguistics-counar>
<https://blog.cambridgecoaching.com/what-is-linguistics-intro-to-branches-of-linguistics>
<https://linguistics.ucsc.edu/about/what-is-linguistics.html>
<https://all-about-linguistics.group.shef.ac.uk/branches-of-linguistics/>

Pedagogy: Chalk and Talk, PPT, Quiz, Group Discussion, Seminar, Assignment

Course Designer: R. Shanthi

Signature of the Course Designer

Signature of the HOD



Cauvery College for Women (Autonomous)

Nationally Accredited (III cycle) with 'A' Grade by NAAC

ISO 9001:2015 Certified

Annamalai Nagar, Trichy-18

P.G & Research Department of Social Work

VII Board of Studies	
Minutes of the Meeting	
Date	: 29/10/2022
Time	: 10.30 AM

The Members attended the meeting

- Dr.G.Mettilda Buvanewari
Associate Professor & Head
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy. - Chairman
- Dr.R.Mangaleswaran
Professor & Head,
Department of Social Work
Bharathidasan University
Trichy - University Representative
- Dr.F.X.Lovelina Little Flower
Professor & Head
Department of Social Work
Bharathiyar University
Coimbatore - Subject Expert
Bharathiar University
- Lennart Sauer,Lektor Ph.d
Associate Professor
Deputy Head of Department
Department of Social work
Samhallsvetarhuset
Umea University - International Academic
Expert
- Dr.J.S.Gunavathi
Associate Professor
Department of Social Work
Madras School of Social Work
Chennai. - Special Expert
(other University)
- Mr.S.Joseph Raj
Deputy General Manager -HR
ONGC,Neravy,
Karaikkal
Trichy. - Representative
from corporate / Industry sector
- Ms.Tresa Sugirtha
Assistant Professor
Department of Social Work
PSG College of Arts and Science
Coimbatore - One Postgraduate Meritorious Alumnus
- Dr.G.Kanaga
Professor & Dean of Alumnae Relations
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member
- Dr.S.Vidhya
Assistant Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member
- Ms.PL.Rani
Assistant Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member
- Dr.O.Aisha Manju
Assistant Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member
- Ms.S.Hema
Assistant Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member
- Dr.T.Amirtha Mary
Assistant Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy - Member

Agenda of the Meeting

ITEM NO.BOS/07/01

To consider and approve the Programme structure of VI Semester and II semester syllabus of BSW for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women (Autonomous), Trichy-18.

ITEM NO.BOS/07/02

To consider and approve the Programme Structure of IV Semester and II Semester syllabus of MSW for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women(Autonomous),Trichy-18.

ITEM NO.BOS/07/03

To Ratify the I Semester Exam Pattern of UGC-Jeevan Kaushal-Universal Human Values for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women (Autonomous),Trichy-18.

ITEM NO.BOS/07/04

To Ratify the I Semester Syllabus of MSW and change the course Elective as Discipline Specific Elective for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women(Autonomous),Trichy-18.

ITEM NO.BOS/07/05

To thank the members of BOS

At the outset, the members discussed the above Agenda and is Resolved as Follows

Dr.G.Mettilda Buvanewari, Associate Professor & Head, PG & Research Department of Social Work Welcomed the Members of BOS

RESOLUTION ITEM NO.BOS/07/01

Considered and Approved the Programme Structure of Six Semesters and II Semester syllabus of BSW for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18 with the following changes

RESOLUTION ITEM NO.BOS/07/02

Considered and Approved the Programme Structure of four Semesters and II Semester syllabus of MSW for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18 with the following changes

RESOLUTION ITEM NO.BOS/07/03

Considered and Ratified the I Semester Exam Pattern of UGC-Jeevan Kaushal-Universal Human Values for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women(Autonomous),Trichy-18.

RESOLUTION ITEM NO.BOS/07/04

Considered and Ratified the I Semester Syllabus of MSW and change the course Elective as Discipline Specific Elective for 2022-2023 batch onwards and recommend to the academic council, Cauvery college for Women(Autonomous),Trichy-18.

RESOLUTION ITEM NO.BOS/07/05

The Chairman Dr.G.Mettilda Buvanewari thanked the Members

Signature

Dr.G.Mettilda Buvanewari
Chairman & Associate Professor
PG & Research Department of Social Work
Cauvery College For Women (Autonomous)
Trichy-18

S.No	Name and Designation	Signature
1	Dr.G.Mettilda Buvanewari Chairman & Associate Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i>
2	Dr.R.Mangaleswaran Professor & Head, Department of Social Work Bharathidasan University Trichy	
3	Dr.F.X.Lovelina Little Flower Subject Expert Professor & Head Department of Social Work Bharathiyar University Coimbatore	
4	Lennart Sauer,Lektor Ph.d Associate Professor Deputy Head of Department Department of Social work Samhallsvetarhuset Umea University	
5	Dr.J.S.Gunavathi Associate Professor Department of Social Work Madras School of Social Work, Chennai.	
6	Mr.S.Joseph Raj Deputy General Manager -HR ONGC,Neravy, Karaikkal Trichy.	<i>[Signature]</i>

7	Ms. Tresa Sugirtha Assistant Professor Department of Social Work PSG College of Arts and Science Coimbatore	<i>[Signature]</i> 29/10/2022
8	Dr.G.Kanaga Member Professor & Dean of Alumnae Relations PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022
9	Dr.S.Vidhya Member Assistant Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022
10	Ms.PL.Rani Member Assistant Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022
11	Dr.O.Aisha Manju Member Assistant Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022
12	Ms.S.Hema Member Assistant Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022
13	Dr.T.Amirtha Mary Member Assistant Professor PG & Research Department of Social Work Cauvery College For Women (Autonomous) Trichy-18	<i>[Signature]</i> 29/10/2022

[Signature]
HEAD & ASSOCIATE
PROFESSOR, DEPT. OF SOCIAL WORK

N. SANKAR
DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
THIRUCHIRAPPALLI - 620 018
TAMILNADU

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with "A" Grade by NAAC

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PG & RESEARCH DEPARTMENT OF SOCIAL WORK



SYLLABUS

BACHELOR OF SOCIAL WORK

2022-2023 and onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF SOCIAL WORK

VISION

The vision of our department is to advance the personal, social, intellectual and personality of the students through social work education so as to achieve higher positions in serving the society across local and global community systems.

MISSION

- To orient the students acquire knowledge, skills and values of Social Work and develop an attitude of commitment towards social work profession.
- To train the students in the fields of Social Work by enabling the practice and application of theory through field work trainings.
- To inculcate values by means of conducting programmes through various associations attached to the department.
- To mentor the students through tutor-ward system in the department.
- To extend wider exposure to students in the field of Social Work through organizing National & International seminars, workshops, symposium etc and enable them to establish contacts with academicians, field experts, high profile personalities in different fields.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR BSW PROGRAMME

PO NO.	PROGRAMME OUTCOMES On completion of BSW Programme, the students will be able to
PO1	Possess thorough knowledge of language and understand the concerns of the society in real situations and work environment. (Academic Excellence with Social Thinking)
PO2	Express thoughts and ideas effectively using appropriate texts, media and evaluate practices, policies and theories by applying scientific and social approaches. (Skilled Proficiency)
PO3	Acquire training skills in research, internships and foster team spirit in the global world and face the challenges in a multicultural society. (Team Building and Problem Solving)
PO4	Relate and apply exemplary role models/writers and their values to elucidate different kinds of unknown problems. (Leadership Traits & Critical Thinking)
PO5	Inculcate lifelong learning by fostering scientific attitude aimed at personal and societal development to meet the changing demands of work and career through knowledge and skills. (Situational Approach and Lifelong Learning)

PSO NO.	PROGRAMME SPECIFIC OUTCOMES On completion of BSW Programme, the students will be able to	POs Addressed
PSO1	Demonstrate a comprehensive understanding of Social Work profession and understand the issues and problems that arise in the society.	PO1
PSO2	Identify challenges in Health sectors, family and child settings, industries, rehabilitation centres, Correctional settings, etc. and use scientific approach in handling them.	PO2, PO5
PSO3	Collaborate and coordinate with philanthropists, groups and organisations by applying professional social work skills, values and ethics through team work for the advantage of vulnerable sections of the Society	PO3, PO4
PSO4	Discover methods, techniques, models/approaches to deal with the emerging issues, problems and challenges through critical thinking.	PO4
PSO5	Adapt to the changing situations by utilizing life skills and the desire for life long learning in their career and in day to life to achieve personal and professional goals.	PO3, PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
PG & RESEARCH DEPARTMENT OF SOCIAL WORK
BACHELOR OF SOCIAL WORK
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semest	Part	Course	Course Title	Course Code	Inst. Hrs.	Credits	Exam			Total	
							Hrs	Marks			
								Int	Ext		
I	I	Language Course-I (LC)	Ikkala Ellaikkiyam	22ULT1	6	3	3	25	75	100	
			Hindi Literature & Grammar-I	22ULH1							
			History of Popular Tales, Literature and Sanskrit Story	22ULS1							
			Basic French-I	22ULF1							
	II	English Language Course-I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100	
	III	Core Course – I(CC)	Introduction to Social Work	22USW1CC1	6	6	3	25	75	100	
			Core Course- II (CC)	Structure of Indian Society and Indian Social Problems	22USW1CC2	6	6	3	25	75	100
			First Allied Course- I (AC)	Basics of Economics and Political System	22USW1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100	
	Total					30	23				600
II	I	Language Course-II (LC)	Edaikala Ellakiyamum Puthinamum	22ULT2	5	3	3	25	75	100	
			Hindi Literature & Grammar-II	22ULH2							
			Poetry, Textual Grammar and Alankara	22ULS2							
			Basic French-II	22ULF2							
	II	English Language Course- II(ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100	
	III	Core Course – III (CC)	Methods of Social Work	22USW2CC3	6	6	3	25	75	100	
			Core Practicum- I (CP)	Field Work Practicum (P)	22USW2CC1P	6	6	3	40	60	100
			First Allied Course – II (AC)	Communication for Social Workers	22USW2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
	Extra Credit Course			SWAYAM	As per UGC Recommendation						
Total					30	23				600	

III	I	Language Course-III (LC)	Kappiyam Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar-III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French – III	22ULF3						
	II	English Language Course-III(ELC)	Learning Grammar through Literature– I	22UE3	6	3	3	25	75	100
	III	Core Course– IV(CC)	Human Growth and Development	22USW3CC4	5	5	3	25	75	100
		Core Practicum - II(CP)	Field work Practicum (P)	22USW3CC2P	6	6	3	40	60	100
		Second Allied Course-I (AC)	Social Legislations	22USW3AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-III(AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Generic Elective Course- I (GEC)	Human Rights	22USW3GEC1	2	2	3	25	75	100
Basic Tamil-I			22ULC3BT1							
Special Tamil-I			22ULC3ST1							
Extra Credit Course		SWAYAM	As per UGC Recommendation							
Total				30	23				700	

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	Pandaya Ellakiyamum	22ULT4	6	3	3	25	75	100
			Urainadayum	22ULH2						
			Hindi Literature & Functional Hindi	22ULS4						
			Drama, History of Drama Literature	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Introduction to Social Work Research	22USW4CC5	5	5	3	25	75	100
		Core Course – VI(CC)	Social Welfare Administration	22USW4CC6	5	5	3	25	75	100
		Second Allied Course- II (AC)	Health Care Services	22USW4AC4	4	3	3	25	75	100
	IV	Internship	Internship	22USW4INT	-	2	-	-	100	100
		Generic Elective Course- II (GEC)	Women Rights and Laws	22USW4GEC2	2	2	3	25	75	100
Basic Tamil -II			22ULC4BT2							
Special Tamil-II			22ULC4ST2							
Skill Enhancement Course – I (SEC)	Life Skills (P)	22USW4SEC1P	2	2	3	40	60	100		
Extra Credit Course	SWAYAM	As per UGC Recommendation								
Total				30	25				800	

V	III	Core Course – VII(CC)	Family and Child Welfare	22USW5CC7	6	6	3	25	75	100
		Core Course –VIII(CC)	Community Development	22USW5CC8	5	5	3	25	75	100
		Core Course -IX(CC)	Introduction to Counselling and Guidance	22USW5CC9	5	5	3	25	75	100
		Core Practicum –III(CP)	Field Work Practicum (P)	22USW5CC3P	5	5	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Disaster Management	22USW5DSE1A	5	4	3	25	75	100
	B. Welfare of Vulnerable		22USW5DSE1B							
	C. Human Rights and Social Work		22USW5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Social Entrepreneurship (P)	22USW5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
Total					30	29				700
VI	III	Core Course X	Theories of Social Work	22USW6CC10	6	6	3	25	75	100
		Core course XI	Welfare of the Persons with disability	22USW6CC11	5	5	3	25	75	100
		Core course XII	Correctional Social Work	22USW6CC12	3	3	3	25	75	100
		Core course XIII	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. Gerontological Social Work	22USW6DSE2A	5	4	3	25	75	100
			B. Youth Welfare	22USW6DSE2B						
			C. Fundamentals of Statistics	22USW6DSE2C						
	Project	Project Work	22USW6PW	5	3	-	-	100	100	
	V	Ability Enhancement Compulsory Course-V(AECC)	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total					30	27				700
Grand Total					180	150				4100

Semester I	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22USW1CC1	INTRODUCTION TO SOCIAL WORK	CORE	6	6

Course Objectives

1. To introduce to the learners the basic philosophy of Social Work.
2. To enable the learners to understand the concepts of Social Work such as Social Service, Social Welfare, Social Reform, Social Justice, Social Security, Social Policy, Social Defence, Social Development, Human Rights and Social Legislation.
3. To kindle the learners to develop the desire explore the origin of Social Work in India and abroad.
4. To support the learners to learn the contribution of various religions towards society's welfare.
5. To help the learners to discover the scope and fields of practice of Social Work.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define, Recall, explain, demonstrate and outline, Meaning, Definition, Basic Assumptions, Objectives, Philosophy, Ethics and Principles of social work, Functions and Methods, the basic concepts of Social Work, history, religious values and contribution, scope and fields of Social Work.	K1, K2
CO2	Identify and apply Methods, concepts, history, religious values and contribution, scope and fields of Social Work.	K3
CO3	Analyse, categorize, compare, list, Distinguish and examine Methods, concepts, history, religious values and contribution, scope and fields of Social Work.	K4
CO4	Explain Methods, concepts, history, religious values and contribution, scope and fields of Social Work.	K5
CO5	Elaborate and Discuss Methods, concepts, history, religious values and contribution, scope and fields of Social Work.	K6

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	2	1	1	1
CO2	3	3	3	3	3	2	3	1	1	2
CO3	3	2	3	3	2	3	3	3	1	3
CO4	1	1	1	1	1	3	2	2	1	1
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Social Work: Meaning, Definition, Basic Assumptions, Objectives, Philosophy, Ethics and Principles of social work, Functions and Methods	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Basic concepts of Social Work: Social Service, Social Welfare, Social Reform, Social Justice, Social Security, Social Policy, Social Defence, Social Development, Human Rights, Social Legislation.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Historical development of Social Work: Development of Professional Social Work- USA, UK,& India, Development of Social Work education; Professional aspects of Social Work	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Religious values, ethics and contribution: Hinduism, Islam, Christianity, Buddhism, Jainism and Sikhism	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Scope & Fields of social work- Family and Child welfare services, Welfare services for differently abled, Women welfare, Labour welfare, Medical Social work, Correctional services.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

VI	<p>Self Study for Enrichment (Not to be included for External Examination)</p> <p>Learners need to present application of methods of social work from the available literature, they should be able to relate social work to the basic concepts of social work, Learners need to gain knowledge about the professional organizations such as NPSWI, INPSW, NASW and IASW, Learners need to present the autobiography of the founders of each religion, Learners should prepare a list of institutions functioning for the practice of social work in their region.</p>	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
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Text Book:

Misra, P.D. (1994). Social work philosophy & Methods. Inter India Publication.

Reference Books:

1. Bhattacharya, S. (2003). Social Work – An Integrated Approach. Deep & Deep publication.
2. David Howe. (1987). An Introduction to Social Work Theory (community care practice Handbook). Routledge
3. Friedlander, W. A., & Apte, R. Z. (1968). Introduction to social welfare. Englewood, NJ: Prentice-Hall.
4. Heimsath, C. H. (2015). Indian nationalism and Hindu social reform. Princeton University Press
5. Rameshwari Devi & Ravi Prakash. (1998). Social work and Social Welfare Administration (Method and Practice). Mangal Deep Publication.
6. Sachdev Suresh. (2012). A Textbook of Social Work. Laxmi Publication.
7. Sanjay Roy. (2011). Introduction to Social Work & practice in India. Akansha publishing.
8. Singh, K. (2011). An Introduction to Social Work. ABD Publishers.

9. Skidmore, Rex A. (1991). Introduction to Social Work. Prentice Hall International
10. William, O, Larry Lorenzo Smith, Scott, W. Boyle. (2011). Pearson publishers

Web References

1. <https://egyankosh.ac.in/bitstream/123456789/17108/1/Unit-1.pdf>
2. <https://egyankosh.ac.in/bitstream/123456789/17105/1/Unit-2.pdf>
3. https://kkhsou.ac.in/eslm/E-SLM_Main/5th%20Sem/Bachelor%20Degree/BSW/HPSW/HPSW-3_-_with_changes_incorporated.pmd.pdf
4. <http://www.ignou.ac.in/upload/bswe-02-block1-unit-6-small-size.pdf>

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, and Case Study.

Course Designer

Dr.G.Mettilda Buvanewari

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22USW1CC2	STRUCTURE OF INDIAN SOCIETY AND INDIAN SOCIAL PROBLEMS	CORE	6	6

Course Objectives

- To recall the concepts of society and features of Indian Society.
- To relate the problems of Indian society and its transformation in modern times.
- To identify the preventive measures to deal the problems of the society to help the students
- To apply the principles and ethics to handle the social problems

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define, Recall, Remember and outline the concept of society, features of Indian society, Social Stratification, Social Problems.	K1,K2
CO2	Analyze the problems of Indian society and its transformation in modern times.	K3
CO3	Evaluate the preventive measures that are available to deal the problems of the society	K4
CO4	Assess,explain & evaluate the solutions related to each of the social problems	K5
CO5	Compile,Create,Modify solutions related to each of the social problems based on each of the community's resources and needs	K6

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	3	1	3	2	1	1	1
CO2	1	2	1	2	1	2	3	1	1	2
CO3	3	1	1	2	1	3	3	3	1	3
CO4	1	1	2	3	2	3	2	2	1	1
CO5	3	1	2	1	1	1	2	2	2	2

“1”- Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Society: Concept, Features and Elements of Society. Community: Concept, Characteristics, Types of Communities.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Social Stratification & Mobility: Concept, Characteristics, Types - Casteism, Religionism, Regionalism, Mobility– concept, types & causes of mobility.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Social Institutions & Social Control: Marriage, Family, Concept, Features, Types, Significance of Social Control, Agencies of Social Control, Techniques of Social Control.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Indian Social Problems: Poverty – Causes, Magnitude, Measures & Poverty Alleviation programmes, Unemployment, Illiteracy, Child Abuse – Types, Causes and Effects, Child Labour – Problem of Child Labour, Violence against Women – Nature, Extent, Characteristics.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Terrorism, Communalism, Substance Abuse – Nature, Types, Role of family & peer group in substance abuse, Measures to combat substance abuse.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
VI	Social process, Culture & Civilization, Acculturation, Cultural conflict, Cultural lag, Culture & Personality; Caste system in India, Theories of Caste system, Social Inequality &	-	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5, K6

	Exclusion, Patterns of Social Mobility; Other Social Institutions - Education, Economy, Religion, Political institutions, Examples of Social Control in India; Theoretical approaches to Social problems, Causes of Social Problems, Effects of Social problems, Corruption; Urbanization, Youth unrest & agitation, Population Explosion.		CO5, CO6	
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Text Books:

1. Miluwi, J.O (2014) Social Problems in India – Issues and Challenges, Mangalam Publications.
2. Baviskar & Patel, T (2011). Understanding Indian Society, Orient Blackswan Pvt Ltd.

Book References:

1. Atal, Y. (2016). Indian Society – Continuity and Change, Pearson.
2. Rao, S. (2015). Indian Social Problems – A Sociological Perspective, S.Chand & Company Limited.
3. Bhushan, V & Sachdeva, D.R. (2008). An Introduction to Sociology, Kitab Mahal Agencies, 40th Edition.
4. Kuppusamy, B. (2006). Social Change in India, Konark Publishers Private Ltd.
5. Singh, K (2001). Social Control and Social Change, Prakashan Kendra.

Web References

- 1) <https://www.webmd.com/mental-health/addiction/substance-abuse>
- 2) <https://www.drishtias.com/to-the-points/paper1/regionalism-in-india-upsc>
- 3) <https://www.sociologygroup.com/social-issues-in-india/>
- 4) <https://www.youtube.com/watch?v=mRWzIvccfkU>

Pedagogy

Lectures, Audios / Videos followed by discussion, PPT, Peer Learning and Student-led seminars.

Course Designer

Dr. T. Amirtha Mary

Semester I	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22USW1AC1	BASICS OF ECONOMICS AND POLITICAL SYSTEM	ALLIED	4	3

Course Objectives

- To introduce the concept of Economics and Economic Systems of Indian Society
- To understand the Indian Economic Policy with Globalization and political System

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define, Recall ,relate the concept of Economics & Political System of India	K1
CO2	Compare & Summarise the Indian Economic & Political Policy	K2
CO3	Identify,Analyse ,organise for Economic & political Development in India	K3
CO4	Categorise , Examine the systems of Economic & Political on participation & Development	K4
CO5	Assess, explain & evaluate the solutions related to each of the economic & Political Issues	K5

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	3	1	3	2	1	1	1
CO2	1	2	1	2	1	2	3	1	1	2
CO3	3	1	1	2	1	3	3	3	1	3
CO4	1	1	2	3	2	3	2	2	1	1
CO5	3	1	2	1	1	1	2	2	2	1

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamental Concepts of Economics: Introduction to Economics, Definition of Economics Resources, Production, Consumption, Demand and Supply and Redistribution of Wealth, Cost Efficiency and Scarcity, Principles of Economics.	12	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5
II	Economic Systems: Traditional Economic System–Features, Merits and Demerits and Contemporary Economic System–Capitalmarket economy-Features, Merits and Demerits.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Concept of Economic Development: Definition, Liberalization, Privatization and Globalization–Gross Domestic Product, Roles and Functions–Reserve Bank of India (RBI), World Bank, International Monetary Fund.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Political System: Concept, Types, Elements, Concept of State, Democracy, Power, Government Authority, Liberty, Justice, Equality, Indian Constitution –Fundamental Rights & Fundamental Duties.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	<p>Political Participation: Political Parties – National and State, Roles and Functions of Political Parties, Political Participation– Merits &Demerits.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not to be included for External Examination)</p> <p>Concept of Competition and market structures, consumers, demand, elasticity of demand, income distribution, market and prices, profits, price elasticity, Market economic and Mixed economics system, Sustainable development, Factors affecting economic growth, Advantages and disadvantages of representative democracy , Political Participation-definition, forms, types.</p>	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text books

- 1) Datt,G &Mahajan,A.(2016).Indian Economy,S., Chand Publishing.
Agarwal, M.D & Joe, S(2010), Business Economics, Ramesh Book Depot, Jaipur, New Delhi.
- 2) Sathyanarayan,B.(2009).Essay son Economic Liberalization and Reforms, Anmol Publisher.
- 3) Chandra,R.(2004).Globalization, Liberalization, Privatization and Indian Polity, Gyan Books;8 edition.

Reference Books

- 1) Karuppiah, S(2018). Indian Economy Key Concept, Kavin Mukhil Publications.
- 2) Bhat,S.(2017).Privatization&GlobalizationChangingLegalParadigm,EasternLaw House.
- 3) Datt,G &Mahajan,A.(2016).Indian Economy,S., Chand Publishing.
- 4) Agarwal, M.D & Joe, S(2010), Business Economics, Ramesh Book Depot, Jaipur, New Delhi.
- 5) Sathyanarayan,B.(2009).Essayson Economic Liberalization and Reforms, Anmol Publisher.
- 6) Chandra,R.(2004).Globalization, Liberalization, Privatization and Indian Polity,Gyan Books;8 edition.
- 7) Gupta,D.C.(1975).Indian Government and Politics,Vikas Publishing.
- 8) Varma,S.P.(1975).Modern Economic Theory,Vikas Publishing.

Website References

- 1) <https://byjus.com/commerce/fundamentals-of-economics/>
- 2) <https://corporatefinanceinstitute.com/resources/knowledge/economics/economic-system/>
- 3) <https://open.lib.umn.edu/sociology/chapter/14-2-types-of-political-systems/>

Pedagogy

Lectures, Audios / Videos followed by discussion, PPT, Peer Learning and Student-led seminars.

Course Designer

Ms.PL.Rani

Semester I			Marks:100	
COURSE CODE	COURSE TITLE	CATEGORY	Hours /Week	CREDITS
22UGVE	UGC JEEVAN KAUSHAL - UNIVERSAL HUMAN VALUES	ABILITY ENHANCEMENT COMPULSORY COURSE-I (AECC)	2	2

Course Objectives

1. To enable the learners to learn the values of love and compassion.
2. To foster the values of righteousness and service among the learners.
3. To enhance the morale of the learners by inculcating the values renunciation and peace.
4. To inspire the learners to practice the basic human values so as to make them become responsible citizens of the Nation.

Course Outcomes and Cognitive Level Mapping

On the successful completion of this course, the students will able to

CO Number	CO Statement	Cognitive Level
CO1	Define, Recall, explain, demonstrate and outline, Meaning, Definition the values of Love, Compassion, Truth, Non-Violence, Ahimsa, Righteousness and Service, Renunciation (sacrifice) & Peace.	K1, K2
CO2	Identify and apply the values of Love, Compassion, Truth, Non-Violence, Ahimsa, Righteousness and Service, Renunciation (sacrifice) & Peace.	K3
CO3	Analyse, categorize, compare, list, the values of Love, Compassion, Truth, Non-Violence, Ahimsa, Righteousness and Service, Renunciation (sacrifice) & Peace.	K4
CO4	Explain the values of Love, Compassion, Truth, Non-Violence, Ahimsa, Righteousness and Service, Renunciation (sacrifice) & Peace.	K5
CO5	Elaborate and Discuss the values of Love, Compassion, Truth, Non-Violence, Ahimsa, Righteousness and Service, Renunciation (sacrifice) & Peace.	K6

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Love and Compassion</p> <p>Introduction: what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.</p> <p>Love and Compassion and Inter-relatedness</p> <p>Love, compassion, empathy, sympathy and nonviolence</p> <p>Individuals who are remembered in history for practicing compassion and love.</p> <p>Narratives and anecdotes from history, literature including local Folklore</p>	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	<p>Truth and Non - Violence</p> <p>Introduction: what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)</p> <p>Individuals who are remembered in history for practicing this value</p> <p>Narratives and anecdotes from history, literature including local folklore</p> <p>Introduction: what is non violence? Its need. Love, compassion, empathy sympathy for others as prerequisites for non violence</p> <p>Ahimsa as non -violence and non- killing.</p> <p>Individuals and organisations that are known for their commitment to non - violence</p> <p>Narratives and anecdotes about non - violence from history and literature including local Folklore</p>	7	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
	<p>Righteousness and Service</p> <p>Introduction: What are Righteousness and service?</p> <p>Righteousness and dharma, Righteousness and Propriety</p>			

III	<p>Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings-living and non-living persons in distress for disaster.</p> <p>Individuals who are remembered in history for practicing Righteousness and Service</p> <p>Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local Folklore</p>	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	<p>Renunciation (sacrifice) & Peace</p> <p>Introduction: What is renunciation? Renunciation and sacrifice. Self- restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.</p> <p>Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.</p> <p>Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace</p>	6	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	<p>Practicing human values: what will learners learn gain if they practice human values? What will learners lose if they Don't Practice human values?</p> <p>Sharing learner's individual and/ or group experience(s)</p> <p>Simulated situations</p> <p>Case studies</p> <p>.</p>	5	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
VI	<p>Self Study for Enrichment</p> <p>Learners need to list ways of practising the values Love and Compassion, Truth and non-violence, Righteousness and Service, Renunciation (sacrifice) & Peace. Group Discussion needs to be conducted on strategies to promote human values at various levels – family, community, society, nation and global.</p>	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Website References

1. <http://gurdjiefffourthway.org/pdf/LOVE%20AND%20COMPASSION.pdf>
2. <https://iosrjournals.org/iosr-jhss/papers/Vol18-issue4/H01846769.pdf>
3. <https://www.youtube.com/watch?v=JaxIp8dyBBQ>
4. <https://core.ac.uk/download/pdf/38646904.pdf>
5. https://www.hartford.edu/unotes/_images/submitted_images/Renunciation%20as%20the%20Path%20to%20Happiness%20and%20Success_1603743763_file1.pdf

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, Flipped Classroom method, Case Presentation, video making, poster designing, preparation of Album and story writing .

Ability Enhancement Compulsory Course (AECC) I : UGC Jeevan Kaushal -

Universal Human Values (22UGVE)

Assessment Rubrics for 100 Marks

1. Designing Posters / video making / preparation of Album – **20 marks**
2. Case study presentation / Narration of stories / Writing stories – **20 Marks**
3. Writing essay based on the individual life experience following human values – personal, family and society level (minimum 10 pages) – **20 Marks**
4. VIVA VOCE - **40 Marks**

S.NO	Rubrics for VIVA VOCE	MARKS
1	Theoretical Knowledge	20
2	Values Practiced	10
3	Attitude & Commitment	10
Total		40

There will be no End Semester Examination for this course. The subject teacher will make an assessment of the students' performance based on the above-mentioned components and an internal VIVA VOCE will be conducted by the subject teacher and marks will be awarded and submitted to COE in the prescribed format specified by the Controller of Examinations with the approval of the Head of the respective Departments.

Course Designer

Dr.G.Mettilda Buvanewari

Semester II	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW2CC3	METHODS OF SOCIAL WORK	CORE	6	6

Course Objectives

1. To equip the students to learn the basic concepts of methods of Social Work.
2. To make the learners to understand dealing with individuals, groups and communities.
3. To enable the learners to make use of the principles of methods of social work in appropriate situations.
4. To educate the learners to identify the differences among the various methods of social work
5. To train the learners in the application of the methods of Social Work

Course Outcomes and Cognitive Level Mapping

CO NUMBER	CO STATEMENT On the successful completion of the course, the students will be able to	COGNITIVE LEVEL
CO1	Define, Recall, explain, demonstrate and outline social Case Work, Social group work, Community organization, Social Welfare Administration, Social Work Administration, Social action and Social Work Research.	K1,K2
CO2	Identify and apply Principals, process of Methods of Social Work	K3
CO3	Analyse, categorize, compare, list, Distinguish and examine objectives, principles and methods of Social Work	K4
CO4	Evaluate, justify and recommend application of roles of case worker, group worker and the community organizer.	K5
CO5	Elaborate and discuss the treatment techniques, roles and the different methods of Social Work	K6

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Direct Methods of Social Work: Social case work – definition, objectives, scope, principles and process (study, Diagnosis and intervention)-roles of a case worker.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Social group work: Definition, objectives and scope, types of groups and group processes; Group work process - roles of a group worker	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Community organization: Definition, objectives and scope, principles and processes - roles of a community organizer	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Indirect methods of social work: Social Welfare Administration and Social Work: Meaning; Purpose, principles, function and areas of administration; POSDCORB.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Social action: Its importance for social work practice. social work Research – meaning, aims, objectives and scope	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
VI	Self-study for Enrichment (Not to be included for End Semester Examinations)	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
	Learners need to make a presentation of application of methods of Social Work in different settings. Students can make a mini research study on any issue and submit a report. Students can share the practice of principles of case work, group work and community organization based on their field work experience			

Text Book:

Misra,P.D.(1994).Social work philosophy & Methods. Inter India Publication.

Reference Books

- Balgopal, P.R. Vassal, T.V.(1983). *Group on Social Work – An Ecological Perspective*. Macmillan Publication Co., New York.
- Friedlander, W.A.(1964). *Concepts and Methods of Social Work*. New Delhi, Prentice-Hall.
- Gore M. S.(1969).*Social work Education*. Asia publishing House.
- Konopka, G.(1963). *Social Group Work: A Helping Process*. Prentice – Hall, Inc. J.J.
- Kumar.S.(2002). *Methods for Community Participation – A Complete Guide for Practitioners*. Vistaar Publications. New Delhi.
- Mathew. G.(1992). *An Introduction to Social Case Work*. Tata Institute of Social Sciences, Mumbai.
- Misra.P.D.(1994).Social Work-Methods an Philosophy, Himalaya Publications, Delhi
- Paul Chowhry.D(1992). Social Welfare Administration, Atma Ram & Sons
- Ross, M.G: Harper and Row.(1967) *Community Organization: Theory, Principles and Practice*. Harper and Row, New York

Web References

1. https://www.russellsage.org/sites/default/files/Richmond_What%20is%20Social_0.pdf
2. <https://egyankosh.ac.in/bitstream/123456789/51363/1/Block-4.pdf>
3. <http://ignou.ac.in/upload/bswe-03-block1-unit-1-small-size.pdf>
4. <https://egyankosh.ac.in/bitstream/123456789/17228/1/Unit-1.pdf>
5. <https://egyankosh.ac.in/bitstream/123456789/17239/1/Unit-1.pdf>
6. <https://ccsuniversity.ac.in/bridge-library/pdf/Block-1Social%20Work%20Research.pdf>

Pedagogy: Lectures, Audios / Videos followed by discussion, PPT, and Student-led seminars.

Course Designer: Dr.G.Mettilda Buvaneswari

SEMESTER II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22USW2CC1P	FIELD WORK PRACTICUM	CORE	6	6

Course objectives

- To provide exposure to various NGO's and Government organisations
- To Acquire skills of observation and understand the social work intervention in various Institutions

Prerequisites

Basic understanding of fields of Social Work

Course outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Name the organisations working for women, children, Industries, old age homes, psychiatry settings, hospitals and De-addiction Centres	K1
CO2	Explain organizational structure, funding and functions	K2
CO3	Develop knowledge on welfare programmes implemented by the organisations	K3
CO4	Discover scope of social work in various settings	K4
CO5	Assess the Report writing skills	K5

Mapping of CO with PSO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	2	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	2
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	3	3	3	2	3	3	3	2	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Visits to the institutions working for

- Differently abled.
- Elderly.

- Children.
- Drug Addiction
- Health
- Environment
- Women
- Human Trafficking
- Human Resources

At least 10 visits to the above mentioned settings to be made in the II Semester.

- Students to be given classroom orientation regarding the agency/ setting prior to the field visit.
- Students are expected to write and submit detailed reports of their observation & remarks for each visit.
- Analysis and discussion to be held following report submission.

METHOD OF ASSESSMENT

INTERNAL

COMPONENTS	MARKS
Attendance in field work	5
Regularity in submitting reports	5
Observation during the visit	30
TOTAL	40

EXTERNAL

COMPONENTS	MARKS
Reporting	20
VIVA VOCE	
(i) Theoretical Knowledge	25
(ii) Communication and Presentation	15
TOTAL	60

Pedagogy: Observation visits , Interaction ,Documentation
Course Designer: Ms. S. Hema

SEMESTER II	Internal Marks :25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22USW2AC2	COMMUNICATION FOR SOCIAL WORKERS	ALLIED	5	3

Course Objectives:

1. To enable the students to understand the importance of Communication tools in dealing with social problems.
2. To study the different communication interventions in approaching the social problems.
3. To orient the students of how to use communication strategies in their social work practices.
4. To disseminate the advantages of communication tool among social workers.

Course Outcomes and Cognitive Level Mapping:

On the successful completion of the course, students will be able to:

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Define the concept and process of Communication, Interpersonal communication, Visual aids in communication, Communication planning and analysis in field	K1, K2
CO2	Identify the various tools used in different types of communication, communication planning and analysis	K3
CO3	Apply the Communication tools for Development	K4
CO4	Recommend the applications of Communication tools in social work practice among practitioners	K5
CO5	Elaborate and discuss the strategies used in different types of communications, communication campaign, advocacy and lobbying.	K6

Mapping of CO with PSO and PO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” Slight (Low) Correlation, “2”- Moderate (Medium) Correlation, “3” –Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Communication: Concept, Types -Verbal and Non-verbal communication, Visual and Written, Models, Process, Barriers and Importance of Communication, Key elements in the communication process.	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
II	Interpersonal Communication: Meaning, Types, Principles, Elements, Advantages of Interpersonal Communication	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5, K6
III	Visual Aids in Communication: Poster making, Notice boards, Flip charts, Flash cards, Photographs, Pamphlets, Slide shows, Mass communication- Television, exhibition, newspapers and magazines, advertisement, radio, film, VCD/ DVD.	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5, K6
IV	Communication Planning and Analysis: Meaning & Concept of Communication Planning	12	CO1,CO2,CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	and Communication campaign, Education and communication for national development.			
V	Communication as a tool for Social Workers: Importance of Communication in handling Social problems, Lobbying and Advocacy, Various online tools in dealing with Social Problems.	12	CO1,CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5,K6
VI	Self-Study portions: (No included for End semester examination) Communication strategies practiced in various settings - Community, Medical, Psychiatric, Family, Industrial etc.,	-	CO1,CO2,C O3,CO4,CO5	K1,K2,K3,K4, K5,K6

TEXT BOOK:

Singh, D. (2011). Communication & Interpersonal Skills for Social Work, Indian Books & Periodicals

REFERENCE BOOKS:

1. D'Souza, Y. K (1999). *Communication Today and Tomorrow*, Discovery Publishing House, New Delhi.
2. Fullmer, D.W. and Bernard, H.W (1972). *Communication in Organizations*, Second Edition, Mumbai: Jaico Publishing House.
3. Koprowska, J. (2005). *Communication and Interpersonal Skills*, Learning Matters.
4. Lishman, J (2009). *Communication in Social Work*, Red Globe Press (2nd edition).
5. Mishra, R.K (2018). *Professional Communication Skills- An Approach towards bright career*, Satyam Law International.

ONLINE REFERENCES:

1. <https://www.skillsyouneed.com/ips/what-is-communication.html>
2. <https://www.simplilearn.com/what-is-interpersonal-communication-article>
3. <http://introtocommopenresource.ridgewater.edu/ModuleVIII/ModVIISect8.html>
4. <https://www.slideshare.net/MediaKitchen/communications-planning-what-it-is-a>
5. <https://study.com/academy/lesson/effective-communication-methods-in-a-social-work-practice.html#:~:text=Effective%20communication%20is%20extremely%20important,d ecisions%20and%20understand%20difficult%20information.>

Pedagogy: Lectures, Audios / Videos followed by discussion, Case Study presentations, PPT, Peer Learning and Student-led seminars.

Course Designer: Dr. T. Amirtha Mary

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with "A" Grade by NAAC

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TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF SOCIAL WORK



SYLLABUS

**MASTER OF SOCIAL WORK
2022-2023 and onwards**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF SOCIAL WORK

VISION

The vision of our department is to advance the personal, social, intellectual and personality of the students through social work education so as to achieve higher positions in serving the society across local and global community systems.

MISSION

- To orient the students acquire knowledge, skills and values of Social Work and develop an attitude of commitment towards social work profession.
- To train the students in the fields of Social Work by enabling the practice and application of theory through field work trainings.
- To inculcate values by means of conducting programmes through various associations attached to the department.
- To mentor the students through tutor-ward system in the department.
- To extend wider exposure to students in the field of Social Work through organizing National & International seminars, workshops, symposium etc and enable them to establish contacts with academicians, field experts, high profile personalities in different fields.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR MSW PROGRAMME

PO NO.	PROGRAMME OUTCOMES On completion of MSW Programmes, the students will be able to
PO 1	Exhibit comprehensive knowledge in confronting the issues and challenges that arise in the society and apply in life circumstances. (Social Responsibility)
PO 2	Achieve in-depth knowledge in various genres of literary texts to contribute the best for the society and to create a better world. (Exploring Success)
PO 3	Perceive leadership skills through higher learning and be a visionary to achieve the target. (Professional Competence)
PO 4	Identify appropriate resources required for research projects and explore novel ideas to gain real life experience through internships. (Discover Innovations)
PO 5	Create a scientific attitude and aptitude to undertake research studies for higher learning and career opportunities. (Build Scientific Temperament)

PROGRAMME SPECIFIC OUTCOMES FOR MSW PROGRAMME

PSO NO.	PROGRAMME SPECIFIC OUTCOMES On completion of MSW Programmes, the students will be able to	POs Addressed
PSO 1	Show knowledge in professional social work and apply the principles to the needs of the Government and Non-government organizations, Industries and Community development projects.	PO1, PO2
PSO 2	Analyze the issues and problems of the vulnerable sections of the society and ensure just and human conditions for a better world.	PO2
PSO 3	Demonstrate leadership skills and professional ethics in promoting communal harmony and Nation Building.	PO3
PSO 4	Design solution initiatives for complex problems through taking up research projects paving way for policy formulation and contribution to funds of knowledge through theory building.	PO1, PO4
PSO 5	Develop scientific attitude and behaviour in approaching social issues, problems and exhibit enhanced professional competence in social work practice.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
PG AND RESEARCH DEPARTMENT OF SOCIAL WORK
MASTER OF SOCIAL WORK
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For candidates admitted from the academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / Week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Philosophy of Social Work and Society	22PSW1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Social Work Profession with Individuals and Groups	22PSW1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Community Organization and Social Action	22PSW1CC3	6	5	3	25	75	100
	Core Practicum - I (CP)	Social work Practicum(p)	22PSW1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	A) Human Resource Management	22PSW1DSE1A	6	3	3	25	75	100
		B) Management of Organizations	22PSW1DSE1B						
		C)NGO Management	22PSW1DSE1C						
Total				30	23				500

15 Days INTERNSHIP during Semester Holidays

II	Core Course– IV (CC)	Social work Research and Social Statistics	22PSW2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Social Welfare Administration and Social Policy	22PSW2CC5	6	5	3	25	75	100
	Core Practicum - II (CP)	Social Work Practicum (P)	22PSW2CC2P	6	5	3	40	60	100
	Core Choice Course– I (CCC)	A. Counselling: Theory and Practice	22PSW2CCC1A	6	4	3	25	75	100
		B. Psychology for Social Workers	22PSW2CCC1B						
		C. Youth and Marginalized Sections	22PSW2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. Family Social Work	22PSW2DSE2A	6	3	3	25	75	100
		B. Disaster Management	22PSW2DSE2B						
		C. Health and Hygiene	22PSW2DSE2C						
	Internship	Internship	22PSW2INT	-	2	-	-	100	100
Extra Credit Course	Swayam Online Course	To be fixed later	As per UGC Recommendation						
Total				30	24				600

III	Core Course– VI (CC)	Cyber Security	22PGCS3CC6	5	4	3	25	75	100
	Core Course – VII (CC)	Specialization –I Public Health	22PSW3CC7A	6	5	3	25	75	100
		Women welfare and Health	22PSW3CC7B						
		Human Resource Development	22PSW3CC7C						
		Rural and Tribal Community Development	22PSW3CC7D						
	Core Practicum – III (CP)	Social Work Practicum (P)	22PSW3CC3P	6	5	3	40	60	100
	Core Choice Course–II (CCC)	Specialization –II A.Medical Social work	22PSW3CCC2A	6	5	3	25	75	100
		B.Child Rights and Child Protection	22PSW3CCC2B						
		C.Labour laws and Industrial Relations	22PSW3CCC2C						
		D.Urban Community Development	22PSW3CCC2D						
	Discipline Specific Elective Course-III (DSE)	A. Social Work for Competitive Examinations	22PSW3DSE3A	-	-	2	-	100	100
B.Computer Skills for Social Workers		22PSW3DSE3B	4	3	3	25	75	100	
C.Environmental Social Work		22PSW3DSE3C							
Generic Elective Course -I (GEC)	Indian Social Problems	22PSW3GEC1							3
Extra Credit Course	Swayam online Course	As per UGC Recommendation							
Total				30	24				600

IV	Core Practicum-IV (CP)	Social Work Practicum (P)	22PSW4CC4P	6	5	3	40	60	100
	Core Practicum -V (CP)	Block Placement (P)	22PSW4CC5P	6	5	3	40	60	100
	Core Choice Course– III (CCC)	Specialization III A. Psychiatric Social Work	22PSW4CCC3A	6	4	3	25	75	100
		B. Welfare of the youth and Aged	22PSW4CCC3B						
		C.Organizational Behaviour	22PSW4CCC3C						
		D. Development Planning,Policy and Practice	22PSW4CCC3D						
	Generic Elective Course- II (GEC)	Welfare of the Disadvantaged Sections	22PSW4GEC2	3	2	3	25	75	100
Research Project	Research Project Work	22PSW4PW	9	5	3	Evaluation 80 Viva 20		100	
Total				30	21				500
Grand Total				120	9				2200

Semester I	Internal Marks: 25			External Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	Hours / Week	CREDITS
22PSW1CC1	PHILOSOPHY OF SOCIAL WORK AND SOCIETY	CORE	6	5

COURSE OBJECTIVES

- To introduce the history and ideologies concerning Social Work
- To understand fundamental objectives of social work profession, its values, and ethics as linked to contemporary ideology for social change.

Prerequisites

Basic understanding on society and on social work profession

Course Outcome and Cognitive Level Mapping

CO NO	CO Statement	Cognitive Level
	On Successful Completion of the course, the students will be able to	
CO1	Remember and understand the history of Social Work, basic concepts in social work and society and social problems	K1, K2,
CO2	Apply the primary and secondary methods of social work	K3
CO3	Analyse the principles of social work and tools and techniques in social work	K1, K2, K3, K4, K5, K6
CO4	Explain the voluntary social work and professional social work	K1, K2, K3, K5, K6
CO5	Elaborate on the distinctiveness of Social Work as a Profession and professional membership	K1, K2, K3, K4, K5, K6

Mapping of CO with PO and PSO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	2	3	2	2	2
CO2	2	2	3	3	3	2	2	2	2	2
CO3	3	3	3	2	2	2	2	2	2	2
CO4	3	2	3	2	3	2	2	2	2	2
CO5	3	3	3	3	3	2	2	2	2	2

“1”-Slight (Low) correlation, “2”-Moderate (Medium) Correlation

“3”-Substantial (high) Correlation, “-”-Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Social Work: Concept, Definition, and Historical development of Social Work in UK, USA, and India; Concepts: Social Service, Social welfare, Social Security, Social Defense, Social Justice, Social Development, and Social Reform.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
II	Social Work as a Profession: Nature and scope, objectives; philosophy and principles, functions, values and ethics. Social work education and profession, professional values, training; skills, tools and techniques, professional social work and voluntary social work. National and International Professional Organizations in Social Work: NAPSWI, INPSW, NASW, IASW.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Methods of Social Work: Social case work – social group work – community organisation – social work research – social welfare administration – social action.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Concepts of Society: Community, association, institution, social groups, culture and its elements, social stratification, social processes, social change – social movements and social control. concept of urbanisation, industrialisation, modernisation – social disorganization.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5

V	Social Problems: Poverty, Over-population, Unemployment, Corruption, Dowry, Suicide, Drug abuse, Juvenile Delinquency, alcoholism, HIV/AIDS, problems of women, children and aged, Persons with Disabilities, and LGBT.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Unit VI: Self study for Enrichment (Not included for End Semester Examinations) Learners should prepare an assignment on Social Reform movements in India- its impacts on Social Work profession. Learners should find out the procedures for membership in NAPSWI , INPSW .NASW and IASW). Students can collect details about each field by pay a visit to the organisations. students can prepare a e contents on the social institutions.) Students can collect details regarding social problems and can collect data from secondary sources like Newspapers, Research documents, Government websites etc.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

- 1.Singh.K.K.(2010). Singh .R.S.An Introduction To Social Work.New Delhi: Penguin Books Ltd
2. P D Misra .(1994). Social Work Philosophy and Methods.New Delhi:Inter India Publications.

Reference Books

1. Bhattacharya, S. (2008). Social work – An Integrated Approach, New Delhi: Deep & Deep publication Pvt.ltd.
2. Bhusan, Vidya & Sachdev (2006). An Introduction to Sociology.Allahabad:Kitab Mahal.
3. Mishra, P D. 1994.,.Social Work Philosophy & Methods. New Delhi :Inter India Publications

4. Nitesh Dhawan (2011). Social Work Perspectives, Philosophy and Methods. Lucknow: Bharat Book Centre.
5. Otta, B.M. (2014). Social work theory and Practice, New Delhi: S.K Book Agency.
6. Patel A.K. and Dubey M.V. (2010). Methods of Social Work, New Delhi: Crescent Publishing Corporation .
7. Rathod, S. (2013). Skill training for Social Workers, Jaipur : Yking Books .
8. Rao, S. C.N. (2015). Indian Social Problems- A Sociological Perspectives, New Delhi : S.Chand & company Pvt Ltd.
9. Sharma, R.K. (2013). Social problems and Welfare, U.P: Atlantic publishers and distributors(p) ltd .
10. Sen S.K. (2007). Social work practices, Jaipur., India: Book Enclave.
11. Singh, K.K., & Singh, S.R. (2011). Social work and Family intervention. New Delhi : Abd Publishers.
12. Tanuja, S. Tridevims and Natarajan, R. (2014). Future of Social Work, Arunachal Pradesh: Jnanda Prakashan (P&D) .
13. Verma ,S. (2014). Social work and Social Welfare, New Delhi : Avon Publications.
14. Yogesh Atal (2006). Changing Indian Society, Jaipur.: Rawat Publication.

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1. Historical development of social work
https://kkhsou.ac.in/eslm/E-SLM_Main/5th%20Sem/Bachelor%20Degree/BSW/HPSW/HPSW-3_-_with_changes_incorporated.pmd.pdf
2. History of Social Work profession in India : Subject Social Work <https://epgp.inflibnet.ac.in>
3. Origin & Growth of Social Work Profession, <https://youtu.be/06hfW8I-p34>
4. Introduction To Social Work <https://youtu.be/LtaCmORiP9A>
5. A Brief History of Social Work <https://youtu.be/yeqbxwDheJI>
6. Professional social work: nature, scope, goals and functions
<https://egyankosh.ac.in/bitstream/123456789/17108/1/Unit-1.pdf>
7. Social Work Methods <https://ddceutkal.ac.in/Syllabus/MSW/Paper-5.pdf>
8. Introduction to sociology https://rgu.ac.in/wp-content/uploads/2021/02/Download_636.pdf
9. Society, Social Institutions and Social Problems
<https://egyankosh.ac.in/bitstream/123456789/71869/1/Block-4.pdf>

Pedagogy

Chalk & Talk, Seminar & Assignments, Group Discussion, Case Study, e-content, Google classroom

Course Designer: Dr.O.Aisha Manju

Semester I	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22PSW1CC2	SOCIAL WORK PROFESSION WITH INDIVIDUALS AND GROUPS	CORE	6	5

Course Objective

To acquire complex skills of working with individuals and families in various situations and settings.

Prerequisites:

Basic knowledge in dealing with individuals & Groups

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define, Identify Knowledge in dealing with Individuals & Groups and basic concepts of case work and Group work	K1, K2
CO2	Demonstrate the characteristics of caseworker client relationship and concepts of programme planning Understand the case work Process and group work process	K3
CO3	Apply the principles, skills and techniques of case work and Group work	K4
CO4	Evaluate the role of Case worker and Group Worker in different Settings	K5
CO5	Plan, construct the Application of case Work & group work method in different settings	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	2	1	3	3
CO2	3	3	3	3	3	3	1	1	3	1
CO3	3	3	3	2	3	3	1	1	3	3
CO4	3	3	3	2	3	3	3	2	3	2
CO5	3	3	3	2	3	2	3	2	2	1

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Case Work:</p> <p>Historical Development; Scope, Limitations, Importance and Relationship with other Methods of Social Work, Basic Components of Social Case Work: Person, Problem, Place and Process, Principles of Case Work.</p> <p>Case Worker-Client Relationship:</p> <p>Meaning and its Importance. Characteristics of Professional Relationship: Empathy, Transference and Counter Transference, Resistance, Sustaining the Relationship, Genuineness, Unconditional Positive regard and Self Disclosure.</p>	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5 ,K6
II	<p>Case Work Process - Intake and Exploration, Introduction to the Role of Psychological Testing in Assessment, Psychosocial Diagnosis, Formulation of Goals, Prioritization of Needs, Development of Action Plan, use of Contracts; Intervention: Direct and Indirect Techniques; Involvement of Collateral Contacts, Home Visits and its Importance. .Case Work and Communication: Meaning, purpose, importance, principles, elements in communication process, types, importance of listening, observing and feedback, communication barriers and ways to overcome them; importance of interpersonal communication in casework. Approaches to Practice: Psychosocial, problem solving, crisis intervention; behavior modification, functional and development of an eclectic model for practice</p>	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5, K6
III	<p>a. Social group work: concepts-assumptions, purpose, goals, principles, and values of group work, and historical development of group work; group work as a method of social work and its relation to other methods of social work. b. Group work process: Intake and study: selection of members, composing group, orienting the members, preparing the environment, goal setting, motivation, use of</p>	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5, K6

	<p>home visits, and collateral contacts. c. Assessment- preparing for group work, first meetings-interviewing, ground rules for group work meetings, group roles and responsibilities, group meetings, d. Intervention/treatment: problem identification, making them work, dealing with difficulties within the group, group presentations, group work evaluation- meaning and its place in group work. e. Evaluation: steps in-group work evaluation and criteria for good group work and checklist for group work evaluation, v. Termination- reaction to termination and vi. Follow up.</p> <p>b.Group work supervision: concepts, need, tasks, types, purpose, and functions, techniques and conditions for good supervision.</p> <p>b. Leadership in group: concepts, definition, characteristics, functions, qualities of leader, types and theories of leadership; training for leadership; sociometry and sociogram.</p>			
IV	<p>a. Programme planning: meaning and definition of programme, principles and process of programme planning and the place of agency in programme planning.</p> <p>b. Programme laboratory- values and techniques: games, singing, dancing, dramatics, street play, puppetry, group discussions, parties, excursion, psychodrama, socio-drama, role play, brain storming, camping- planning and conducting camps; stages of group development and use of programme for group development: orientation stage, working stage, termination stage, programme planning, implementation, and evaluation.</p> <p>b. Models and approaches: social goal model, remedial and reciprocal model; group therapy/group psychotherapy/ therapeutic /social treatment, development group and task-oriented group.</p>	18	CO1 CO2 CO3 CO4 CO5	K1,K2,K3,K4,K5 ,K6

V	Recording: meaning, sources and types-process record- person oriented and problem oriented records and its components; summative record; principles of recording, uses, and maintenance of record. Scope and practice of social case work & Social Group work, Application of Case work and Group work method in different settings; community settings, medical and psychiatric settings, family and child welfare settings and the aged homes, schools, Special Schools, correctional institutions, industries, and skills of case worker & group worker. Limitations of Social case work practice in India.	18	CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5, K6
VI	Self study for Enrichment (Not Included for End Semester Examinations) Write down the experience of establishing relationship, (Learners to conduct 1 case work and submit report) Plan & Implement any one group work submit a detailed report, Visit any one of the settings & observe the case work & group Work and record your observation and submit a detailed report.		CO1 CO2 CO3 CO4 CO5	K1, K2, K3, K4, K5, K6

Text Book

- 1.Upadhyay.R.K.(2010). Social case work-A therapeutic Approach, Jaipur: Rawat Publication
- 2.Sanjay Bhattacharya (2003), Social work :An Integrated Approach, Deep & Deep Publications

Reference Books

- 1.Adams .R (2012).*The short guide to social work*. Rawat Publication & Vikas Publishing House.
- 2.Mathew Grace (1992).An Introduction to Social Case Work, Bombay : Tata Institute of Social Sciences
- 3.Altmaier, E. M., Hansen, J.C..(2012), The Oxford Handbook of Counseling Psychology New York: Oxford University Press.
- 4.Hamilton, Gordon (1970),The New York School of Social Work : Theory and Practice of Social Case Work London : : Columbia University Press
- 5.Hollis, Florence and Woods, Mary E.(1981).Casework – A Psychoisoical Therapy New York

: Fandom House

6. Paylor.I., Measham.F., Asher.H .(2013) Social work and Drug use Jaipur : Rawat Publications
7. Glassman, Urania.(2008).Group Work: A Humanistic and Skills Building Approach, SAGE Publications
8. Konopka, Gisela (1972).Social group work: A helping process. Prentice-Hall
9. Lifton, Walter M. (1966).Working with Groups, Wiley
10. Siddiqui, H. Y (2008).Group Work: Theories and Practices Jaipur: Rawat Publications

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1. <https://www.egyankosh.ac.in/bitstream/123456789/76167/1/Unit-1.pdf>
2. <https://www.socialworkin.com/2021/12/Client-case-worker-relationship-in-social-case-work.html>
3. <https://www.yourarticlelibrary.com/sociology/social-casework-processes-study-and-diagnosis/36564#:~:text=ADVERTISEMENTS%3A,rope%20woven%20of%20multiple%20strands>.
4. [https://en.wikipedia.org/wiki/Group_work#:~:text=Social%20group%20work%20is%20a,\(Marjorie%20Murphy%2C%201959\)](https://en.wikipedia.org/wiki/Group_work#:~:text=Social%20group%20work%20is%20a,(Marjorie%20Murphy%2C%201959)).
5. <https://www.slideshare.net/BimalAntony/group-work-process-23990034>
6. <https://www.youtube.com/watch?v=Yunbt4u9uWg>
7. <https://www.youtube.com/watch?v=ausahOeYOMQ>

Pedagogy

Lectures, Seminars, Case Presentations, Discussion, Observation, Role Play, E- contents

Course Designers

Dr.S.Vidhya, Ms.PL.Rani

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW1CC3	COMMUNITY ORGANIZATION AND SOCIAL ACTION	CORE	6	5

Course Objectives

- To facilitate Communities towards self-directed change
- To justify the importance of theories, practices and approaches of Community Organization and Social action

Prerequisites:

Basic knowledge on communities.

Course Outcomes and Cognitive Level Mapping

CO NO	CO Statements	Cognitive Level
CO1	Remember and understand the history of Community Organization and basic concepts of Community Organization	K1, K2, K3, K4, K5, K6
CO2	Analyze the process of Community Organization and Social Action	K1, K2, K3, K4, K5, K6
CO3	Evaluate the importance of Community Participation in Rural, Urban & Tribal Development	K1, K2, K3, K4, K5, K6
CO4	Justify the importance of theories, practices and approaches of Community Organization and Social Action	K1, K2, K3, K4, K5, K6
CO5	Develop models in Community Organization.	K1, K2, K3, K4, K5, K6

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	1	3	3	1	3	2	1	1	1
CO2	1	2	1	2	1	2	3	1	1	2
CO3	3	1	1	2	1	3	3	3	1	3
CO4	1	1	2	3	2	3	2	2	1	1
CO5	3	1	1	2	2	1	1	2	3	3

“1”-Slight (Low) correlation,
 ”3”-Substantial (high) Correlation,

”2”-Moderate (Medium) Correlation
 ”-“-Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Community: Meaning, Classifications, and Characteristics; Community Power Structure; Community Dynamics: Integrative and disintegrative processes in the community. Concept of Community development. Similarities and Differences between Community Development and Community Organization, History of Community Organization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Community Organization: Concept, definition, objectives, philosophy, approaches, principles and skills; Community Organization as method of social work; Phases Of Community Organization: Community relationship, Study, Analysis, Assessment, Discussion, Organization, Action, Evaluation, Modification and Continuation. Models of Community Organization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Community Organisation Practice: Focus Groups; Analysis of Power Dynamics in Various Community Mobilization for Participation, Involvement in Problem solving Process, Identification of Needs, Issues, Prioritization, Problem Analysis, Selection of Alternatives, Community based Organisation Building and Federating for Sustained Problem-Solving Action. Strategies in Community Organisation; Organising Conferences, Training	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	programmes, Consultation, Negotiation and networking.			
IV	Application of Community Organisation: Community Organisation in different fields- Health, Education, Correctional, Rural, Urban and Tribal Communities, Vulnerable sections, Disaster, Displaced Population and Rehabilitation, Peace and Peace building, Empowerment of Marginalised Groups and communities, Practice skills, Research skills for Community Work, Various Roles of Community Organiser.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Social Action: Definition, objectives, principles, methods and strategies; Social Action as a method of Social Work; Social Action and social reform; Radical Social Work, Saul Alinsky and Paulo Freire's methods; Process of Social Action; Scope of social action in India; Role of social workers in Community Organization and Social Action and Community Empowerment.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self study for Enrichment (Not Included for End Semester Examinations) Caste system in India, Theories of Caste system, Social Inequality & Exclusion, Patterns of Social Mobility, Leadership, and theories of Leadership, Community Participation, Community Organization as a macro method, Community work, Nature of Different Communities with their strength and weakness, Current issues in Community Organization, Gender sensitivity issues in Community Organization, Advantages of Social Action, Examples of Social Action in India and abroad.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

- 1) Joseph, S.(2012). Community Organization in Social Work, Discovery Publishing house.
- 2) Lee, B.(2011). Pragmatics of Community Organization, Common Act.

References

- 3) Guha, A. (2013) .Community Organization and Social Action, Centrum press.
- 4) Patil, A.R (2013) Community Organisation and Development: An Indian Perspective New Delhi: PHI Learning
- 5) Joseph, S.(2012). Community Organization in Social Work, Discovery Publishing house.
- 6) Lee, B.(2011). Pragmatics of Community Organization, Common Act.
- 7) Christopher, A.J & William A.T (2009)Community Organisation and Social Action New Delhi: Himalaya Publishing.
- 8) Rothman. J(2001) Strategies of Community Interventions and Macro Practice(6th Ed)
- 9) Sidduque,H.Y.(1997).Working with Communities: An Introduction to Community Work, Hira Publications
- 10) Sidduque,H.Y.(1984).Social Work and Social Action, Hira Publications
- 11) Parsons, T. (1967). The Structure of Social Action, Free Press
- 12) Ross,M. G.(1955).Community Organization: Theory and Principles

Web References

- 1) <https://mgkvp.ac.in/Uploads/Lectures/32/2531.pdf>
- 2) <https://www.notesonzooology.com/ecology/communities-meaning-types-and-characteristics-zoology/4324>
- 3) <http://ignou.ac.in/upload/bswe-03-block1-unit-1-small-size.pdf>
- 4) <https://egyankosh.ac.in/bitstream/123456789/50437/1/Block-2.pdf>
- 5) <https://ctb.ku.edu/en/table-of-contents/assessment/promotion-strategies/systems-advocacy-and-community-organizing/main>
- 6) http://www.govtgirlsekbalpur.com/Study_Materials/Sociology/Sociology_Sem-V_CC-11_Social_Action_and_Ideal_Types.pdf

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion and Case Study

Course Designer

Dr.G.Kanaga

Semester I	Internal Marks:40	External Marks:60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22PSW1CC1P	SOCIAL WORK PRACTICUM	CORE	6	5

Course Objectives

1. To give an opportunity to the students to put into practice the theory learnt in the classroom in the real life situation.
2. To expose to the students the various governmental and non-governmental organizations working for the welfare of the needy, downtrodden and vulnerable through observation visits.
3. To kindle the students' interest to learn the standard of living of Rural and Tribal people through social work camps and inspire them to develop a desire to serve them.
4. To train the students in developing various skills through taking up group projects on social issues/problems

Prerequisites

Students need to possess basic knowledge on the kind of Social Welfare organizations functioning for the needy, down trodden and vulnerable.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	COGNITIVE LEVELS
CO1	Relate classroom learning in the field	K2
CO2	Identify different agencies of social work practice	K3
CO3	Discover emerging problems of rural, urban and tribal people	K4
CO4	Appraise means of Programme Planning	K5
CO5	Create models to work with emerging problems in the society.	K6

Mapping of CO and PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	1	3
CO2	3	3	3	3	3	2	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) Correlation, “-” indicates there is no correlation.

Syllabus

1. Orientation: A detailed instruction about field work, objectives importance of field work. Orientation provides information regarding: (1) the importance and place of the practice in the social work education and (2) the purpose, functions, and ethics in professional practice

2. Observation Visits:

The purpose of the observation visits is to acquire skills of systematic observation and to develop a spirit of inquiry; to understand society's response to social problems through various services, understand and appreciate, to develop the ability to critically evaluate the initiative of voluntary and government programmes, and to develop an appreciation of social work intervention in these programmes.

A minimum of 10 visits to different social agencies with at least two settings pertaining to each field of specialisation. Suggested fields:

Health Setting: Hospitals, Psychiatric hospitals/clinics de-addiction centres, community health extension projects, district mental health programmes /projects, PHCs, etc

Educational Setting: Formal schools, non formal / adult education centres, etc.

Services for special groups: like differently abled, destitute, elderly- both institutional and non institutional

Community settings village visits, Corporations, municipalities, Panchayat Samitis etc.

Criminal Justice system: observation homes, jails, etc.

3. Rural /Tribal Camps provide opportunities to experience rural and tribal life, analyse rural and tribal dynamics, and observe the functioning of local self government and voluntary agencies. This experience helps peer participation in planning for activities for own group and for the local people. It helps to carry out, evaluate, and report the experience. It also helps the social work trainees in planning, organising, budgeting, mobilising, implementing and evaluating the projects to be implemented during the camps besides exposing their histrionic talents. The camps should be for a minimum of seven days organised by the Social Work students on a self supporting basis.

4. Group awareness project on social issues / problems – Minimum of 10 days to be allotted for this purpose. A programme should be organised by the group. Each group must comprise of 3-5 students. Suggested themes such as anti – dowry campaign, HIV/AIDS awareness, gender sensitization, alcoholism, and drug awareness, suicide prevention or any social problem could be considered.

Evaluation: Total Marks – 100**Internal Evaluation- 40 marks**

S.No	Internal	Marks	Total
A	Field Orientation Visits		10 marks
	(i) Observational Skills	3.5 marks	
	(ii) Reporting	3.5 marks	
	(iii) Attendance for Filed Work	3 marks	
B	Rural/Tribal Camp		15 marks
	(i) Individual Participation	5 marks	
	(ii) Initiative and Leadership	5 marks	
	(iii) Community Involvement	5 marks	
C	Group Awareness Project		15 marks
	(i) Organizing Ability & Team Work	5 marks	
	(ii) Resource Mobilization	5 marks	
	(iii) Social Relevance	5 marks	
TOTAL			40 MARKS

External Evaluation – 60 marks-VIVA-VOCE

S.NO	EXTERNAL	MARKS
1	Theoretical Knowledge	15
2	Practice Skills	15
3	Mobilizing Resources	10
4	Communication and Presentation	10
5	Reporting	10
Total		60

Pedagogy

Observation visits, organizing group Projects, Planning and implementing activities in camp, Organizing community outreach programmes.

Course Designer: Dr.G.Mettilda Buvaneswari

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	Category	Hours/Week	Credits
22PSW1DSE1A	HUMAN RESOURCE MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To introduce the students to the basics of human resource management (HRM).
- To provide an overview of the functional areas of HRM.
- To lay the foundation for a deeper understanding of and practice in the field of HRM

Prerequisites

Basic knowledge on Human Resource Management and its functions

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the Successful completion of the course, students will be able to	
CO 1	Recall and explain the basic concepts in Human Resource Management	K1, K2
CO 2	Apply the Various functions of Human resource management	K3
CO3	Analyse the skills involved in acquisition, maintaining and developing of Human Resources	K4
CO4	Assess the Roles of Human Resource managers in various settings	K5
CO5	Invent the new trends in the field of Human Resource management	K6

Mapping of CO and PO and PSO

CO/PO	PSO 1	PSO 2	PSO 3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	2	2	3	2	2	2
CO2	2	1	2	2	2	2	2	2	2	3
CO3	2	2	3	2	2	2	3	3	3	3
CO4	2	2	1	1	2	2	2	2	2	2
CO5	1	1	1	1	2	2	2	3	2	3

“1”-Slight (Low) correlation, “2”-Moderate (Medium) Correlation

”3”-Substantial (high) Correlation, ”-“-Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	INTRODUCTION TO HUMAN RESOURCE MANAGEMENT: Concept, Objectives, Importance and Functions of Human Resource Management, Human Resource Development-Meaning and Objectives, Difference between HRM and HRD, Human capital management, Concepts of HR philosophy, HR policy, HR audit and HR Information Systems	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	ACQUISITION OF HUMAN RESOURCES: Human resource planning: concept, objectives, process. Job analysis: concept, purpose, methods. Difference between Job analysis, Job specification, Job description, Job evaluation. Recruitment: concept and sources. Difference between Recruitment and Selection, Employee Induction and Placement.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	EMPLOYEE WELFARE: Employee Welfare-Meaning, Objectives, Philosophy, Scope, types of employee welfare - statutory and non-statutory welfare measures and Labour welfare theories.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	MAINTENANCE OF HUMAN RESOURCES: Compensation and benefits administration: concept and components of remuneration (wages and salary, incentives, fringe benefits, perquisites, non-monetary benefits). Determinants of compensation patterns (legislations, job evaluation, surveys, components of the pay structure). Rewards: Concepts and types.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	DEVELOPMENT OF HUMAN RESOURCES: Training and Development -concept and difference between employee training and management development, Training process and methods (on the job training and off the job training). Management Development Methods.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	<p>SELF STUDY FOR ENRICHMENT (Not included for End Semester Examination)</p> <p>Green HRM, Human Resource Business Partner, Selection – concept, process and devices (application forms, employment tests, Interviews, Realistic job previews, background investigation, physical examination), Criteria for distributing rewards.</p> <p>Difference between Performance-based pay and Competence-based pay, Laws related to Welfare, Training effectiveness: Concept and Methods of evaluating training effectiveness</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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Reference Books

1. Aswathappa, K. (2010). Human Resource Management – Text and Cases. Tata McGraw Hill, New Delhi.
2. DeCenzo, David A. and Robbins, Stephen P. (2007). Personnel / Human Resource Management (3e). Prentice – Hall of India, New Delhi.
3. Dessler, Gary and Varkley, B. (2011). Human Resource Management (12e). Pearson, New Delhi.
4. Fisher, Cynthia, D., Schvenfeldt, Lyle.F., & Shaw, James, B. (2008). Human Resource Management (6e). Bizantra, New Delhi.
5. Ivancevich, John.M. (2007). Human Resource Management (10e). Tata McGraw Hill, New Delhi.
6. Rao, V.S.P. (2005). Human Resource Management – Text and Cases (2e). Excel Books, New Delhi.
7. Charles R. Greer, (2003). Strategic Human Resource Management, Pearson Education Pvt Ltd.
8. Jeffrey .A. Mello, (2002). Strategic Human Resource Management, Thompson Learning, U.S.A.

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- 1.<https://youtu.be/KXxheTQXyDw>
- 2.<https://www.youtube.com/watch?v=qWv570bxjdU>
- 3.<https://youmatter.world/en/definition/green-human-resources-management-meaning-definition/>
- 4.<https://www.youtube.com/watch?v=CLr-xaQEnkE>

Pedagogy: Chalk& Talk , Seminar, PPT Presentation, Group Discussion and Case Study.

Course Designer

Ms.S.Hema

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	Category	Hours/Week	Credits
22PSW1DSE1B	MANAGEMENT OF ORGANIZATIONS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

To provide an overview of the structure and administration of an organization.

To impart necessary skills for the management of organizations.

To provide an understanding of the policies and procedures involved in establishing and maintaining non-profit organizations.

Prerequisites

Gain Knowledge on managing Organisations and Non-government organizations

Course Outcome and cognitive level mapping

CO Number	CO Statement	Cognitive level
	On the successful completion of this course, the students will be able to	
CO 1	Define and Interpret the basic concepts of organisation and non-Governmental organisation	K1, K2
CO 2	Apply the various functions of management and non-governmental organisations	K3,
CO3	Analyse the skills involved in governing organisations	K4
CO4	Determine the roles of social workers in managing organisations	K5
CO5	Formulate the various plans and policies to improve the functions of organisation	K6

Mapping of CO and PO and PSO

CO/PO	PSO1	PSO 2	PSO 3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	3	3	2	2	2	2
CO2	2	2	2	2	2	2	3	2	2	2
CO3	3	2	3	3	2	3	2	3	3	3
CO4	2	3	3	3	3	2	2	2	2	3
CO5	3	2	2	2	3	3	3	3	3	2

“1”-Slight (Low) correlation, “2”-Moderate (Medium) Correlation

“3”-Substantial (high) Correlation, “-”-Indicates there is no Correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Basics of Organization Organization: Concept, Elements of Organization, Organizational Objectives, Vision and Mission. Organization Structure: Concept and Advantages and Disadvantages of Organization Structure. Business Organizations: Concept and Operational Areas (Production Management, Human resource Management, Marketing Management and Advertising Management, Materials Management).</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Fundamentals of Management Management: Definition, Nature, Functions (Planning, Organizing, Staffing, Directing, Controlling, Reporting and Budgeting), Levels of Management – Top, Middle and low level. 5Ms of management (Man, Material, Machines, Money and Motion).</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Evolution of management Thought Concepts and Key Contributions – Classical Theory: Scientific Management (F.W.Taylor), Administrative Management (Henri Fayol), Bureaucratic Theory (Max Weber); Neo- Classical Theory: Human Relations Approach (Elton Mayo), Behavioural Approach (M P Follet) New Management theory: System Approach, Contingency Approach, New Management Thought - Theory Z (William Ouchi).</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Introduction to Non-Profit Organization Non-profit organization: Meaning, Objectives, Principle. History of Non-profit organizations in India. Registration of organizations as Societies, Trusts, and Non-Profit Companies. Strategic planning: Vision, Mission, Goal, Objective and activities</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Management of Non-profit Organizations Project proposal –Meaning and Project proposal Writing, Fund Raising -Meaning, Importance, principles and practices and various funding agencies in India.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	Self-study for Enrichment (Not Included for End semester examination) Managerial skills: Conceptual, Technical and Human Relation Skills. Case study and role play in Classical theory and Neo-Classical theory. Various Non-Profit Organisations in Tamilnadu. Preparing project proposal by using MS-Word and MS-Excel	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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1. Samvel.C. Certo And S. Trevis Certo,(2007). Modern Management. Prentice Hall of India Pvt Ltd.
2. P. Subba Rao, (2017) Mangament and organsiation behavior (text and cases) Himalaya publishing House Pvt Ltd.
- 3.S. P. Rajagopalan, (2008). Principles of Management,, Srivari Publication
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5. Sherlekar.S.A,Heredia R.A. et al.,(1979) “Industrial Organization and Management”, Himalaya Publishing House, Bombay.
6. Gupta C.B.,(1998) .“Organisation and Management” Sultan Chand &Sons, New Delhi.
7. Joseph L. Massie, (1973).“Essentials of Management”, Prentice Hall of India Ltd, New Delhi.
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11. Sooryamoorthy R and Gangrade K.D, (2006). NGOs in India-A cross Sectional study New Delhi: Rawat publication pvt Ltd.
12. Vetrivel Surendra ,(1999). Participation Concept, Kumar Approach and Techniques, New Delhi, Vetri Publishers
13. Prasanna chandra projects,(2002). Planning Analysis, Financing, Implementation and Review, Tata MC Graw Hill Publishing Company Ltd, New Delhi.
14. Vasant Desai Project Management,(1997). Himalaya Publishing House Mumbai.

Web References

- 1.<https://www.youtube.com/watch?v=Ie7kjAE0aBM>
- 2.<https://www.youtube.com/watch?v=TsZukmeaewc>
- 3.<https://www.youtube.com/watch?v=d1jOwD-CTLI>
- 4.<https://www.youtube.com/watch?v=EryyxLI4IK8>
- 5.<https://www.fool.com/the-blueprint/project-proposal/>

Pedagogy

Group Discussion, Case Study, E-Content and PPT

Course Designer

Ms.S.Hema

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW1DSE1C	NGO MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To facilitate the understanding towards the role of civil society organizations especially NGOs in the development of the masses.
- To justify the importance of practices and approaches in NGO Management.
- To apply the process of planning and implementation of Projects.
- To elaborate the concepts and principles of NGO management.

Prerequisites

Gain knowledge in initiating NGO and managing it.

Course Outcome and cognitive level mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember and understand the concept and history of NGOs, Project Management	K1, K2, K3, K4, K5, K6
CO2	Analyze the process of Planning and implementation of Projects	K1, K2, K3, K4, K5, K6
CO3	Evaluate the importance of skills and techniques involved in NGO Management	K1, K2, K3, K4, K5, K6
CO4	Justify the importance of practices and approaches in NGO Management	K1, K2, K3, K4, K5, K6
CO5	Formulate various strategies in the development of NGOs	K1, K2, K3, K4, K5, K6

Mapping of CO and PO and PSO

CO/PO	PSO1	PSO 2	PSO 3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	2	2	2	1	1	2	2	2	1
CO2	1	1	1	2	1	1	1	1	2	1
CO3	1	2	1	2	1	1	2	1	2	1
CO4	2	1	1	1	1	2	1	1	1	1
CO5	1	1	1	1	1	1	1	1	1	1

“1”-Slight (Low) correlation,
 ”3”-Substantial (high) Correlation,

”2”-Moderate (Medium) Correlation
 ”-“-Indicates there is no Correlatio

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Foundations of Management and NGOs: Management- Concepts, Objectives, Functions. NGOs -Concept, Types, Functions, Board of Directors – Composition, functions, and Role of NGOs in Community Development. NGO Management – Concept, Principles and Approaches.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Legal Framework for Establishing NGOs in India: Constitutional Provision with regard to Charitable Organization, Formulation and Registration of NGOs in India – Societies Registration Act, Indian Trusts Act, Indian Companies Act. Foreign Contribution Regulation Act, Statutory Obligations – Income tax exemption (80G, 12A & 35 AC).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Project Management in NGOs: Planning – Concept, Principles and Scope, Micro and Macro level planning. Projects – Concept, Types, Dimensions of Project –Identification, Need Assessment, Problem Tree, Formulation of Project Proposal and Project Appraisal, PRA tools, Monitoring and Evaluation - PERT and CPM	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Resource Mobilization: Resources – Concept & Types. Resource Mobilization – Concept, Need for Resource Mobilization, Methods and Techniques. Fund Raising and Grant Proposals – Concept, Local, Regional, State, National and International level funds, Potential donors, Strategies adopted in fund raising, Challenges encountered during fund raising, Grant Proposals – concept & framework.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	NGO Governance: Concept, Governing Structures at the National and International level, Challenges and Ethical Concerns. Good Governance: Concept, Principles and Guidelines for good governance and Accountability. Financial Management of NGOs – Concept, Record Keeping, Internal Control, Budgeting and Financial Reporting.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	<p>Self Study for Enrichment (Not included for End Semester Examination)</p> <p>Maslow Hierarchy of Needs, Deficiency Needs Vs Growth Needs, Maslow Hierarchy of Needs, Characteristics of Self Actualizers, Strengths and Weakness of NGOs.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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Text Books

- 1) Abraham, A (2011) Formulation and Management of NGOs, Universal law.
- 2) Chandra, S. (2003) Guidelines to NGO Management, Kanishka Publishing

References Books

- 1) Fisher, J. (2003) NGOs and the Political Development of the Third World, Rawat.
- 2) Jain, R.B (1991). NGOs in Development Perspective, Vivek Prakasam
- 3) Shah, I (2005). A Practical Guide to NGO and Project Management, Himalayas

Web References:

- 1) <https://www.youtube.com/watch?v=QwvCU6AJJRI>
- 2) <https://www.youtube.com/watch?v=FveLpFhQbeM>
- 3) <https://www.youtube.com/watch?v=4AeBxiIYoZs>
- 4) https://www.youtube.com/watch?v=dEwJ_E9pqLQ
- 5) https://www.youtube.com/watch?v=GIItEsM_u8Tk

Pedagogy

Lecture, Peer Discussion, Seminar, PPT, Group Discussion and Case Study.

Course Designer

Dr. T. Amirtha Mary

Semester II	Internal Marks :25	External Marks:75		
Course Code	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PSW2CC4	SOCIALWORK RESEARCH & SOCIAL STATISTICS	CORE	6	5

Course Objective

- To conduct research using research Process
- To understand the steps of doing research

Prerequisites

Basic understanding of research

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Acquire knowledge on the process of doing research	K1
CO2	Understand the steps of research and use of statistics in research	K2
CO3	Identify the sources of doing research	K3
CO4	Demonstrate on presentation of research	K4
CO5	Apply the process of research	K5,K6

Mapping of Co with PO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	2	3	3	3
CO2	3	3	2	2	2	2	2	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	2	2	2	2	2	2	2	3	3	3
CO5	3	2	2	2	2	3	3	2	3	3

“1” Slight (Low) Correlation, “2” - Moderate (Medium) Correlation, “3” –Substantial (High) Correlation

Syllabus

Unit	Content	Hours	Cos	Cognitive Level
I	Social Research: Meaning, definition, objectives, characteristics Social Work Research: Meaning and definition; Difference between social research and social work research; Scientific method: meaning, characteristics; Types of Research: pure, applied, and action research; participatory and evaluation research; Qualitative research: meaning, scope, characteristics, types- Case study, Focussed Group Discussion, difference between qualitative and quantitative research.	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

II	<p>Problem Formulation: Selection of problem: criteria and sources defining the problem; Variables: meaning; types of variables; Operationalization; Measurement: meaning, levels of measurement ; nominal ordinal, interval, and ratio; Hypothesis: meaning, sources, characteristics, functions and types; attributes of a sound hypothesis; hypothesis testing; level of significance; Type-I and Type-II errors.</p>	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
III	<p>Design and Sampling: Research design: meaning and types- exploratory, descriptive, diagnostic,experimental. Universe and sampling: meaning, principles and types of sampling; Advantages and disadvantages; Tools/instruments: Types and steps involved in tool construction; Validity and Reliability: meaning and types; Pilot study and Pre-test.</p>	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
IV	<p>Sources and Methods of data collection: Primary and Secondary Sources; Methods: Interview- meaning and types; questionnaires; observation: Meaning and definition; types of observation. Data processing; Editing, Sorting, coding, transcription. Presentation of data: tabular and graphical presentation; Report writing: content, format and types; footnotes, referencing, and bibliography; meaning and differences; methods of referencing; Plagiarism; ethics, and qualities of good researcher; preparation of research project proposal; agencies involved in social work research.</p>	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
V	<p>Social Statistics: meaning, definition, use and its limitations in Social Work Research: Measures of Central tendency: arithmetic mean, Median and Mode. Computer Applications: use and Application of Computer in social work research</p>	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
VI	<p>(Self-study for Enrichment (Not included for End Semester Examinations)) Learners will be given as assignment to select a topic and carry out the steps of research. Case study and Focused Group Discussion need to be carry out. Inventories on different dimensions can be administered. Statistical package for Social sciences - Dispersion: range, quartile deviation, standard deviation and co-efficient of variation; Tests of significance: “t” test,F- test and chi-square test; Correlation: meaning, types, and uses; Karl Pearson’s coefficient of correlation and rank correlation.</p>		CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Kothari CR (2004) *Research Methodology Methods and Techniques*, New Delhi: New Age International Publishers

References

- 1 Alan Bryman (2004) *Social Research Methods*, New Delhi:Oxford University Press.
- 2 Anderson, Jonathan, Millicent Eleanor Poole, and Berry H. Durston (1970) *Thesis and assignment writing*, Australasia: J. Wiley and Sons.
- 3 Denzin, Norman K., and Yvonna S. Lincoln (1994) *Handbook of qualitative research*, Sage Publications, Inc
- 4 Earl Babbie (1998) *Adventures in Social Research using SPSS*, New Delhi: Pine forge Press
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- 7 Kothari, Chakravanti Rajagopalachari (2004) *Research methodology: Methods and techniques*, New Age International.
- 8 Lakshmi Devi (1997) *Encyclopedia of Social Research*, New Delhi : Anmol Publications.
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- 10 Netemeyer, Richard G., William O-. Bearden, and Subhash Sharma (2003) *Scaling procedures: Issues and applications*, Sage Publications.
- 11 Ramachandran, P (1993) *Survey Research for Social Work: A Primer*, Institute for Community Organization Research.
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- 13 Schutt, Russell K (2011) *Investigating the social world: The process and practice of research*, Pine Forge Press.
- 14 Singleton Jr, Royce A., Bruce C. Straits and Margaret Miller Straits, *Approaches to social research*, Oxford University Press.
- 15 Slife, Brent D., and Richard N. Williams (1995) *What's behind the research?: Discovering hidden assumptions in the behavioral sciences*, Sage publications.

Web Resources

- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=xN+GvFnx4ockQG2FkhaD+w==>
<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=xN+GvFnx4ockQG2FkhaD+w==>
<https://www.scribbr.com/dissertation/methodology/>

Pedagogy: Chalk & Talk, Seminar, PPT Presentation, Group Discussion and Case Study.

Course Designer: Dr.S.Vidhya

Semester II	Internal Marks :25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22PSW2CC5	SOCIAL WELFARE ADMINISTRATION AND SOCIAL POLICY	CORE	6	5

Course Objectives

To equip the students with knowledge on Social Welfare Administration

To assist the learners to learn about Social Welfare agencies and Social Welfare Programme

To develop an understanding on Social Planning, Social Development, NITI Aayog

To enhance skills of learners to work effectively in Welfare Agencies

To provide necessary knowledge on Social Policy Process and problems

Prerequisite: Basic knowledge on Administrative Concepts and Weaker Sections

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Define, explain, enumerate, describe, outline Social Welfare Administration, Social Work Administration, Functions and Areas of Administration, Social Welfare Programmes and Agencies, NITI Aayog, Social Policy and Process	K1
CO2	Classify, compare, Differentiate, Distinguish, Explain Government Departments, Boards, Directorates, Roles of NGOs, Functioning of Societies, Trusts, Committees, Executives.	K2
CO3	Apply, Ascertain, Determine, Express, Illustrate, Sketch Administration on different levels, concept of Indicators of Social Development, Sources and instrument of Social Policy for the welfare of weaker sections	K3
CO4	Analyze, Characterize, Classify, Compare, Examine, Explore, Point out Policy making Processes and Structures of India, different Policies of Central and State Governments	K4
CO5	Determine, Evaluate, Explain, Summarize, Categorize, Develop, Explain, Outline the functions of NITI Ayog, Policies and Programmes for Weaker Sections, Policy Advocacy, Budget Analysis, Functions of Governmental and Non Governmental Organizations and Citizens participation	K5, K6

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	2	2	3	3	3
CO2	3	2	3	2	3	2	2	3	2	3
CO3	3	3	3	2	3	2	3	3	2	3
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation
– “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Social Welfare Administration: Meaning and definition of Social Welfare Administration and Social Work administration; Purpose, historical development. principles, functions and areas (Policy making, planning, personnel, supervision, office administration, budgeting, finance, fund raising, accounting, auditing, purchase and stock keeping, record maintenance, co-ordination, public relation, monitoring and evaluation, research, annual report); Social Welfare Administration at National, State and local levels; CSWB (Central Social Welfare Board), State Social Welfare Board, Directorate of Social Welfare and Department of Empowerment of Persons with Disabilities, Functions of DDRO	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Social Welfare Programme and Agencies: Evaluation of Social Welfare in India; Voluntary Social Work, Social Agencies: Meaning, definition, type and models of NGOs; Roles of NGOs in National Development. Governmental Schemes on Social Welfare. Concept of Grant in Aid, Agency registration: Methods, advantages, preparation of byelaws, memorandum of association, rules, regulation and registration procedures; Registration of Societies and Trusts: Governing Board, committees. Executives: Roles and Functions	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Social Planning and Social Development: Social planning and community planning, Need and importance. Concept and indicators for social change and social development in India NITI (National Institute For Transforming India) Aayog : Introduction, Structure, Aims and Objectives, Features, Functions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

IV	<p>Social Policy: Definition, need, evolution and constitutional base; Sources and instrument of social policy, policies regarding other backward castes (OBCs), Scheduled Castes (SCs), Scheduled Tribes (STs) and Denotified Communities. Policies and programmes for women, Children, Youth, Senior Citizens and Disabled, Central and State Governments programme for weaker sections.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Social Policy Process and Problems: Policy making processes and structures in India, Policy advocacy: Analysis and budget analysis, The role of Executive, Legislature and judiciary, Policy implementation: The role of Governmental agencies - the participation of non-governmental organizations and citizens participation- Problems in implementation of policy-Analysis of different policies of the Central and State Governments and changing nature of social policy in India.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-study for Enrichment (Not to be included for End Semester Examinations) Learners need to carry out a thorough study on Programmes of a Non-Governmental Organization and Administrative functions, Highlighting the unique features of Non-Governmental Organization in Administering Welfare Programmes with effective people participation.</p>	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

Text Book:

D.R. Sachdeva. (1992) *Social Welfare Administration in India*. Kitab Mahal Publications

REFERENCE BOOKS

Web References

- <http://www.igntu.ac.in/eContent/IGNTU-eContent-642461769227-MSW-2-DrRameshB-SocialWelfareAdministrationandSocialLegislations-1,2,3,4,5.pdf>
<https://guide2socialwork.com/social-policy-in-india/#:~:text=The%20broad%20areas%20of%20social,relevant%20source%20of%20social%20policy.>
https://sirdodisha.nic.in/download/Social_Welfare_Schemes_Reference_English.pdf
<https://www.niti.gov.in/objectives-and-features>

Pedagogy: Lectures, Group discussion, PPT presentation, Case study and Students led seminars.

Course Designer: Dr.G.Kanaga

SEMESTER II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW2CC2P	SOCIAL WORK PRACTICUM	CORE	6	5

Course objective

To provide opportunities to the students for applying the knowledge and the information gained in the class room to reality situations.

Perquisites

Basic understanding of fields of Social Work

Course outcome and Cognitive Level Mapping

On successful completion of this course, Student will be able to

Course Outcomes		
CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	Understanding both the agency and the client as systems	K2
CO2	Develop knowledge of administrative procedures, programme management and utilizing the skills in practice	K3
CO3	Analyse the skills of problem solving process and practice	K4
CO4	Interpret the different social issues and social welfare agencies	K5
CO5	Modify Solutions Based on need of the Client	K6

Mapping of CO with PSO and PO

Cos	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	2	3	3	3	3	2
CO2	2	3	2	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	2
CO4	3	2	2	2	2	3	3	2	2	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

1. Concurrent field work - agency placement in generic setting of practice such as schools/old age homes/counselling centres/rehabilitation settings etc. to initiate and participate indirect delivery
2. The placement will be for a minimum duration of 30 Field Work days for 2 days per week/semester and report to be submitted during faculty and Student Individual conference.
3. Importance to be given for the practice of Social Work methods. Each student is expected to conduct case work with a minimum of 3 clients, group work with at least 2 groups, and organise one community based programme.

Method of Assessment

Internal - 40 marks

S.NO	INTERNAL	MARKS
1	Case Work Practice	10
2	Group Work	10
3	Community Programme	10
4	Reporting	5
5	Attendance for Field Work	5
Total		40

External – 60 Marks

S.NO	EXTERNAL	MARKS
1	Theoretical Knowledge	20
2	Agency Evaluation	20
3	Mobilizing Resources	10
4	Communication and Presentation	10
Total		60

Pedagogy: Observation, Case Study and Field Visits

Course Designer:Ms.S.Hema

Semester II	Internal Marks:25 External Marks:75			
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PSW2CCC1A	COUNSELLING: THEORY AND PRACTICE	CORE CHOICE COURSE	6	4

Course Objectives

1. To understand the concept of Counselling
2. To know the skills of counselling and understand the approaches in various settings

Prerequisites

Basic understanding of Counselling & its need

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Demonstrate the concepts & Principles of Counselling	K1,K2
CO2	Identify the process & Approaches to Counselling	K3
CO3	Examine the types & Techniques of counselling	K4
CO4	Explain the Components of effective counselling	K5
CO5	Elaborate on various problems of clients in different settings	K6

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	3	3	3	3	3
CO2	3	2	3	2	3	3	2	3	2	3
CO3	3	2	3	2	3	3	3	2	2	3
CO4	3	2	3	2	3	3	3	2	3	2
CO5	2	2	2	3	2	3	3	2	2	3

“1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Counselling: Meaning, Definition, Need and importance of counselling and professional counselling. Basic principles of counselling: participation, Individualization, confidentiality, communication, acceptance, self-confidence, self-awareness, and other principles governing the counselling relationship. Professional Ethics in Counselling, Counselling as a helping Relationship	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5,K6
II	Theories of Counselling: Psychoanalytic, Adlerian, Client Centered, Behavioural approach, Rational Emotive, Reality, Gestalt, Transactional Analysis, Cognitive Behavioural Therapy, and Eclectic theories.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
III	Counselling process & Approaches: Interview and its significance in counselling – use of observation in counselling and understanding of emotions in counselling. Directive Approach, Non Directive Approach & Eclectic Approach	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
IV	Types of Counselling: Individual and group counselling, family counselling, marital counselling, student counselling, and industrial counselling. Techniques of group counselling, strategies and structure – barriers to effective counselling sessions; counselling evaluation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6

V	Components of effective Counselling : Counsellor's skills – Role and functions of the counsellors in schools, industries, family, hospital, old age homes and rehabilitation institution.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Skill enrichment (Not to be included for External Examination) Application of Counselling Principles in the field, Case study presentation from field Work Experience, Application of test standardized tests in counselling settings: Personality, intelligence, interpersonal relations, stress, anger, self esteem, anxiety, assertiveness, depression, adjustment, and mental health.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text books:

- 1) Rao, S.Narayana (2015). Counselling and Guidance, McGrawhill.
- 2) Zastrow, Charles (2009) Counselling Psychology, Wiley

Reference Books

- 1) Chennai Counsellors Foundation (2017). Counselling Approaches: A Practitioner's guide, Notion Press.
- 2) Corey, G. (2013). Theory and Practice of Counselling and Psychotherapy, Wadsworth
- 3) Loughran, H. (2018). Counselling Skills for Social Workers, Routledge.
- 4) McLeod, J. (2013) An introduction to counselling. Mc Graw-Hill Education.
- 5) Noonan, E. (2002). Counselling young People. Routledge.
- 6) Soundarajan, R. (2017). Counselling: Theory, Skills and Practice, Mc Grawhill
- 7) David Murphy, John Wiley & Sons, (2017), Counselling Psychology, The British Psychological Society.

Website References

- 1) <https://counseling.northwestern.edu/blog/five-counseling-theories-and-approaches/>
- 2) <https://myshrink.com/list-of-counseling-theories/>
- 3) <https://positivepsychology.com/counseling-process>

Pedagogy

Lectures, Audios / Videos followed by discussion, PPT, Case Studies, Group Discussion, Peer Learning and Student-led seminars.

Course Designer: Ms.PL.Rani

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PSW2CCC1B	PSYCHOLOGY FOR SOCIAL WORKERS	CORE CHOICE COURSE	6	4

Course Objective

To make students familiar with basic psychological concepts, processes and its scope particularly relevant to social work practice.

Prerequisites

Basic understanding on psychology

Course Outcome and Cognitive Level Mapping

On successful completion of this course, Student will be able to

CO number	CO statement	Cognitive level
CO1	Define, recall, explain, demonstrate and outline the Psychology: Definition, Nature and Scope, introduction to schools of Psychology; Concept of human behaviour, Normality and Abnormality, Psychosis and Psycho-neurosis ,Importance of Psychology in Social Work practice.	K1,K2
CO2	Analyse, categorize, compare, list, distinguish and examine about Personality: definition and structure., Theories of Personality: Sigmund Freud, Carl Jung, Alfred Adler, Caren Harney, Sullivan, Otto Rank, Cattell, Eric H. Erikson and Maslow	K4
CO3	Define, Recall, explain, demonstrate outline ,classify and compare Human growth and development: Concept, Nature and Importance, stages of development: pregnancy and child birth- infancy – babyhood-childhood-adolescent – adulthood – middle age – old age.	K1,K2
CO4	Identify, apply justify and evaluate the concept of Attitudes: Concept and Nature, stereotypes and prejudice, Formation of Attitudes and Attitudes change in individuals and groups., Emotions, Intelligence ,Measurement of intelligence. Psychological testing: personality and intelligence tests.	K3,K5
CO5	Elaborate and discuss about Learning: Nature, definition and types, Theories of Learning : theories of Pavlov and Skinner; remembering and forgetting., Motivation: Concept and Nature, Types of motives: Biological motives and Psycho social motives .Coping mechanisms: nature and types., mental health	K6

Mapping of CO with PO and PSO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	3	3	3	3	3	2	2	2	2	2
CO3	3	2	2	3	3	3	3	3	3	3
CO4	2	3	2	2	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation
 “3” – Substantial (High)Correlation – “-” indicates there is no correlation.□

Syllabus

Unit	Content	Hours	COs	Cognitive Level
I	Basic Concepts Psychology: Definition, Nature and Scope, introduction to schools of Psychology; Concept of human behaviour, Normality and Abnormality, Psychosis and Psycho-neurosis ,Importance of Psychology in Social Work practice.	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
II	Development Stages Human growth and development: Concept, Nature and Importance, stages of development: pregnancy and child birth- infancy – babyhood- childhood-adolescent – adulthood – middle age – old age.	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
III	Learning, Motivation and Coping mechanisms Learning: Nature, definition and types, Theories of Learning : theories of Pavlov and Skinner; remembering and forgetting., Motivation: Concept and Nature, Types of motives: Biological motives and Psycho social motives .Coping mechanisms: nature and types., mental health	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
IV	Personality and Theories of Personality Personality: definition and structure., Theories of Personality: Sigmund Freud, Carl Jung, Alfred Adler, Caren Harney, Sullivan, Otto Rank, Cattell,Eric H. Erikson and Maslow	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

V	<p>Attitudes, Emotions and Psychological testing</p> <p>Attitudes: Concept and Nature, stereotypes and prejudice, Formation of Attitudes and Attitudes change in individuals and groups., Emotions, Intelligence ,Measurement of intelligence.</p> <p>Psychological testing: personality and intelligence tests.</p>	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
VI	<p>Self-study for Enrichment(Not included for End Semester Examinations)</p> <p>Learners should prepare an assignment on psychological test and their effectiveness in psychiatric treatment, Students should have a group discussion on Socialization process and the agents of socialization. Group discussion on basic overview regarding Relevance of Psychology to Social Work: Multidimensional Perspective- Biophysical(changes)-Psychological – Social(Support systems)–Person-in Environment (PIE)</p>		CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

Text Book

Hurlock.E(2017) Developmental Psychology: A Life - Span Approach(Vth Edition), Europe:Tata Mcgraw Hill.

Reference Books

- Bernard, L.L.(1927).*An introduction to social psychology*. George Allen & Unwin,
- Dacey.J.,Travers.J., Fiore.L.(1996).*Human Development: Across the Lifespan*,McGraw Hill. Davidoff,
- Feldman, R.S.(1990).*Understanding Psychology*, McGraw Hill Publishing Company.
- Norlin, J., Chess. W., Dale, O., Smith, R.(2003).*Human Behavior and the Social Environment: Social Systems Theory (4th Ed)*. Boston: Allyn Bacon.
- Saraswati, T. S., Dutta..R.,Sikka.A.(1987).*Developmental psychology in India*, New Delhi ; Newbury Park :Sage Publications.
- Weiner, E.A., Stewart, B.J.(1984).*Assessing Individuals: Psychological and Educational Tests and Measurements*,Boston, Little, Brown andCo.
- Ashford, Lecroy& Jose: *Human behaviour in Social Environment*, Belmont CA: Wadsworth Publishing Co Inc
- Baron, Robert : *Psychology: An Introduction*,New Delhi: Pearson Education India

Web references

1. <https://ncert.nic.in/ncerts/l/kepy109.pdf>
2. ARC Resource Pack Study Material Foundation Module 7 ,Psychosocial Support (<http://hvwww.arc-online.org>)
3. https://profilelogin.admissiononline.com/UploadFiles/Documents/ProfileLogin/Subtitle/NColge_1372_Theories%20of%20Personality.pdf
4. Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist*, 55(1), 34–43. <https://doi.org/10.1037/0003-066X.55.1.34>
5. Newman, L.V.(2000).The expatriate adjustment process: implications of the cross- cultural context on learning the environment following a work-role transition. Diss. University of Illinoisat Urbana-Champaign.
6. Satterfield JM. Happiness, excellence, and optimal human functioning: Review of a special issue of the *American Psychologist* (2000;55:5-183), Martin E P Seligman and Mihaly Csikszentmihalyi, guest editors. *West J Med.* 2001 Jan;174(1):26-9. doi: 10.1136/ewjm.174.1.26. PMID: 11154661; PMCID: PMC1071226.

Pedagogy: Chalk& Talk, , Seminar, Power point presentation, Group Discussion and Case Study.

Course Designer: Dr.O.Aisha Manju

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PSW2CCC1C	YOUTH AND MARGINALIZED SECTIONS	CORE CHOICE COURSE	6	4

Course Objective

To introduce students to the basic concept of youth and marginalized

Prerequisites

Basic understanding on youth and marginalisation.

Course outcome and Cognitive Level Mapping

COs	CO STATEMENT	COGNITIVE LEVEL
	On the successful completion of this course,the students will be able to	
CO1	Define, Recall, explain, demonstrate, Illustrate and outline the concept of Youth: Youth as age category, as transitional stage, as social construct.demographic profile of Indian youth, characteristics of youth,social movements,youth unrest., Problems of youth : Marginalization, high risk behaviour., life style related issues : food habits, diseases, confidence building, Teenage pregnancy, smoking, addiction.	K1,K2
CO2	Define, recall, explain, demonstrate, illustrate ,classify the Conceptual understanding of Marginalization–Meaning, definition, patterns and types of marginalization., Sources and dimensions of Marginalization	K1,K2
CO3	Apply, Ascertain, Determine, Express, Illustrate and sketch the youth in New Millennium: Challenges and Opportunities: Impact of westernization, modernization, urbanization and globalization., Education and Skill Development, Employability and Employment ., Health: Physical, Mental and spiritual well-being.,Youth & media influence.	K3
CO4	Analyze, characterize, classify, compare, examine,explore and Point out Youth Welfare: Policies and programs for youth, Youth Policy–2014; Voluntary organizations for youth development and welfare, constitutional safe guards for youth.	K4
CO5	Determine, evaluate, explain, summarize, categorize,develop, Elaborate ,discuss and outline the Marginalized Categories-Understanding the special needs of marginalized categories: Scheduled Caste, Scheduled Tribes, Differently abled, LGBT, Minorities, Women, children,Aged, Migrants, Street dwellers, people living in slums, people living with HIV/AIDS and addicts.	K5,K6

Mapping of CO with PO and PSO

CO/PO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	2	2	2	3	2	3	3
CO2	3	3	3	3	2	3	3	3	3	2
CO3	1	2	2	2	2	2	2	2	2	2
CO4	3	2	3	2	3	3	2	3	2	2
CO5	3	2	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation □ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation. □

Syllabus

Unit	Content	Hours	Cos	Cognitive Level
I	Concept of Youth: Youth as age category, as transitional stage, as social Construct. Demographic profile of Indian youth, characteristics of youth, social movements, youth unrest., Problems of youth : Marginalization, high risk behaviour., life style related issues : food habits, diseases, confidence building, Teenage pregnancy, smoking, addiction.	15	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
II	Youth Welfare: Policies and programmes for youth, Youth Policy–2014; Voluntary organizations for youth development and welfare, constitutional safe guards for youth.	15	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
III	Youth in New Millennium: Challenges And Opportunities: Impact of westernization, modernization, urbanization and globalization., Education and Skill Development, Employability and Employment ., Health: Physical, Mental and spiritual well-being., Youth & media influence.	15	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
IV	Conceptual understanding of Marginalization – Meaning, definition, patterns and types of marginalization., Sources and dimensions of Marginalization.	15	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
V	Marginalized Categories- Understanding the special needs of marginalized categories: Scheduled Caste, Scheduled Tribes, Differently abled, LGBT, Minorities, Women, children, Aged, Migrants, Street dwellers, people living in slums, people living with HIV/AIDS and addicts.	15	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
VI	Self study for Enrichment(Not included for End Semester Examinations) Learners will have group discussion on Community Health Education on Water, Sanitation and waste management.		CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

Text Book

Ahuja Ram. 1992. Social problems in India. New Delhi: Rawat publications

Rajendra. J, 1992, Modernisation of youth in India, New Delhi: Rawat Publications Pvt. Ltd

Reference Books

- Amala Jeyarayan A (2014), Empowerment of Marginalized Youth, Abhijeet Publication, New Delhi
- Beteille, Andre (1992): *The Backward Classes in Contemporary India*, Delhi: Oxford University Press.
- Charsley, S. R and G.K. Karanth (1998); *Challenging Untouchability* ,Delhi: Sage
- Chaudhuri, S.N (1988): *Changing Status of Depressed Castes in Contemporary India* ,Delhi: Daya Publishing House.
- Chatterjee, C and Sheoran, G. (2007). *Vulnerable groups in India*. The Centre for Enquiry into Health and Allied Themes (CEHAT), Mumbai.
- Coles ,B.(2002). *Youth and Social Policy*. London: Routledge.
- Grusky, David, (2001) *Social Stratification: Race, Class, and Gender in Sociological Perspective*. Colorado: Westview Press.
- Jeyarayan,A .(2014). *Empowerment of Marginalized Youth*, New Delhi: Abhijeet Publication.
- Kasi Eswarappa;Ziyauddin K.M (Ed). *Dimensions of Social Exclusion: Ethnographic Explorations*. Cambridge Scholars Publishing, 2009
- Kehily Jane Mary (Etd.) (2007), *Understanding Youth: Perspectives, Identities and Practices*, London: Sage Publication.
- Mary,K.J. (Etd.) (2007). *Understanding Youth: Perspectives, Identities and Practices*. London : Sage Publication.
- Paul,L.H.(2011). *Adolescence and Youth: The Process of Maturing*. New Delhi: Sarup Book Publishers Pvt. Ltd.
- Saraswati ,S.(2008). *Indian Youth in New Millennium*. RGNIYD, Sriperumbudur
- Udaya Mahadevan, Rozario, Gireesan, and Rambabu (2015), *Youth Development: Emerging Perspectives*, New Delhi: Shipra Publications.

Journal

- Young Journal on Youth published by SAGE: <http://you.sagepub.com>

Web Resources

- [Youth and Their Concerns – eGyanKosh, https://egyankosh.ac.in/bitstream/123456789/75498/1/Unit-5.pdf](https://egyankosh.ac.in/bitstream/123456789/75498/1/Unit-5.pdf)
- Welfare Schemes and programmes of Government of India https://epgp.inflibnet.ac.in/epgpdata/uploads/epgp_content/social_work_education/social_welfare_&_development_administration/03_welfare_schemes_and_programmes_of_government_of_india/et/6065_et_et.pdf
- Youth And the Millennium Development Goals: Challenges and Opportunities for Implementation [,https://www.un.org/esa/socdev/social/papers/YouthandMDGs.pdf](https://www.un.org/esa/socdev/social/papers/YouthandMDGs.pdf)
- Types of Marginalization <https://old.amu.ac.in/emp/studym/100016070.pdf>
- Hilker, Lyndsay McLean and Fraser, Erika (2009) Youth exclusion, violence, conflict and fragile states, DFID . <http://www.gsdr.org/docs/open/con66.pdf>
- <https://yas.nic.in/sites/default/files/e-book-english2016.pdf>

Pedagogy: Chalk& Talk, , Seminar, PPT Presentation, Group Discussion and Case Study.

Course Designer: Dr.O.Aisha Manju

Semester II	Internal Marks :25	External Marks : 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22PSW2DSE2A	FAMILY SOCIAL WORK	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

1. To make the learners to understand basic concepts of family, marriage, social work intervention techniques, Reproductive and Child Health
2. To help the learners to analyse the factors contributing to changes in social Institutions.
3. To enable the learners to find the theoretical base of families
4. To strengthen the professional competence of Social work Practice with families
5. To make the learners to become aware of the government and NGOs initiatives for family welfare.

Pre-requisites

The learners needs to possess basic knowledge about the social institutions like family and marriage.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	COGNITIVE LEVEL
CO1	Define, Recall, explain, demonstrate, Illustrate and outline Family, characteristics, types and functions of family, marriage, forms and functions of Marriage, separation, divorce, family life education, needs assessment, goal setting, family crisis, Family Therapy; Marital Counselling; Pre-marital Counselling; Eclectic Approach, Reproductive and Child Health	K1, K2
CO2	Identify and apply Family as a social institution, emerging family patterns, changing situations in marriage, separation and divorce, family life education, Intervention Methods in Social Work, Family Welfare Programmes, Reproductive and Child Health Programme.	K3
CO3	Analyse, categorize, compare, list, Distinguish and examine emerging family patterns, changing situations in marriage, challenges, equity and equality in family functions and relationships, separation and divorce, special needs, Social Work with Individuals in Family Setting; Social Work with Groups in Family System; Working with the Community for Family System and Family Welfare Programmes.	K4
CO4	Evaluate, justify and recommend Family as a social institution, emerging family patterns, changing situations in marriage, challenges, equity and equality in family functions and relationships, theories in understanding family, legislations on family and marriage, Intervention Methods in Social Work and Role and contributions of NGOs in Family development.	K5
CO5	Elaborate and discuss understanding the family, emerging family patterns, changing situations in marriage, challenges in Marriage and Family, theories in understanding family, legislations on family and marriage, Crisis Intervention; Family Therapy; Marital Counselling; Pre-marital Counselling; Eclectic Approach, Ministry of Health and Family Welfare, Family Welfare Programmes, Role and contributions of NGOs	K6

Mapping of CO with PSO and PO

COs	PS01	PS02	PS03	PS04	PS05	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”- Slight (Low) Correlation –“2” – Moderate (Medium) Correlation - “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Family in Society: Family as a social institution, concept, characteristics, types, functions, understanding the family, emerging family patterns; Dynamics of Family System.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
II	Marriage: Concept and definition of marriage, forms, functions, changing situations in marriage, challenges, equity and equality in family functions and relationships, separation and divorce, family life education.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
III	Theoretical frameworks and laws: Theories in understanding family, Multiplicity of Family Problems; Problems of children, parents and problems between husband and wife; Families in Crisis.; Assessment of family needs: problem assessment and goal setting, legislations on family and marriage	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
IV	Social Work with Family: Intervention Methods in Social Work: Social Work with Individuals in Family Setting; Social Work with Groups in Family System; Working with the Community for Family System; Crisis Intervention; Family Therapy; Marital Counselling; Pre-marital Counselling; Eclectic Approach.	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
V	Role of Government and NGOs: Ministry of Health and Family Welfare: Family Welfare Programmes: Reproductive and Child Health Programme: Maternal Health; Child Health; Involvement Of NGOs in the Family Welfare Programme; Rural and Urban Family Welfare Infrastructure	18	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6

VI	Self-study for Enrichment (Not to be included for End Semester Examinations) Visiting ten families and identifying at least two families for detailed family analysis. Prepare an e-content on the role of family social workers in Indian context.	-	CO1, CO2, CO3, CO4, CO5, CO6	K1, K2, K3, K4, K5, K6
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Text Book:

Munson C.E. (1985), Social Work with Families: Theory and Practice, London Free Press

Reference Books

- Carter, B. McGoldricke. M.(1989). The Changing Family Life Cycle-A Framework for Family Therapy, London: Allyn & Bacon.
- Christine.C. (2011). Advanced Social Work with Children and Families, New Delhi: Learning Matters.
- Constable, R& Lee,D.B. (2004). Social Work with Families: Content and Process, Chicago, USA: Lyceum Books Inc
- Desai, M. (ed), (1994). Family& Interventions- Course Compendium, Mumbai: TISS.
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- Linda.M. (2012). Understanding Families, London: Sage.
- Margaret, A., Schvaneveldt. M.J. (1993). Handbook of Family Life Education- The Practice of Family Life Education, New Delhi: Sage.
- Pat, S. (2000). Families and Social Workers: the work of Family Service Units, Great Britain: Liverpool University Press
- William G.J. (1965). The Family, New Delhi: Prentice Hall.

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- <https://ncert.nic.in/textbook/pdf/kehe102.pdf>
- <https://egyankosh.ac.in/bitstream/123456789/17331/1/Unit-16.pdf>
- [https://socialsci.libretexts.org/Bookshelves/Early_Childhood_Education/Book%3A_Child_Family_and_Community_\(Laff_and_Ruiz\)/01%3A_Theories_That_Help_Us_Understand_Families/1.01%3A_Theories_Developed_for_Understanding_the_Family_family_socialwork.pdf](https://socialsci.libretexts.org/Bookshelves/Early_Childhood_Education/Book%3A_Child_Family_and_Community_(Laff_and_Ruiz)/01%3A_Theories_That_Help_Us_Understand_Families/1.01%3A_Theories_Developed_for_Understanding_the_Family_family_socialwork.pdf)
- <https://nhm.gov.in/WriteReadData/1892s/40128948991551078536.pdf>

Pedagogy: Lectures, Audios / Videos followed by discussion, PPT, and Student-led seminars.
 Course Designer: Dr.G.Mettilda Buvaneswari

SEMESTER II	Internal Marks :25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/Week	Credit
22PSW2DSE2B	DISASTER MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

To orient students about Disaster Prevention, Preparedness, Education, and Capacity building.

Prerequisites

Basic understanding of Disasters

Course Outcome and Cognitive Level mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	COGNITIVE LEVEL
CO1.	Identify the Basic Concepts of Disaster and Disaster Management	K1,K2
CO2.	Summarize the Government role in Disaster Management	K3
CO3.	Discover the problems of disaster survivors	K4
CO4.	Apply the techniques of disaster Management	K5
CO5	Evaluate the teamwork involved in disaster management	K6

Mapping of Co with PO

CO/PO	PS O1	PS O2	PS O3	PS O4	PS O5	PO 1	PO 2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	2	3	3	3
CO2	3	3	2	2	2	2	2	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	2	2	2	2	2	2	2	3	3	3
CO5	3	2	2	2	2	3	3	2	3	3

“1” Sight (Low) Correlation, “2”- Moderate (Medium) Correlation, “3” –Substantial (High) Correlation

Syllabus

Unit	Content	Hours	Cos	Cognitive Level
I	Disaster & Types: Disaster: definition, dimensions of disaster, progress in vulnerability. Types of disaster: Natural and Manmade, Natural : <i>Water and climate related:</i> Floods and drainage management, droughts, cyclones, tsunami, tornadoes, hurricane, snow avalanches, heat and cold waves. <i>Geological related:</i> Earthquakes, landslides, mudflows, dam bursts. Industrial accidents, biological disasters	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
II	Phases- (rescue, relief, rehabilitation, rebuilding). Rescue, relief phase: Need assessment, rescue and relief provisions by Army, Police, Fire	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

	services, Panchayat Raj institutions. Psychological first aid for disaster survivors.			
III	Crisis management: government response system in disasters, NIDM – central, state, district, BIRMS – Basic Initial Response Management Steps. Communication systems during disasters: HAM (help all mankind) radio promotions, police wireless network, SMS, mobile services, satellite communications; warning systems in disasters.	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
IV	Impact of disaster: Impact : Physical, social, economic, and psychological impact of disasters. Psycho social care to the disaster survivors; principles of psychosocial care; techniques of providing psychosocial care Compensation: Compensation and legal issues among the disaster survivors. Housing Support. Housing and materialistic support for the disaster survivors. Town planning after a major disaster.	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
V	Capacity building by government and non-governmental organizations, disaster resilience role of social workers in disaster services. role of central and state government in disaster management services. National health policy on disaster management, disaster survivors and human rights	18	CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6
VI	(Self-study for Enrichment (Not included for End Semester Examinations)) Learners need to prepare assignment on events of Disasters. Students need to attend Seminars and workshops related to disasters.		CO1,CO2,CO3, CO4,CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Sulphey M M (2016) Disaster Management, New Delhi: PHI Learning Private Limited

REFERENCES

1. Basu, Amit Ranjan, and R. Srinivasa Murthy. 2003 "Disaster and Mental Health: Revisiting Bhopal." *Economic and Political Weekly*).
2. Dave, A.S., Sekar, K., Bhadra, S., Rajashekar, GP, Kishore Kumar, K., Srinivasa Murthy, R. 2002 Riots: Psychosocial care for Individuals. Books for Change, Bangalore. In English and Gujarati.
3. Dave, A.S., Sekar, K., Bhadra, S., Rajashekar, GP, Kishore Kumar, K., Beena, P. Srinivasa Murthy, R. 2002 Riots: Psychosocial care for children surviving the riots. Books for Change, Bangalore.
4. Desai. N.G., Gupta, D.K., Joshi, P.C., Singh, R.A., Singh, T.B., Lal, M. and Kumar, A. 2002 Mental health aspects of the earthquake in Gujarat. Indian Council of Medical Research, New Delhi.
5. Grace, H, Sekar, K., Subhasis, B., 2005 Bharat, S. Tsunami – Psychosocial care for women. NIMHANS, Bangalore.
6. Kishorekumar, K.V. Chandra Sekar, C.R. Choudhury, P.C. Parthasarathy, R. Girimaji, S. Sekar, K. & Srinivasa Murthy, R 2000 Psychosocial care for community level helpers, Bangalore.
7. Maharashtra Institute of Mental Health. 1994. Proceedings of Symposium on the Health Consequences of the Marathwada Earthquake Disaster, Pune: Maharashtra Institute of Mental Health.
8. Nadkarni, V.V. (1991) Developing curriculum in the area of Disaster Management. In S. Bharat and M. Desai (Eds) Research on Families with Problems in India: Issues and implications (Volume I),

Bombay: Tata Institute of Social Sciences.

9.Narayana R.L., Srinivasa Murthy,R., Daz P (2003) Disaster mental health in India: Monograph. American Red Cross. Indian Red Cross, New Delhi

10.National Institute of Mental Health and Neurosciences 1997 Report on National workshop on Psychosocial consequences of disasters, Bangalore.

11.Nrayana, R., Dave,A.S., Sekar,K., Kishore Kumar,K., Srinivasa Murthy,R. 2002 Riots: Psychosocial care for Women surviving the Riots. Books for Change, Bangalore.

Web Resources

<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=xN+GvFnx4ockQG2FkhaD+w==>

<https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=xN+GvFnx4ockQG2FkhaD+w==>

https://www.youtube.com/watch?v=9WIwlljva_s

Pedagogy: Chalk& Talk, , Seminar, PPT Presentation, Group Discussion and Case Study.

Course Designer: Dr.S.Vidhya

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
20PSW2DSE2C	HEALTH AND HYGIENE	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- 1.To make the students aware of Nutrition, Balanced diet & Health
- 2.To understand legislation,health policies & Programmes
- 3.To know about hygiene & its type

Prerequisite

Basic Understanding of health & hygiene

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of this course, the students will able to	
CO1	Define, Recall, explain, demonstrate and outline, health ,public health,social & preventive Medicines,Vital health	K1, K2
CO2	Identify and apply the models of community Health,PHC Programmes, Insurance Schemes	K3
CO3	Analyse, categorize, compare, list, legislation & health Care services	K4
CO4	Explain the health programmes & agencies working globally for health.	K5
CO5	Elaborate and Discuss hygiene,types & movement for hygiene	K6

Mapping of Co with PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3	3	3	3	2	3
CO2	3	2	3	2	3	3	2	3	2	3
CO3	3	2	2	2	3	3	3	2	2	3
CO4	3	2	2	2	3	3	3	2	3	2
CO5	2	2	2	3	2	3	3	2	2	3

1”- Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Health: Health, Primary Health Care and Public Health; Concepts and definition, factors influencing health; Social and Preventive Medicine, Levels of disease prevention, comprehensive health indicators–vital health statistics; Common health problems in India. Nutrition and Health: Nutrition, Balanced diet, Malnutrition, Prevention of Malnutrition Deficiency diseases, prevention of Nutritional problems.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5,K6
II	Community Health: meaning, vulnerability assessment, emergency, planning, training and education;models of community health PHC's- meaning, functions and Programmes. ChiefMinister's Comprehensive health insurance scheme in Tamil Nadu salient features; 108 Emergency ambulance services	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6
III	Legislations & Health care services - Health care delivery system at the National and State level,. Salient features of legislations related to health: MTP ACT (Amendment), Mental Health Act , Factories Act 1948, ESI Act 1948; Allocation for Health care in Five Year Plan; Health Policies in india	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,K6

IV	<p>Health Programmes & Global Health Promoting Agencies: National Mental Health Programme, National Tuberculosis Programme (NTP), National AIDS Control Programme (NACP), National Malaria Control Programme (NMCP), Universal Immunization programme (UIP), National Cancer Control Programme (NCCP), National Health Mission (NHM), Reproductive and Child Health Programme, National Family Welfare Programme. WHO, UNICEF, FAO, UNFPA, ILO.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Hygiene: Personal, food and Environmental hygiene; Relationship between health and hygiene; Environmental pollution; Living conditions: housing, sanitation, waste disposal and their influence on Health. Hygiene movements: Mental Hygiene Movement, Social Hygiene Movement, Natural Hygiene Movement.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self Study for Enrichment(Not for Examination) Health Survey in a village Analysis & Report of the Survey Documentation Plan a programme based on the findings</p>		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Textbooks

1. Park, K. (2015). Essentials of Community Health Nursing. Jaypee Brothers Medical Publication.
2. Park J.R & Park K. (2009). Text book of preventive and social medicine. Jabalpur, M/S

Banashidass publication

References

- Bajpai, P. K. (Ed). (1997). Social Work Perspective on Health. Rawat Publications.
- Broskowshi A., Marks E. & Budman S.H (1981). Linking health and mental health. Sage Publications
- Goel S.L. (1984). Public Health Administration. Sterling Publications
- Kamalam, S. (2016). Essentials in Community Health Nursing Practice. Jaypee Publication.
- Kumar, Ram. (1992). Social and preventive health administration. APH Publications.
- Pati R.L. (1992). Health Environment and development. Ashish Publications.
- Pritam Lily, Ram Telu. (1993). Environmental health and Hygiene. Vikhas Publication

Website References

1. https://www.nhp.gov.in/health-policies_pg
2. <https://www.indhospitalsolution.com/healthcare-policies-in-india>
3. <https://www.medicalnewstoday.com/articles/personal-hygiene>

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion and Case Study

Course Designer : Ms. PL. Rani

SEMESTER -II	EXTERNAL MARKS:100			
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDIT
22PSW2INT	INTERNSHIP	INTERNSHIP	-	2

Course Objectives

- 1.To integrate practice skills and techniques learnt in students.
- 2.To help students to acquire skills of systematic observation
- 3.To develop a spirit of enquiry among students.

Pre-requisites

Understanding about the theoretical concepts about community, social problems and interventions of government and non-governmental organizations.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	KNOWLEDGE LEVEL
CO1	On the successful completion of the course students will be able to Define, Understand and Experience direct practice and management operations	K1,K2
CO2	Exposure to welfare organizations and their strategies of work	K3
CO3	Demonstrate self in the role of a change agent	K4
CO4	Recommend the applications of Social Work in intervening the social problems	K5
CO5	Elaborate and discuss the strategies used in addressing the social issues	K6

Mapping of CO with PO

CO/PO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	2	3	3	3
CO2	3	3	2	2	2	2	2	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	2	2	2	2	2	2	2	3	3	3
CO5	3	2	2	2	2	3	3	2	3	3

“1” Slight (Low) Correlation, “2”- Moderate (Medium) Correlation, “3” –Substantial (High) Correlation, “-“ indicates there is no correlation.

Guidelines for the Summer Internship:

Summer internship gives an opportunity to develop linkage with reputed organizations. The objectives of summer internship is to expose students to the new learning situations and enable them to develop professional outlook and gain experience, which contribute for their professional development.

- Summer Internship comprises a time frame of 15 days at the end of first semester.
- The trainee must volunteer to locate a setting (own choice) about one month in advance and explore the possibilities of 15 days practice learning and finalize in consultation with the faculty advisors.
- The field work setting should preferably have a professionally trained social worker on the team of a staff.
- The social work trainee is to work directly with client systems and management operations of day to day work of the setting.
- Observation & Documentation, Assessment, Managing & working in teams, Implementing policies and procedures of the organizations should be the area of focus during the internship.

- Organizations for Internship could be chosen based on the trainee's inquisitiveness to work in any of the setting given below:
 - Mental health facility
 - Child protective services
 - Hospital
 - Nursing home
 - Domestic violence shelter
 - Homeless shelter
 - De Addiction centre
 - Advocacy organization
 - Local, state or national government offices
 - Environmental organizations
 - Women's centers
 - Domestic violence centers or shelter

- All expenses during the internship including travelling have to be borne by the trainee.

- The student trainee should maintain day-to-day records and a consolidated report in hard copy to the department (compulsory) and to the organization (on requirement) at the beginning of the II Semester. A MP4 file comprising of their experiences in Summer Internship have to be submitted too.

- A class presentation of their summer internship learnings should be done.

ASSESSMENT

EXTERNALS: 100 marks

Component	Marks
Attendance	15
Presentation	10
Community Outreach Programmes	10
Documentation & Reporting	30
Ability to relate theoretical concepts	10
Possession of Social Work Skills	5
Efforts made to possess Social Work skills	10
TOTAL	100

References:

1. <https://mastersinsocialworkonline.org/resources/internship-guide/>
2. <https://mssw.in/wp-content/uploads/2020/03/i-msw-syllabus-2018-20.pdf>
3. <https://uwosh.edu/socialwork/wp-content/uploads/sites/180/2020/10/MSW-Sample-Field-Syllabus.docx>

Course Designer: Dr. T. Amirtha Mary



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY - 18
(Nationally Accredited (III cycle) with 'A' Grade by NAAC
DEPARTMENT OF BUSINESS ADMINISTRATION
Minutes for the Seventh meeting of the Board of Studies on 14.10.2022

Members Present

- 1) Dr.J.Tamilselvi **Chairperson**, Associate Professor & HOD
- 2) Dr. M.Babu **University Nominee**, Bharathidasan School of Management, Bharathidasan University, Trichy.
- 3) Dr.David Rajesh **International Academic Expert**, University of Technology and Applied Sciences, Oman.
- 4) Dr. N. Thamaraiselvan **Subject Expert**, National Institute of Technology, Trichy.
- 5) Dr. R. Deepa **Subject Expert**, PSG Institute of Management, Coimbatore
- 6) Ms. Latha Swamy **Member Alumna**, Netapp, Bangalore.
- 7) Mr.P.Baskar, **Industrial Representative**, Cliff Engineering Constructor, Trichy.
- 8) Dr.S.ThamaraiSelvi **Member**
- 9) Dr.M.Neela **Member**
- 10) Dr. A.Sivaranjani **Member**
- 11) Dr.M.Gayathri **Member**
- 12) Mrs. P.Thangamani **Member**
- 13) Mrs. S. Yalini **Member**
- 14) Mrs.A.Suganya **Member**
- 15) Ms. R.V. Jeya Meenakshi **Student Representative**
- 16) Ms. R.S. Akshaya **Student Representative**

MINUTES OF SEVENTH BOS MEET - 14.10.2022:

1. RESOLUTION NO. BOS/07/01

To consider and to approve the Programme Structure (Six semesters) of **Business Administration** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

Resolved to approve the Programme Structure (Six semesters) of Business Administration for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18.

2. RESOLUTION NO. BOS/07/02

To consider and to approve the Ratification of I Semester syllabus of **Business Administration** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

Inclusion of Self Study for Enrichment Portion (Not to be included for External Examination) as Unit VI in Core Course (CC) I – Management Concepts (22UBA1CC1), Core Course (CC) II – Financial Accounting (22UBA1CC2) and Allied Course (AC) I – Managerial Economics (22UBA1AC1) of I Semester syllabus and Text book and Reference book given in the APA style format in the appropriate syllabus of **Business Administration** for 2022-2023 batch and onwards.

Resolved to approve the Ratification of I Semester syllabus of Business Administration for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18.

3. RESOLUTION NO. BOS/07/03

To consider and to approve the II Semester syllabus of **Business Administration** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

Revision of Syllabus of Core Course III (22UBA2CC3) – Elements of Marketing

➤ Topics are included in –

Unit I: Marketing Information System

Unit II: Marketing Environment

➤ Topics removed in –

Unit I: Role and functions of Marketing Manager

Unit II: Product Positioning

Unit III: Product Mix

Unit IV: Strength and Weakness of Personal selling

Unit V: Niche Marketing & Guerrilla Marketing.

Revision of Syllabus of Core Course IV (22UBA2CC4) – Business Statistics

- Topics are included in –
 - Unit I: Data Grouping
 - Unit II: Diagrammatic Representation
 - Unit III: Skewness & Kurtosis
 - Unit IV: Measures of Dispersion
- Topics removed in –
 - UNIT IV: Index number & Time series

Revision of Syllabus of Allied Course II (22UBA2AC2) – Business Environment

- Topics are included in –
 - Unit I: Environmental Analysis
 - Unit III: Role of political Environment in Business.
 - Unit IV: Business and Culture, Language, Behaviour
 - Unit V: Technological Environment
- Topics removed in –
 - Unit I: Business Ethics
 - Unit II: Economic Planning
 - Unit III: Legal Environment
 - Unit IV: Social Audit & Cultural Heritage
 - Unit V: Financial Environment

Resolved to approve the II Semester syllabus of Business Administration for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18.

4. RESOLUTION NO. BOS/07/4

To consider and to approve the Ability Enhancement Compulsory Course – III (AECC) Innovation in Entrepreneurship of **Entrepreneurial Development Cell** in II Semester for Science Stream and in III Semester for Arts Stream for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

Resolved to approve the Ability Enhancement Compulsory Course – III (AECC) Innovation in Entrepreneurship of Entrepreneurial Development Cell in II Semester for Science Stream and in III Semester for Arts Stream for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery college for Women (Autonomous), Trichy-18.

5. RESOLUTION NO. BOS/07/5

Appreciation of Board of Studies Members who contributed to prepare syllabus.

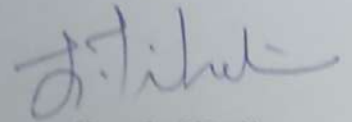
Board of Studies Members of Business Administration are profoundly appreciated the dedication and commitment of the staff members for the preparation of syllabus.

6. RESOLUTION NO. BOS/07/6

Any other matter with the permission of the Chair.

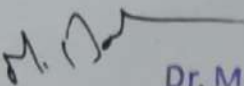
The Chairperson expressed her deep sense of gratitude and thanks to all members of Board of Studies of Business Administration.

(Chairman)



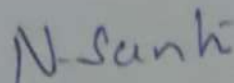
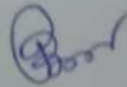
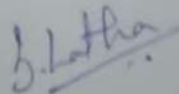
Board of Studies

Dr. J. TAMILSELVI, M.B.A., M.Phil., Ph.D., SET., NET.,
ASSOCIATE PROFESSOR & HEAD
DEPARTMENT OF BUSINESS ADMINISTRATION
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DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III cycle) with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF BUSINESS ADMINISTRATION



BBA

SYLLABUS

2022 -2023 and Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY
DEPARTMENT OF BUSINESS ADMINISTRATION**

VISION

Our vision is to provide academic excellence and developing self-reliant individuals to endow with skilled man power.

MISSION

- To promote academic excellence by adopting customized learner focused methodologies.
- To develop self-reliant and competent women by tapping and nurturing their potential through curricular and extracurricular activities.
- To provide skilled Manpower by imparting in depth knowledge and keeping abreast with changing trends in Business.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.COM., B.COM. CA, B.B.A. PROGRAMMES

PO NO.	Programme Outcome On completion of B.Com. /B.Com. CA / B.B.A. Programme, The students will be able to
PO 1	PROGRAMME KNOWLEDGE AND ENVIORNMENT SUSTAINABILITY Acquire a strong foundation in the areas of Commerce, Management and Information Technology that needs to respond to the constantly changing Business and Legal environment.
PO 2	CRITICAL THINKING AND DECISION-MAKING SKILLS Analyse and develop solutions through various computational techniques for real time problems in all areas of Business Management specially Finance, Marketing, Human Resources and Operations.
PO 3	ENTREPRENEURSHIP SKILLS AND COMPETENCY DEVELOPMENT Apply the competencies and creativity required to undertake entrepreneurship as a desirable and feasible career option or be employed in various positions in industry, academia and Government.
PO 4	TEAM WORK AND PROFICIENCY DEVELOPMENT Imbibe professionalism to embrace new opportunities of emerging technologies, leadership and team work in a dynamic ethical business scenario.
PO 5	PROFESSIONAL SKILLS AND EMPLOYABILITY Internalize the learned concept of Business and Commerce that will enable them to become skilled professionals and to enhance the career prospects.

PROGRAMME SPECIFIC OUTCOMES FOR BUSINESS ADMINISTRATION

BBA

PSO NO	Programme Specific Outcomes Students of Business Administration will be able to	POs Addressed
PSO1	Apply frameworks and tools to arrive at informed decisions in profession and practice, remarkable balance between business and social dimensions.	PO1, PO3
PSO2	Solid foundation to pursue professional careers and take up higher learning courses.	PO2, PO5
PSO3	Function effectively as a member, leader, individual or group in diverse environment.	PO4
PSO4	Fostering entrepreneurship by providing understanding of the fundamentals of creating and managing innovation, new business development and high-growth potential entities.	PO3
PSO5	Apply ethical principles and commitment towards professional ethics and responsibility.	PO4, PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF BUSINESS ADMINISTRATION

BBA

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
I	I	Language Course - I (LC)	Ikkala Elakkiyam	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar- I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French – I	22ULF1						
	II	English Language Course - I (ELC)	Functional English for Effective Communication - I	22UE1	6	3	3	25	75	100
	III	Core Course - I (CC)	Management Concepts	22UBA1CC1	6	6	3	25	75	100
		Core Course - II (CC)	Financial Accounting	22UBA1CC2	6	6	3	25	75	100
		Allied Course - I (AC)	Managerial Economics	22UBA1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course – I (AECC)	UGC Jeevan Kaushal Universal Human Values	22UGVE	2	2	-	100	-	100
			Total			30	23			

II	I	Language Course - II (LC)	Idaikkala Elakkiyamum, Pudhinamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar - II	22ULH2						
			Poetry, Textual Grammar and Alankara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course – II (ELC)	Functional English for Effective Communication - II	22UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Elements of Marketing	22UBA2CC3	6	6	3	25	75	100
		Core Course - IV(CC)	Business Statistics	22UBA2CC4	6	6	3	25	75	100
		Allied Course - II (AC)	Business Environment	22UBA2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course- II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	23				600



**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF BUSINESS ADMINISTRATION**

BBA

**LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)
(For the candidates admitted from the academic year 2022 – 2023 onwards)**

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
III	I	Language Course- III (LC)	Kappiyamum, Nadagamum	22ULT3	5	3	3	25	75	100
			Hindi Literature & Grammar - III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
			Intermediate French – I	22ULF3						
	II	English Language Course III (ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100
	III	Core Course - V (CC)	Organizational Psychology	22UBA3CC5	6	6	3	25	75	100
			Core Practical - I (CP)	Computer Applications Package for Managers - MS-Office (P)	22UBA3CC1P	5	5	3	40	60
		Allied Course - III (AC)	Business Law	22UBA3AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course – III (AECC)	Innovation in Entrepreneurship	22UGIE	2	1	-	100	-	100
			Generic Elective Course –I (GEC)	Stock Exchange Practices	22UBA3GEC1	2	2	3	25	75
		Special Tamil -I		22ULC3BT1						
			Basic Tamil -I	22ULC3ST1						
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total			30	23					700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	Pandaiya Elakkiyamum, Ureinadaium	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course-IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100
	III	Core Course - VI (CC)	Cost Accounting	22UBA4CC6	5	5	3	25	75	100
			Core Practical - II (CP)	Computer Applications Package for Managers -Tally (P)	22UBA4CC2P	5	5	3	40	60
		Allied Course - IV (AC)	Company Law	22UBA4AC4	4	3	3	25	75	100
			Internship	22UBA4INT	-	2	-	-	-	100
	IV	Generic Elective Course – (GE) II	Export Import Management	22UBA4GEC2	2	2	3	25	75	100
			Special Tamil -II	22ULC4BT2						
			Basic Tamil - II	22ULC4ST2						
	IV	Skill Enhancement Course – I (SEC)	Stress Management	22UBA4SEC1	2	2	3	25	75	100
V	Extra Credit Course	SWAYAM		As per UGC Recommendation						
	Total			30	25					800



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF BUSINESS ADMINISTRATION

BBA

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
V	III	Core Course - VII (CC)	Entrepreneurial Development	22UBA5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Research methods in Management	22UBA5CC8	5	5	3	25	75	100
		Core Course - IX (CC)	Management Accounting	22UBA5CC9	5	5	3	25	75	100
		Core Course - X (CC)	Digital Marketing	22UBA5CC10	5	5	3	25	75	100
		Discipline Specific Elective – I (DSE)	Basics of Income Tax	22UBA5DSE1A	5	4	3	25	75	100
		Managerial Communication	22UBA5DSE1B							
		Retail Management	22UBA5DSE1C							
	IV	Ability Enhancement Compulsory Course- IV (AECC)	UGC Jeevan Kaushal Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Statistical Package for Managers – SPSS (P)	22UBA5SEC2P	2	2	3	40	60	100
	V	Extra Credit Course	SWAYAM		As per UGC Recommendation					
	Total			30	29					700

VI	III	Core Course - XI (CC)	Human Resource Management	22UBA6CC11	5	5	3	25	75	100
		Core Course - XII (CC)	Financial Management	22UBA6CC12	5	5	3	25	75	100
		Core Course - XIII (CC)	Services Marketing	22UBA6CC13	4	4	3	25	75	100
		Core Course - XIV (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	Business Analytics	22UBA6DSE2A	5	4	3	25	75	100
		Global Business Management	22UBA6DSE2B							
		Business Ethics	22UBA6DSE2C							
	V	Project	Project work	22UBA6PW	5	3	-	-	-	100
			Gender Studies	22UGGS	1	1	-	100	-	100
			Extension Activities	22UGEA	0	1	0	--	--	--
	Total			30	27					700
		Grand Total		180	150					4100

Courses & Credits for BBA Programme

Part	Course	No of Courses	Credits	Total
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	16	84	109
	Project Work	1	3	
	Internship	1	2	
	First Allied	2	6	
	Second Allied	2	6	
IV	DSE	2	8	15
	GEC	2	4	
	SEC	2	4	
	AECC-I Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
V	AECC-IV-Professional Skills	1	2	02
	AECC-VGender Studies	1	1	
	Extension Activities	--	1	
		41		150

CORE COURSE I – MANAGEMENT CONCEPTS

2022 – 2023 Batch Onwards

Course Objectives:

- To acquaint the student with a conceptual framework for understanding the basic theories of management, planning, goal setting, decision making, organizational structure, and effective control mechanisms.
- To utilize these concepts in various decisive functions of an organizations.

Pre-Requisites: Basic Knowledge in Business Studies

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and acquire the concepts of functions of Management.	K1, K2
CO2	Apply the concepts of Planning and Budgeting process in Business.	K3
CO3	Discuss the principles and decision-making process in an organization.	K3
CO4	Analyse the knowledge of Business organization structure and its resources.	K4
CO5	Analyse the techniques of controlling and budgeting.	K4

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	1	3	1	3	3	3	1	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Management - Meaning – Definition – Nature – Importance and Functions – Levels of Management – Administration Vs Management –Contribution of F.W. Taylor, Henry Fayol.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Planning - Meaning – Definition – Nature – Importance – Process – Types of plans – Objectives, Policies, Procedures, Rules, Strategies, Programmes and Budgets.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Organisation - Meaning – Definition – Nature – Importance – Principles – Formal and Informal Organisation – Types of Organisation - Centralization – Decentralization.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Directing – Definition – Features – Importance – Principles – Techniques of Direction. Decision making – Importance – Characteristics – Steps in decision making process.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Controlling – Need and Importance - Control Process – Techniques – Tradition and Modern method – Effective control system – Budgetary control.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Management as an Art, Science and Profession – Types of planning – Distinction between Centralization and Decentralization – Characteristics of Directing – Importance of Controlling.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Prasad, L.M. (2021), *Principles and Practices of Management*, 10th Edition, Sultan Chand and Sons.
2. Ramasamy, T. (2017), *Principles of Management*, 2nd Edition, Himalaya Publishing House.

Books for Reference:

1. Gupta, C.B. (2012), *Management principle*, 3rd Edition, Sultan Chand and Sons.
2. Dinkar and Pagare. (2018), *Business Management*, 6th Edition, Prentice Hall of India.
3. Tripathi and Reddy. (2021), *Principles of Management*, 7th Edition, Mc Graw Hill Education.
4. Koontz and odonnel weirich. (2018), *Principles of Management*, 4th Edition, Mc Graw Hill Education.

Web Resources:

1. <https://vtechworks.lib.vt.edu/bitstream/handle/10919/70961/Fundamentals%20of%20Business%20%28complete%29.pdf>
2. <https://studyresearch.in/2018/03/11/case-studies-principles-of-management/>
3. https://www.researchgate.net/publication/338967220_INTRODUCTION_TO_BUSINESS_MANAGEMENT
4. <https://www.just.edu.jo/~mqais/CIS151.html>

Pedagogy: Lectures, Quiz, Power Point Presentation, Assignments and Seminar.

Course Designer: Dr. A. SIVARANJANI, Assistant Professor.

CORE COURSE II - FINANCIAL ACCOUNTING

2022 – 2023 Batch Onwards

Semester I	Internal Marks 25		External Marks 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA1CC2	Financial Accounting	CORE	6	5

Course Objectives:

- The content of this course is designed to impart the basic knowledge of financial accounting theory, standards, principles and procedures to accounting problems and its application in business.
- To enable the students to acquire accounting skills and facilitate them to prepare final accounts of business and non-trading organization.

Pre-Requisite: Basic knowledge required in accounting concepts.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the basic concepts and their application in business.	K1,K2
CO2	Discuss the Financial Accounting standards.	K2
CO3	Apply the methods for valuing financial resources.	K3
CO4	Analyse the financial reports for managerial decision making.	K4
CO5	Evaluate the methods for preparing financial reports.	K4

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	2	3	3	3	1	3
CO5	3	3	1	3	1	2	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Accounting - Definition – Objectives – Scope – Accounting Concepts – Principles and Conventions – Double Entry Vs Single Entry – Books of Accounts.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	Financial Accounting Standards – Formation – Scope of Accounting standards. Trial Balance - Capital and Revenue – Classification of Expenditure – Capital and Revenue Profit - Capital and Revenue Loss.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	Journal – Ledger – Subsidiary Books – Purchase Book – Purchase Return Book – Sales Book – Sales Return Book – Cash Book – Double Column Book – Triple Column Cash Book – Petty Cash Book.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	Depreciation - Meaning – Causes – Methods of Depreciation – Straight Line Method – Written Down Value Method – Annuity Method.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	Preparation of Trading and Profit & Loss Account and Balance sheet of sole Proprietary Business with simple Adjustment.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Difference between single entry and double entry system – Objectives of Accounting standards – Difference between journal and Ledger accounting – Difference between straight line and written down value method – Difference between Trading and Profit & Loss Account.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4

Text Book:

1. Gupta, R. L.& Gupta,V. K. (2016), *Financial Accounting*, 13th Edition, Sultan Chand and Sons.
2. Maheswari, S.N. (2017), *Financial Accounting*, 2nd Edition, Vikas Publishing House.

Books for Reference:

1. Jain, S.P. & Narang, K.L. (2014), *Advanced Accountancy*, 10th Edition, Kalyani Publishing & Co.
2. Gupta, R.L & Radhasamy, L. (2018), *Advanced Accountancy*, 13th Edition, Sultan Chand and Sons.
3. Reddy, T.S. & Murthy, A. (2021), *Financial Accounting*, 2nd Edition, Margham Publications.

Web Resources:

1. www.accountingcoach.com
2. www.accountingweb.com
3. www.depreciationguru.com
4. www.accountingplay.com
5. www.accounting.com

Pedagogy: Lectures, Quiz and Assignments

Course Designer: Dr. A. SIVARANJANI, Assistant Professor.

ALLIED COURSE I - MANAGERIAL ECONOMICS

2022 – 2023 Batch Onwards

Semester I	Internal Marks 25	External Marks 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UBA1AC1	Managerial Economics	ALLIED	4	3

Course Objectives:

- To enable the students to learn the various economic concepts and their application in business decisions.
- To make students to understand the relevance of economics in business decisions.
- To equip the students with economic tools for business analysis.

Pre-Requisite: Basic knowledge in Economics.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain the basic concepts of Managerial Economics.	K1, K2
CO2	Define the concept of utility analysis and demand analysis.	K2
CO3	Analyze the various Micro and Macro Economic Tools to be applied in different Business Situations.	K3
CO4	Examine the alternate solutions for better profitability and Productivity of Industry.	K3
CO5	Analyze the Simple Economic Models for Business Units.	K4

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	3	2	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	2	3	1	3	2
CO5	3	3	1	3	1	3	3	3	3	1

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Managerial Economics- Meaning, Scope - Characteristics – Relationship with other disciplines –Objectives of the firm.	10	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
II	Concept of utility – Law of Diminishing marginal utility –Consumer surplus - Demand Analysis – Law of demand –Elasticity of demand – Types.	9	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
III	Production Analysis - Law of Variable Proportion – Law of returns to scale – Economies of Large-Scale production - Cost concepts – Classifications and determinants – Cost Output relationship.	9	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
IV	Pricing – determinants of pricing –Revenue and Revenue curves –Relationship between Average revenue, Marginal revenue and Total Revenue.	9	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
V	Market Structure: Perfect competition – Monopoly and monopsony – Price discrimination – Monopolistic Competition – Oligopoly. National Income – Concepts, Measurement and difficulties in measurement.	8	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Nature of Managerial Economics – Exceptions in Law of Demand – Classification of Economics of Large-scale production – Objectives of Pricing - `Difference between perfect competition and Monopoly.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Varshney, R.L. & Maheswari, K.L. (2018), *Managerial Economics*, 19th Edition, Sultan Chand and Sons.
2. Cauvery, R. SudhaNayak, M. Giriza, & Meenakshi, R. (2015), *Managerial Economics*, 3rd Edition, Sultan Chand and Sons.

Books for Reference:

1. Sankaran, S. (2013), *Managerial Economics*, 5th Edition, Margham Publication.
2. Mehta, P.L. (2016), *Managerial Economics Analysis, Problems and Cases*, 21st Edition, Sultan Chand and Sons.
3. Jhingam, M.L. & Stephen, J.K. (2014), *Managerial Economics*, 2nd Edition, Vrinda Publicaions Private Limited.

Web Resources:

1. <https://www.managementstudyguide.com/managerial-economics.htm>
2. https://www.researchgate.net/publication/327882739_Managerial_Economics_Concepts_and_Tools

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Dr.M.NEELA, Associate Professor.

CORE COURSE III – ELEMENTS OF MARKETING

2022 – 2023 Batch Onwards

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA2CC3	ELEMENTS OF MARKETING	CORE	6	5

Course Objectives:

- To acquaint the students with the functions and segmentations of market environment.
- To enable the students, understand the development of new product upcoming in the market.
- To upgrade the students regarding the various emerging markets in a dynamic market environment.

Pre-Requisites: Basic Knowledge in Marketing.

Course Outcomes:

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Knowledge Level
CO1	Understand and acquire marketing concepts and functions of Marketing.	K1
CO2	Classify and understand the various approaches to segmentation and buyer behaviour, decision process.	K2
CO3	Identify the need of new product development and pricing objectives, importance and methods.	K2
CO4	Estimate the various classification of advertising and selling and apply the knowledge as a tool for promotion.	K3
CO5	Apply the Knowledge for recent trends in marketing.	K3

MAPPING OF CO WITH PO AND PSO :

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	1	3	1	3	3	3	1	3

“1”-Slight(Low) Correlation-“2”- Moderate (Medium) Correlation-

“3”- Substantial (High) Correlation –“-“ indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Marketing – Definition, Scope and importance of Marketing, Functions of marketing – Marketing concepts – Marketing Mix, Marketing Information System.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Market Segmentation – Approaches to Segmentation – Factors influencing buyer behavior – Buying Decision Process, Marketing environment.	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Product life cycle – New product development process –Product line – Pricing objectives and importance – Factors influencing price – Pricing methods.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Promotion Mix – Elements – Advertising – Classification of Advertising– Advertising media – Types of media – Personal Selling – Functions –Process.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Recent trends in marketing – Social media marketing – Online marketing – Telemarketing– Green marketing.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Role and Functions of Marketing Manager- Product Positioning - Product mi x- Strength and Weakness of Personal selling – Basic Concepts of Niche Marketing & Guerrilla Marketing.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. Rajan Nair.(2015), *Marketing*, Sultan Chand & Sons.
2. Pillai & Bhagavathi, (2016), *Modern Marketing*, 5th Edition, S. Chand & Company.

Books for Reference:

1. Philip Kotler, (2001), *A Framework for Marketing Management*, 1st Edition, Prentice Hall of India.
2. Rajan Saxena, (2005), *Marketing Management*, 3rd Edition, Tata McGraw Hill Publishers.
3. Sherlekhar, *Marketing Management*, 14th Edition, Himalaya Publishing House Pvt. Ltd,
4. Varshney R.L and Gupta S.L, (2016), *Marketing Management Text & Cases*, 3rd Edition, Sultan Chand & Sons.

Web Resources:

1. <https://www.tutorialspoint.com>
- 2. <https://www.yieldify.com> .
- 3. <https://www.uschamber.com>
4. <https://edynamiclearning.com>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Ms. P. THANGAMANI, Assistant Professor.

CORE COURSE IV - BUSINESS STATISTICS

2022 – 2023 Batch Onwards

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA2CC4	BUSINESS STATISTICS	CORE	6	5

Course Objectives:

- To equip the students to solve problems statistically.
- To promote the students to analyze management problems in research and decision making.
- To understand the basic knowledge on graphical representation.

Pre-Requisites: Basic Knowledge in Statistics.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Examine the basics of Statistics in Business and Analyze the data – Graphs and Diagrams.	K1
CO2	Analyze the data – Graphs and Diagrams.	K2
CO3	Estimating the measures of central tendency – Mean, Median, Mode.	K2
CO4	Acquire the conceptual knowledge of measures of dispersion.	K2
CO5	Apply and practice of the simple correlation and Regression analysis	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	2	3	3	3	3	2	3
CO5	3	3	1	2	1	3	3	1	2	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVELS
I	Introduction to statistics – Definition – Nature – objectives - scope – Uses and limitations of statistics in Business- Data-Sources of data – Frequency distribution - Data grouping - classification and tabulation.	12	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	Introduction to Graphs - Diagrammatic representation- One, Two and Three dimensional Diagrams – Graphic representations – Histogram, Frequency polygon and frequency curve, Ogives.	17	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	Measures of central tendency – Mean, Median, Mode, Geometric mean and Harmonic mean – Uses and limitations of measures of central tendency – skewness and kurtosis.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	Measures of Dispersion, Range, Co-efficient of Range, Quartiles, Inter-Quartile Range and Quartile Deviation, Coefficient of Quartile Deviation, Mean Deviation, Coefficient of Mean Deviation, Standard Deviation, Coefficient of Variation.	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	Correlation – Definition – Correlation analysis – Types of Correlation - Karl Pearson’s Coefficient of correlation and Spearman’s Rank correlation – Uses of Correlation Analysis - Regression Analysis – Definition – Regression Equations.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External examination) Statistics as a Subject of Study- Data and Information - Statistical variables: Qualitative and Quantitative - Sampling: population and samples - Parameter and Statistics - Sampling methods- Random Sampling and Non – Random Sampling.		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

- 1 .Dr. S P Gupta,(2021), *Statistical Methods*, 46th Edition, Sultan Chand Publications.

Books for Reference:

1. S.P.Gupta & M.P.Gupta, (2013), *Business Statistics*, 6th Edition, Himalaya Publishing House.
2. R.S.N.Pillai & Bagavathi, (2010), *Statistics*, 7th Edition, Sultan Chand and Sons.
3. M.C. Shukla & S. C.Gulshan, (2010), *Statistics – Theory and Practice*, 6th Edition, Sultan Chand and Sons.

Web Resources:

- 1 <https://www.geeksforgeeks.org/introduction-of-statistics-and-its-types/>
- 2 <https://flexbooks.ck12.org>
3. <https://statistics.laerd.com/statistical-guides>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Dr.S.THAMARAISELVI, Associate Professor.

ALLIED COURSE II - BUSINESS ENVIRONMENT

2022 – 2023 Batch Onwards

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UBA2AC2	BUSINESS ENVIRONMENT	ALLIED	5	3

Course Objectives:

- To Identifying business opportunities.
- To promote basic understanding of the concept of Business Environment.
- To make learners the impact of environment on business.
- To learn Macro and Micro Economic Environment in Business.

Pre-Requisites: Basic Knowledge in Business Environment.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Enable the students to acquire basic ideas about Business environment and its components	K1, K2
CO2	The students will be able to demonstrate and develop conceptual framework of business environment and generate interest in business	K2
CO3	Students will have a fair understanding of the Business	K2
CO4	Students will know the concept of business environment and factors influencing the environment	K2
CO5	Students will get to learn the latest trends in the Business	K3

MAPPING OF CO WITH PO AND PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	1	3	3	2	3	2
CO2	2	3	3	3	3	3	1	2	2	3
CO3	3	1	2	2	2	3	2	3	3	2
CO4	3	2	2	3	3	1	3	3	3	2
CO5	2	2	2	3	3	2	3	2	2	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction: Business - Meaning, Objectives, Scope, Nature and Characteristics of Business. Business Environment- Types of Environments – Internal, External, Micro and Macro Environment. Process and limitations of Environmental Analysis.</p>	13	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
II	<p>Economic Environment: Meaning of Economic Environment- Nature, factors affecting Economic Environment - Basic Economic System- Capitalism, Mixed Economy, Socialist Economy. Liberalization, Privatization, Globalization (LPG) – Nature and Objectives.</p>	14	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
III	<p>Political Environment: Political Environment- Meaning, Importance of Political Environment- Role of Political Environment in Business - Political Systems- Political Intervention and Participatory role.</p>	15	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
IV	<p>Socio-Cultural Environment: Nature and impact of Culture on Business, Business and Society, Business and Culture, Language, Culture and Organizational Behaviour, other Social/Cultural factors, Social Responsibility of Business-CSR.</p>	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
V	<p>Technological Environment: Concept and Significance of Technological Environment, Innovation, Technological leadership and Followership, Sources of Technological Dynamics, Impact of Technology on Globalization, Transfer of Technology, Status of Technology in India.</p>	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3
VI	<p>SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Factors affecting Business Environment-Economic environment in India – Challenges in Political Environment – Importance of CSR -Impact of Technology.</p>		CO1 CO2 CO3 CO4 CO5	K1 K2 K3

Text Book:

1. K.Aswhathappa (2014) – *Essentials of Business Environment* –13th Edition Himalaya Publishing House.
2. VeenaLeshavPailwar (2012) – *Economic Environment of Business* –3rd Edition Prentice Hall Learning Pvt Ltd.

Books for Reference:

1. Rangarajan, C.A.; *Perspective in Economics*, S.Chand & Sons, New Delhi
2. Cherunilam, Francis; *Business Environment - Text and Cases*, Himalaya Publishing House.
3. Shaikh Saleem *Business Environment*, 2nd Edition, Pearson Publications.
4. P.K. Ghosh, *Business Environment*, Sultan Chand & sons.

Web Resources:

1. <https://www.studocu.com/in/document/university-of-kerala/business-environment/introduction-definit>.
2. <https://www.vedantu.com/commerce/economic-environment>
3. <https://www.mbaskool.com/business-concepts/marketing-and-strategy-terms/2515-political-environme>

Pedagogy: Lecture, Power Point Presentation, Assignment, Seminar.

Course Designer: Ms. A. SUGANYA, Assistant Professor.



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with A Grade by NAAC
ISO 9001:2015 Certified
Annamalai Nagar, Tiruchirappalli -18.

PG & RESEARCH DEPARTMENT OF COMMERCE

DATE: 28.10.2022

VENUE: E-Cell & Google Meet

TIME: 11.00 a.m.

THE AGENDA FOR THE SEVENTH MEETING OF THE BOS

1. ITEM NO. BOS/07/01

To consider and to approve the **Programme Structure** (Six Semesters) of **B.Com.** for 2022 - 2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

2. ITEM NO. BOS/07/02

To consider and to approve the **II Semester syllabus** of **B.Com.** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

3. ITEM NO. BOS/07/03

To consider and to approve the **Programme Structure** (Six Semesters) of **B.Com. CA** for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

4. ITEM NO. BOS/07/04

To consider and to approve the **II Semester syllabus** of **B.Com. CA** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

5. ITEM NO. BOS/07/05

To consider and to approve the **Ability Enhancement Compulsory Course – III (AECC) Innovation and Entrepreneurship of Entrepreneurial Development Cell** in II Semester for Science Stream and in **III Semester for Arts Stream** for 2022 – 2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

6. ITEM NO. BOS/07/06

To consider and to approve the **Programme Structure** (Four Semesters) of **M.Com.** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

7. ITEM NO. BOS/07/07

To consider and to approve the Ratification of **I Semester Discipline Specific Elective** subject code of **M.Com.** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

8. ITEM NO. BOS/07/08

To consider and to approve the **II Semester syllabus** of **M.Com.** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

9. ITEM NO. BOS/07/09

Appreciation of Board of Studies Members who contributed to prepare syllabus.

10. ITEM NO. BOS/07/10

Any other matter with the permission of the Chair.



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PG & RESEARCH DEPARTMENT OF COMMERCE

MINUTES OF THE SEVENTH MEETING OF THE BOARD OF STUDIES

DATE: 28.10.2022

VENUE: E-CELL& Google Meet

TIME: 11.00 a.m.

Members Present:

- | | |
|--|--|
| 1. Dr. N. SAVITHRI | Chairperson & Head |
| 2. Dr. J. GAYATHRI* | University Nominee, Department of Commerce & Financial Studies, Bharathidasan University, Tiruchirappalli. |
| 3. Dr. SUNIL KUMAR GUPTA* | Subject Expert, IGNOU, New Delhi. |
| 4. Dr. ABDUL RAHEEM BIN MOHAMAD YUSOF* | International Academic Expert, Quest International University, Malaysia. |
| 5. Mr. K. KANAGASABAPATHY | Industrial Expert |
| 6. Dr. R. SUDHA | Alumna, Thanthai Periyar Government Arts & Science College, Tiruchirappalli. |
| 7. Ms. N. ARUNA | Member, Associate Professor |
| 8. Dr. S. SHAMEEM | Member, Associate Professor |
| 9. Dr. S. SUDHA | Member, Associate Professor |
| 10. Dr. P. KAVITHA | Member, Associate Professor |
| 11. Dr. D. RAMYA | Member, Assistant Professor |

12. Dr. C. SUBHA	Member, Assistant Professor
13. Dr. S. JAYALAKSHMI	Member, Assistant Professor
14. Ms. SHILPA A. TALREJA	Member, Assistant Professor
15. Dr. P. BANU	Member, Assistant Professor
16. Dr. J. PRABA	Member, Assistant Professor
17. Ms. J. LALITHAMBIGAI	Member, Assistant Professor
18. Ms. D. INDUMATHI	Member, Assistant Professor
19. Ms. B. LAVANYA	Member, Assistant Professor
20. Ms. A. VINODHINI	Member, Assistant Professor
21. Ms. S. J. SUREYA	Member, Assistant Professor
22. Ms. G. KANAGAVALLI	Member, Assistant Professor
23. Ms. S. PRAVEENA	Member, Assistant Professor

***Members who have attended the BoS meet through online.**

The leave of absence was granted to

1. Dr. N. C RAJASHREE, Subject Expert, Guru Nanak College, Chennai.

Action Taken Report of Sixth BoS Meeting held on 07.05.2022

The chairman of the BoS read the minutes of the sixth meeting and the Resolutions pertaining to PSO (Programme Specific Outcome), Programme Structure and I Semester syllabus of 2022 – 2023 batch and onwards framed for B.Com., B.Com. CA and M.Com.

Minutes of the Seventh Meeting of the BoS held on 28.10.2022 at 11.00 a.m.

The following Resolution were passed by the BoS members

Resolution No.: BOS/07/01

Resolved to approve the **Programme Structure** (Six Semesters) of **B.Com.** for 2022 - 2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

Resolution No.: BOS/07/02

Resolved to approve the **II Semester syllabus of B.Com.** for 2022-2023 batch and

onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18 with the following revision of syllabus for

1. Core Course – I (22UCO2CC3) - Financial Accounting – II

• **Topics included in**

Unit – I : Fundamentals of Partnership Accounts and Capital ratio

Unit – II : Admission of a Partner and Valuation of Goodwill

Unit – III : Retirement and Death of a Partner.

• **Topics reduced from**

Unit – I : Branch and Departmental Accounts

Unit – II : Hire Purchase and Instalment Purchase System

Unit – III : Admission of a Partner

2. Core Course – II (22UCO2CC4) - Fundamentals of Marketing

Topics included in

Unit – I : Modern concepts of Marketing, Nature and importance of Marketing

Unit – V : Marketing Research, Importance of Marketing Decision, Interactive Marketing, Use of Internet, Online Action.

Topics reduced from

Unit – I : 7P's of Marketing

Unit – III : Product Mix

3. Allied Course – I (22UCO2AC2) – Banking Theory Law and Practice

• **Topics included in**

Unit – I : Central Banking Principles and Needs

Unit – II : Special Relationship

Unit – III : Promissory Note and Bills of Exchange

Unit – IV : Pledge essentials and rights

• **Topics reduced from**

Unit – I : Banking Regulation Act

Unit – II : Ombudsman Scheme

Unit – III : Precaution by Paying Banker

Unit – IV : Advances against Goods and Documents

Resolution No.: BOS/07/03

Resolved to approve the **Programme Structure** (Six Semesters) of **B.Com. CA** for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

Resolution No.: BOS/07/04

Resolved to approve the **II Semester syllabus of B.Com. CA** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18 with the following revision of syllabus for

1. Core Course – I (22UCC2CC3) - Modern Marketing

• **Topics included in**

- Unit – I : Relevance, Role and Functions of Marketing
- Unit – II : Product Differentiation and Market Segmentation
- Unit – III : Product Planning and Positioning
- Unit – V : Marketing Strategies for Competitors, Marketing of Services
Consumerism

• **Topics reduced from**

- Unit – I : Service Marketing, Types of Market and Goods.
- Unit – II : Theories of Buyer Behaviours and 7 O's of frame work.
- Unit – IV : Channel of Distribution
- Unit – V : Recent Trends in Marketing

Resolution No.: BOS/07/05

Resolved to approve the **Ability Enhancement Compulsory Course – III (AECC)** Innovation and Entrepreneurship of Entrepreneurial Development Cell in II Semester for Science Stream and in **III Semester for Arts Stream** for 2022 – 2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

Resolution No.: BOS/07/06

Resolved to approve the Programme Structure (Four Semesters) of M.Com. for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

Resolution No.: BOS/07/07

Considered and to approve the Ratification of I Semester Discipline Specific Elective subject code of M.Com. for 2022 – 2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

- ✓ As suggested by Academic Council, Unit – VI (Self Study) was introduced in all theory courses.
- ✓ APA format was followed for Text Books and Reference Books.
- ✓ Elective Course – I (EC) was changed as Discipline Specific Elective Course – I (DSE).

1. Dr. J. Gayathri suggested to bring Research Methodology as Core Course.

Resolution No.: BOS/06/08

Resolved to approve the II Semester syllabus of M.Com. for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy – 18.

1. Core Course –VII (22PCO2CC7) - Digital Marketing**• Topics included in**

Unit – IV : Design Digital Marketing, Situation Analysis, Digital Landscape, POEM Framework, Digital Advertising Market in India.

• Topics reduced from

Unit – IV : E-Mail marketing, Benefits, Virtual Marketing, Principles and Importance.

2. Core Choice Course – I (22PCO2CCC1A) - Security Analysis and Portfolio Management**• Topics included in**

Unit – I : Distinction between Investment, Speculation and Gambling, Securities Market ,

Risk and Return.

Unit–V : Portfolio Evaluation, Portfolio Revision, International Portfolio Investment, Management of Portfolio: Passive and Active Management.

- **Topics reduced from**

Unit – I : Investment Media, Sources of Investment information.

Unit – II : Indian market, New issue Market, Secondary Market, Stock Exchanges, NSE and BSE, Trading Mechanism, Online Trading, SEBI and Investors Protection.

Unit – V : Regulation on the investments, UTI, SEBI, RBI Guidelines, Exchange Traded Funds (ETF) and Gold ETFs , Analysis and Taxation.

3. Discipline Specific Elective Course – II (22PCO2DSE2A) - Logistics and Supply Chain Management

- **Topics included in**

Unit – I : Reverse Logistics, Scope and Design

Unit– II : Supply Chain relationship, Channel relationship, Dimensions, Approaches to study channels.

Unit – III : Supply Chain Information Systems Modules

Unit – V : Warehouse Management, Storage Functionality and Principles, Warehouse Benefits, Types

- **Topics reduced from**

Unit – I : ERP, SAP and Oracle

Unit – III : Reverse Logistics, Scope and Design

4. Discipline Specific Elective Course – II (22PCO2DSE2B) - Retail Management

Entirely modified five units.

Newly introduced Courses:

- 1. Core Course – V (22PCO2CC5) - Cost and Management Accounting**
- 2. Core Course – VI (22PCO2CC6) – Business Analytics**
- 3. Core Choice Course – I (22PCO2CCC1B) – Insurance and Risk Management**
- 4. Core Choice Course – I (22PCO2CCC1C) – Brand Management**
- 5. Discipline Specific Elective Course – II (22PCO2DSE2C) – Business Information System**

Resolution No.: BOS/06/09

The Chairman appreciated the efforts of the members of Board of Studies, for their valuable contribution in preparing the syllabus.

N. Sanki
28/10/22
(Dr. N. Savithri)

Chairman

N. Kanagasabapathy

Mr. N. Kanagasabapathy
President,
Trichy Trade Centre, Trichy.

R. Sudha 28/10/2022

Dr. R. Sudha,
Assistant Professor,
Department of Commerce,
Thanthai Periyar Govt. Arts &
Science College, Trichy.

N. Sanki

**DEAN OF ARTS
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU**

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TIRUCHIRAPPALLI

**PG & RESEARCH DEPARTMENT OF
COMMERCE**



**LEARNING OUTCOME BASED
CURRICULUM FRAMEWORK
(CBCS - LOCF)**

B.Com.

2022 -2023 and Onwards

VISION

Commitment to pursue excellence in commerce education, while equipping students with knowledge and skills in commerce stream, inculcate values, identify hidden talents, provide opportunities for students to realize their full potential and thus shape them into national assets, and to pursue a real holistic development, integrity moral and ethical uprightness.

MISSION

- To promote excellent education in the changing environment of information and communication technology and commerce sectors.
- Creating an urge in students to take up entrepreneurship in online to be successful by standing on their feet instead of being dependent on others.
- Grooming youth to become a truly global personality well equipped to deal with the modern world and its challenges.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Com., B.Com. CA,

B.B.A. PROGRAMME

PO NO.	On completion of B.Com. /B.Com. CA / B.B.A. Programme, The students will be able to
PO 1	PROGRAMME KNOWLEDGE AND ENVIORNMENT SUSTAINABILITY Acquire a strong foundation in the areas of Commerce, Management and Information Technology that needs to respond to the constantly changing Business and Legal environment.
PO 2	CRITICAL THINKING AND DECISION MAKING SKILLS Analyse and develop solutions through various computational techniques for real time problems in all areas of Business Management specially Finance, Marketing, Human Resources and Operations.
PO 3	ENTREPRENEURSHIP SKILLS AND COMPETENCY DEVELOPMENT Apply the competencies and creativity required to undertake entrepreneurship as a desirable and feasible career option or be employed in various positions in industry, academia and Government.
PO 4	TEAM WORK AND PROFICIENCY DEVELOPMENT Imbibe professionalism to embrace new opportunities of emerging technologies, leadership and team work in a dynamic ethical business scenario.
PO 5	PROFESSIONAL SKILLS AND EMPLOYABILITY Internalize the learned concept of Business and Commerce that will enable them to become skilled professionals and to enhance the career prospects.

PROGRAMME SPECIFIC OUTCOMES FOR B.Com.

PSO NO	The Students of B.Com. will be able to	POs Addressed
PSO1	Acquire fundamental knowledge in the fields of Commerce, Management, Accounts, Finance and overall general legal framework of the business.	PO1 PO2
PSO2	Inculcate critical thinking and problem-solving skills to excel in technologies and its services used ethically in various sector.	PO2
PSO3	Identify business opportunities to create and manage innovations and entrepreneurship.	PO3
PSO4	Become acquainted with commercial knowledge and professional skills to react the most appropriate way when faced with challenges.	PO4 PO5
PSO5	Obtain the knowledge and skills required for further professional education and research.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE
B.Com.– PROGRAMME STRUCTURE

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total									
								Internal	External										
I	I	Language Course - I (LC)	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100									
			Hindi Literature & Grammar - I	22ULH1															
			History of Popular Tales Literature and Sanskrit Story	22ULS1															
			Basic French -I	22ULF1															
	II	English Language Course - I (ELC)	Functional English for Effective Communication - I	22UE1	6	3	3	25	75	100									
	III	Core Course - I (CC)	Financial Accounting - I	22UCO1CC1	6	6	3	25	75	100									
											Core Course - II (CC)	Management Principles and Application	22UCO1CC2	6	6	3	25	75	100
											First Allied Course - I (AC)	Business Economics	22UCO1AC1	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal - Universal Human Values	22UGVE	2	2	-	100	-	100									
			Total			30	23				600								

II	I	Language Course - II (LC)	Idaikkala Ilakkiyamum, Pudhinamum	22ULT2	5	3	3	25	75	100									
			Hindi Literature & Grammar - II	22ULH2															
			Poetry, Textual Grammar and Alankara	22ULS2															
			Basic French -II	22ULF2															
	II	English Language Course - II (ELC)	Functional English for Effective Communication - II	22UE2	6	3	3	25	75	100									
	III	Core Course - III (CC)	Financial Accounting - II	22UCO2CC3	6	6	3	25	75	100									
											Core Course -IV (CC)	Fundamentals of Marketing	22UCO2CC4	6	6	3	25	75	100
											First Allied Course - II (AC)	Banking Theory Law and Practice	22UCO2AC2	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100									
			Extra Credit Course	SWAYAM Online Course	As per UGC Recommendations														
		Total			30	23				600									

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCO1CC1	FINANCIAL ACCOUNTING – I	CORE	6	6

Course Objective

- To enable the students to understand the Accounting Standards and to apply the accounting principles in the Rectification of Errors, preparation of Final Accounts of sole trader, Non-Profit Organization, Bank Reconciliation Statement and Bills of Exchange.
- To provide accounting knowledge in Branch, Departmental and Hire Purchase businesses.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and outline the accounting concepts and standards.	K1, K2
CO2	Explain the purpose of financial accounting.	K2
CO3	Apply the accounting procedures for recording various financial transactions.	K3
CO4	Make use of accounting concepts to interpret the performance of business.	K3
CO5	Analyse and evaluate financial statement in any given context or situation	K4, K5

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	2	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation – “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Accounting Standards. Rectification of Errors – Classification –	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5

	Suspense Account. Final Accounts of a Sole Trader: Manufacturing Account – Trading Account – Profit and Loss Account – Balance Sheet – Adjustments.		CO5	
II	Bank Reconciliation Statement – Favourable and Unfavourable Balances. Bills of Exchange - Average Due Date – Account Current.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Accounts of Non-Profit Organisation – Receipt & Payment Accounts – Income & Expenditure Accounts – Balance Sheet – Adjustments.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Branch Accounts (Dependent Branches: Debtor System and Stock & Debtor System only) Departmental Accounts – Apportionment of Expenses – Inter – departmental Transfer at cost and Invoice price.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Hire Purchase System: Accounting Treatment – Calculation of Interest – Default and Repossession – Hire Purchase Trading Account: Debtors System and Stock & Debtor System.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Difference between Balance Sheet and Trial Balance, Adjustment and Closing Entries - Negotiable Instrument, Difference between Promissory note and Bills of Exchange - Difference between Branch and Department - Capital and Revenue items - Difference between Hire Purchase and Instalment Purchase.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Distribution of Marks: Theory 20% & Problem 80%

Text Book

1. Reddy, T.S, & Murthy A. (2020). *Financial Accounting*. 8th Revised Edition, Margham Publication.
2. Jain S.P, & Narang K.L. (2017). *Business Accounting*. 5th Edition, Kalyani Publishers.

Reference Books

1. Dalston L. Cecil & Jenitra L. Merwin. (2015). *Business Accounting*. 4th Edition, Learn Tech Publishers.
2. Gupta R.L, & Radhaswamy M. (2019). *Financial Accounting*. 8th Edition, Sultan Chand & Sons.
3. Arulanandam M.A, & Raman K.S. (2018). *Advanced Accountancy*. 7th Edition, Himalaya Publishing House.

Web References

1. <https://www.icaai.org/post/icaai-publications-accounting-standards-board>
2. <https://cleartax.in/s/accounting-standards>
3. https://newhorizonindia.edu/nhc_kasturinagar/wp-content/uploads/2020/06/AFA-4.pdf
4. <https://www.britannica.com/topic/bill-of-exchange>
5. <https://cleartax.in/g/terms/hire-purchase-agreements>
6. <https://corporatefinanceinstitute.com/resources/knowledge/strategy/npo-non-profit-organization/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. C. Subha.

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCO1CC2	MANAGEMENT PRINCIPLES AND APPLICATION	CORE	6	6

Course Objective

- To familiarize the students on the basic concepts of management in order to aid in understanding how an organization functions and the challenging issues a manager confronts in today's business firm.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic principles and concepts of management.	K1
CO2	Explain the functions of management and roles, skills of a manager.	K2
CO3	Apply and Integrate planning, organizing, decision-making, staffing and directing process in an organization.	K3
CO4	Analyze the situation that requires specific leadership, communication and control.	K4
CO5	Compare the range of motivation, coordination, leadership, dynamics and control in the business.	K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	3	2	3	2	3
CO2	3	2	3	3	3	3	3	2	3	2
CO3	3	3	2	3	3	3	2	2	3	3
CO4	3	2	3	3	2	3	3	2	3	3
CO5	2	3	2	3	3	3	3	2	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Management – Meaning – Definition – Nature and Scope – Features-Level of management –Management roles and skills –Management as an art or a science or a profession –Management thoughts: Scientific Management and Modern Management Thoughts - Principles and Functions of Management	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

II	Nature and Purpose of Planning – Planning Process – Types of Plans – Objectives – Management by Objectives (MBO) – Strategies – Types of Strategies – Policies – Decision Making – Types of Decision – Decision Making Process – Rational Decision-Making Process – Decision Making Under Different Conditions .	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4
III	Nature and Purpose of Organizing – Organization Structure – Line and Staff Authority – Departmentation – Span of Control – Centralization and Decentralization – Delegation of Authority.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Motivation – Meaning – Definition – Nature – Types of motivation – Theories of motivation – Leadership – Functions – Styles – Theories .	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4
V	Controlling – Meaning – Definition – Characteristics – Steps in controlling – Effective control – Control techniques. Co-ordination: Definition-Features and benefits of Co-ordination - Techniques of effective Co-ordination.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4
VI	Self Study for Enrichment (Not to be included for End Semester Examination). Approaches to Management – Management by Exception – 360 ⁰ Degree performance appraisal – Functions and responsibility of supervisor– Difference between Controlling and Co-ordination.	-	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4

Text Book

1. L.M. Prasad, 2021, Principles and Practice of Management, Sultan Chand & Sons.
2. K.D. Tripathi , 2017, Principles of Management, McGraw Hill Education .

Reference Books

1. T. Ramasamy, 2017 , Principles of Management, Himalaya Publishing House.
2. Dr. S.C. Saksena, 2019 , Principles of Business Management, Sahitya Bhawan Publications.

Web References

1. <https://cbseacademic.nic.in>
2. <https://ncert.nic.in/textbook/pdf>
3. <http://www.freebookcentre.net>
4. <https://www.egyankosh.ac.in>
5. <https://www.yourarticlelibrary.com>
6. <http://courses.washington.edu>
7. <http://www.nou.ac.in/econtent>
8. <https://www.toppers.com>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar and Group Discussion.

Course Designer

Ms. B. Lavanya

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCO1AC1	BUSINESS ECONOMICS	ALLIED	4	3

Course Objective

- To enable the students to interpret the demand function and elasticity interlinked with optimal pricing decisions and recognize different market structures.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and summarize the core economic principles, concepts and how they apply to a wide range of real-world issues.	K1,K2, K3
CO2	Apply the basic economic theory to make predictions and to analyze alternative economic policy options.	K3, K4
CO3	Outline the economic models in domestic and global context, to analyze individual decision making, how price and quantities are determined in product and factor market.	K2, K4
CO4	Analyze and interpret the concept of price and output decisions of the firms under various market structures.	K2, K4
CO5	Develop critical thinking and analytical abilities in resolving business problems by applying various tools and techniques of economics.	K3, K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3	3	2	2	2	3
CO2	3	2	2	2	3	3	3	2	2	3
CO3	3	2	2	2	3	3	3	2	2	3
CO4	3	2	2	2	3	3	3	2	2	3
CO5	3	2	3	2	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Business Economics - Meaning – Definitions - Characteristics – Distinction between Business Economics and Economics – Scope – Objectives – Roles and responsibilities of business economist.	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Theory of Demand Analysis: Demand determinants – Law of demand – Characteristics – Exceptions – Elasticity of demand – Price elasticity – Types – Determining factors – Change in demand and Elasticity of demand – Business applications of price elasticity – Concepts of income and cross elasticity of demand – Price elasticity of demand – Measurement of price elasticity of demand.	12	CO1,CO2 ,CO3,CO4 ,CO5	K1,K2,K3, K4,K5,K6
III	Demand Forecasting Methods: Introduction – Objectives – Types – Requirements for demand forecasting, Approaches, Methods – Features of a good forecasting method.	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Production Function: Introduction – Factors, Law of Variable Proportions – Law of returns to Scale, Producer’s equilibrium – Economics of Scale – ISO Quant Analysis – Cobb Douglas Production Function.	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Cost and Revenue Analysis: Cost classification – Real cost – Opportunity cost – Money cost – Explicit cost and implicit cost – Economic cost – Fixed cost and Variable cost – Total and Marginal cost – Behavior of short run and long run cost – Cost and output relations – Revenue concepts – Break Even Analysis – Profit Management – Nature, Theories and Measurement.	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Fundamental concepts of managerial economics - Advertising and demand, demand distinctions - Forecasting demand for new products - Elasticity of Supply - Monopoly, Oligopoly and Duopoly – Simple	-	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

concepts only.			
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Text Book

1. Ahuja H. L, (2016), Business Economics, 13th Edition, Sultan Chand & Sons.
2. R Cauvery, Sudhanayak U.K, Girija M, Meenakshi M.R, (2008), Managerial Economics, 7th Edition, S.Chand& Company Ltd.

Reference Books

1. Arymala T,(2013), Business Economics, 4th Edition, Vijay Nicole Imprints Pvt. Ltd.
2. Chaturvedi D.D. & Gupta S.L, (2010), Business Economics, 1st Edition, Vikas Publication

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1. <https://www.ncertbooks.guru/b-com-economics-notes/>
2. <https://www.toppr.com/guides/business-economics/theory-of-demand/demand-forecasting/>
3. <https://www.investopedia.com/ask/answers/121514/what-are-major-differences-between-monopoly-and-oligopoly.asp>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Capt. Dr. P. Kavitha

Semester I	Internal Marks: 100	External Marks: -		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UGVE	UNIVERSAL HUMAN VALUES	Part - IV	2	2

Course Objectives

- To enable the learners to learn the values of love and compassion.
- To foster the values of righteousness and service among the learners.
- To enhance the morale of the learners by inculcating the values renunciation and peace.
- To inspire the learners to practice the basic human values so as to make them become responsible citizens of the Nation.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth and Non - Violence	K2
CO3	Explain the value of Righteousness and Service	K3
CO4	Practice the values of Renunciation (sacrifice) & Peace	K4
CO5	Prioritize Human Values in their day today life	K5

Syllabus

UNIT - I

(6 Hours)

Love and Compassion

- **Introduction:** what is love? Forms of love for self, parents, family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore.

UNIT - II

(6 Hours)

Truth and Non - Violence

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- **Introduction:** what is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore

UNIT - III

(6 Hours)

Righteousness and Service

- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore.

UNIT - IV

(6 Hours)

Renunciation (sacrifice) & Peace

- Introduction: what is renunciation? Renunciation and sacrifice. Self-restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace

UNIT - V

(6 Hours)

Practicing human values

- What will learners learn/gain if they practice human values? What will learners lose if they Don't Practice human values?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, and Case Study.

Course Designer

Dr. G. Mettilda Buvaneswari.

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCO2CC3	FINANCIAL ACCOUNTING – II	CORE	6	6

Course Objectives

- To develop skills in the preparation of Partnership Accounts.
- To enable the students to apply the accounting concepts in the preparation of Royalty Accounts and Fire Insurance claims.

Prerequisite

Basic knowledge in Partnership Accounts.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall and relate appropriate concepts relevant to partnerships and corporations.	K1,K2
CO2	Define and outline the accounting procedures for the various partnership related transactions	K1,K2
CO3	Explain and apply the accounting procedures relating to admission, retirement and death of a partners	K2,K3
CO4	Define and Analyse the accounting procedure relating to insolvency of a partner.	K1, K4
CO5	Apply and explain the accounting concepts in the preparation of Royalty Accounts and Fire Insurance claims.	K2, K3

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	2	2	3	2
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	3	3	3	2	3	3
CO4	3	3	2	3	3	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of partnership Accounts – Profit and Loss Appropriation A/c – Capital Accounts of partners (fixed & fluctuating) – Capital ratio – Change in Profit Sharing Ratio – Past Adjustments & Guarantees.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4

II	Admission of a partner – Calculation of Sacrificing Ratio – Adjustment for Goodwill – Methods of valuation of Goodwill.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4
III	Retirement of a Partner – Death of a Partner.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4
IV	Dissolution of a Partnership Firm – Insolvency of a Partner – Garner vs Murray – Piecemeal Distribution.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4
V	Fire Insurance claims for loss of stock and profit – Royalty accounts.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Interest on capital – Interest on drawings – Partnership deed– Types of Partner- Modes of dissolution - Need for fire Insurance – sub- lease.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4

Theory 20% and Problem 80%

Text Book

1. Reddy, T.S, & Murthy A. (2021). Financial Accounting. 9thRevised Edition, Margham Publication.
2. Jain S.P, & Narang K.L. (2017). Business Accounting. 5thEdition, Kalyani Publishers

Reference Books

1. Dalston L. Cecil & Jenitra L. Merwin. (2015). Business Accounting. 4thEdition, Learn Tech Publishers.
2. Gupta R.L, & Radhaswamy M. (2019). Financial Accounting. 8thEdition, Sultan Chand & Sons.
3. Arulanandam M.A, & Raman K.S. (2018). Advanced Accountancy. 7thEdition, Himalaya Publishing House.

Web References:

1. <https://www.icaai.org/post/icaai-publications-accounting-standards-board>
2. <https://cleartax.in/s/accounting-standards>
3. https://newhorizonindia.edu/nhc_kasturinagar/wp-content/uploads/2020/06/AFA-4.pdf
4. <https://www.britannica.com/topic/bill-of-exchange>
5. <https://cleartax.in/g/terms/hire-purchase-agreements>
6. <https://corporatfinanceinstitute.com/resources/knowledge/strategy/npo-non-profitorganization/>

Pedagogy

Chalk and talk, Power Point Presentation, Assignment, Seminar and Quiz.

Course Designer

Dr. D. Sarala.

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UCO2CC4	FUNDAMENTALS OF MARKETING	CORE	6	6

Course Objective

- To identify factors and processes essential for designing marketing strategy.
- To enable the students to understand the concepts and importance of marketing and the development that has taken place in the global scenario.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the fundamental concepts and theories in marketing and Explain different types of market.	K1, K2
CO2	Summarize the important factors influencing consumer behavior and explain the product policy and development	K2
CO3	Apply different pricing strategies of a firm and identify various promotional programmes	K3
CO4	Analyse the importance of marketing research and strategies opted for market segmentation.	K4
CO5	Examine the factors influencing buyer behaviour and Categories the customers and their wants and needs	K4

Mapping of CO with PO and PSO

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	3	2	3	3	3	2	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	CO's	COGNITIVE LEVEL
I	Definition of Market and Marketing, Types of Market – Types of Goods – Evolution of Marketing – Difference between Selling and Marketing – Modern Concepts of Marketing – Nature and Importance of Marketing – Functions of Marketing.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Consumer Vs. Customer – Importance of Consumer Behaviour – Buying Process – Factors influencing Consumer Behaviour – Theories of Buyer Behaviour- 7O's Frame Work. Market Segmentation – Criteria's of effective Segmentation – Characteristics	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	and Benefits – Strategies opted for Market Segmentation.			
III	Product – Policy New Product Development – Product Life Cycle – Branding and Packaging – Pricing – Factors affecting Pricing – Kinds of Pricing.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Channels of Distribution – Importance – Factors affecting choice of distribution – Channel Members – Promotional Programme – Sales Promotions – Advertising – Personal Selling.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Recent developments in Marketing: Social Marketing – Online Marketing – Direct Marketing – Services Marketing – Green Marketing – Rural Marketing – Consumerism - Marketing Research – Importance of marketing decision – Interactive marketing – Use of internet – Online action.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Various environment affecting the marketing functions – Market targeting – Distribution logistics: importance and decisions factors to be considered in channel selection.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. R. S. N. Pillai & V. Bagavathi (2010). Modern Marketing. S. Chand & Co.
2. N Rajan Nair, Sanjith R Nair.(2015). Marketing, Sultan Chand & Sons.

Reference Books

1. Dhruv Grewal. (2018).Marketing. Tata McGraw Hill India.
2. Philip Kotler.(2015).Marketing Management. Sultan Chand & Sons.
3. S. A. Sherlekar , R. Krishnamoorthy, (2010). Marketing Management. Himalaya Publishing House.

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1. <http://gundasrinivas.com/wp-content/uploads/2020/11/Fundamentals-of-Marketing.pdf>
2. http://eprints.stiperdharmawacana.ac.id/24/1/%5BPhillip_Kotler%5D_Marketing_Management_14th_Edition%28BookFi%29.pdf
3. <https://library.wbi.ac.id/repository/212.pdf>
4. [http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final\(crc\).pdf](http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final(crc).pdf)

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. Shilpa A. Talreja.

Semester II	Internal Marks:25	ExternalMarks:75		
COURSECODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UCO2AC2	BANKING THEORY, LAW AND PRACTICE	ALLIED	5	3

Course Objective

- To the students aware of banking business and practices and to enlighten the students regarding the new concepts introduced in the banking system

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the knowledge of working of Indian banking system.	K1
CO2	Explain the broad functions of banking and lending policies and procedure	K2
CO3	Identify the banking product and list out the stakeholders in banking sector	K2, K4
CO4	Apply the various services offered in a banking sector.	K3
CO5	Analyse the banking innovations and latest online banking techniques.	K4

Mapping of CO with PO and PSO

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	2	2	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	CO's	COGNITIVE LEVEL
I	Banking – Meaning – Definition – Classification of Bank – Commercial banking – Functions of Commercial Banking – Central Banking – Need – Principles – Distinguish between Commercial Banking and Central banking.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Banker – Customer – Definition – General Relationship – Special relationship - Rights and Obligations of a banker –Who can be a customer – Various types of account – Types of Deposits – General precautions for opening Accounts – KYC Norms.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Negotiable Instruments Act – Definition - Types of Negotiable Instruments -	18	CO1, CO2,	K1, K2, K3, K4

	Promissory Note – Bill of Exchange - Cheques – Crossing of Cheques – Types - Endorsement – Meaning -Definition - Kinds –Truncated cheques and e- cheques.		CO3, CO4, CO5	
IV	Loans and Advances – Principles of sound lending – Types of loans & Advances – Lien – Types – Exception to right of Lien – Mortgage – Forms of mortgage - Pledge – Essential – Rights of bank - Hypothecation – Characteristics.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	E – Banking – Electronic Delivery channels – Credit Cards – Debit Cards – ATM – Internet Banking – E- Banking transactions – Mobile banking – Inter Bank Mobile Payment (IMPs) – Virtual Currency – Model of E-banking – Advantages – Constraints – Security measures – Electronic Payment System (EPS) – NEFT, RTGS, SWIFT, WIRE.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self Study for Enrichment (Not to be included for End Semester Examination). Subsidiary Service – Pass book – Material alteration – Marking – Paying banker – Collecting banker.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Sundaram & Varshney, 2014, Banking Theory Law & Practice, Sultan Chand & Sons.
2. Dr. S. Gurusamy, 2016, Banking Theory Law & Practice, Vijay Nicole Imprints(p). Ltd

Reference Books

1. E. Gorden and K. Natarajan, 2017, Banking Theory Law & Practice, Himalaya Publishing House.
2. Kandasami. K.P, 2010, Banking Theory Law & Practice, Sultan Chand & Company

Web References

1. <https://byjus.com/commerce/functions-of-commercial-banks/>
2. <https://www.forbes.com/advisor/in/banking/what-kind-of-bank-accounts-exist/>
3. <https://www.elearnmarkets.com/blog/various-types-of-bank-deposits/>
4. <https://keydifferences.com/difference-between-loans-and-advances.html>
5. <https://www.toppr.com/guides/business-laws-cs/negotiable-instruments-act/definition-of-negotiable-instruments/>
6. <https://www.toppr.com/guides/business-economics-cs/money-and-banking/e-banking/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Mrs. D. Indumathi.

Semester: II	Internal Marks:100			
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UGEVS	ENVIRONMENTAL STUDIES	Part - IV	2	2

Course Objective

- To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K1, K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classify various types of ecosystem with its structure and function.	K2, K3
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment and explain protection acts	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1,CO2, CO3,CO4	K1, K2, K3,
II	<p>Natural Resources: Renewable and non-renewable resources:</p> <p>a. Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.</p> <p>b. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.</p> <p>c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.</p> <p>d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.</p> <p>e. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.</p> <p>f. Land resources: Land as resources, land degradation, man induced Land slides, soil erosion and desertification.</p> <p>g. Role of an individual in conservation of natural resources.</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3
III	<p>Ecosystems</p> <p>Concept, Structure and function of an ecosystem. Producers, consumers and decomposers Energy flow in the eco system and Ecological succession.</p> <p>Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem:- Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)</p>	06	CO1, CO2, CO3,CO4	K1, K2, K3

IV	<p>Bio diversity and Environmental Pollution Introduction, types and value of biodiversity. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Definition, Causes, effects and control measures of:</p> <p>a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise pollution e. Nuclear hazards</p> <p>Solid waste Management: Causes, effects and control measures of urban and industrial wastes. E Waste Management: Sources and Types of E-waste. Effect of E waste on environment and human body. Disposal of E-waste, Advantages of Recycling E -waste. Role of an individual in prevention of pollution. Disaster management: floods, earthquake, cyclone and landslides.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Social Issues and the Environment Water conservation, rain water harvesting, water shed management. Climate change, global warming, acid rain, ozone layer depletion, Waste and reclamation.</p> <p>Environment Protection Act Wild life Protection Act. Forest Conservation Act. Population explosion–Family Welfare Programmes Human Rights-Value Education. HIV/ AIDS- Women and Child Welfare. Role of Information Technology in Environment and human health.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination) Global warming – climate change – importance of ozone – Effects of ozone depletion. Biogeography – history, ecology and conservation. International laws and policy</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References

1. Beard, J.M. 2013. Environmental Chemistry in Society (2nd edition). CRC Press.
2. Girard, J. 2013. Principles of Environmental Chemistry (3rd edition). Jones & Bartlett.
3. Brebbia, C.A. 2013. Water Resources Management VII. WIT Press.
4. Pandit, M.K. & Kumar, V. 2013. Land use and conservation challenges in Himalaya: Past, present and future. In: Sodhi, N.S., Gibson, L. & Raven, P.H. Conservation Biology: Voices from the Tropics. pp. 123-133. Wiley-Blackwell, Oxford, UK
(file:///Users/mkpanidit/Downloads/Raven%20et%20al.%202013.%20CB%20Voices%20from%20Tropics%20(2).pdf)
5. Hites, R.A. 2012. Elements of Environmental Chemistry (2nd edition). Wiley & Sons.
6. Harnung, S.E. & Johnson, M.S. 2012. Chemistry and the Environment. Cambridge University Press.
7. Boeker, E. & Grondelle, R. 2011. Environmental Physics: Sustainable Energy and Climate Change.
8. Wiley. Forinash, K. 2010. Foundation of Environmental Physics. Island Press.
9. Evans, G.G. & Furlong, J. 2010. Environmental Biotechnology: Theory and Application (2nd edition). Wiley-Blackwell Publications.
10. Williams, D. M., Ebach, M.C. 2008. Foundations of Systematic and Biogeography. Springer
11. Pani, B. 2007. Textbook of Environmental Chemistry. IK international Publishing House.
12. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. B. Thamilmalai Selvi

Ability Enhancement Compulsory Course II (AECC) : Environmental Studies
(22UGEV5) Assessment Rubrics for 100 Marks

1. Documentary (or) Poster Presentation (or) Elocution-25 Marks
2. Quiz (or) MCQ Test-25 Marks
3. Album Making (or) Case study on a topic (or) Field Visit -25 Marks
4. Essay Writing (or) Assignment (Minimum 10 pages) -25 Marks

There will be no End Semester Examination for this course. However, the subject teacher will evaluate the above-mentioned components based on the performance of the students and submit the marks out of 100 (in the format to be supplied by the COE) with the approval of the concerned Head of the Department to the COE along with CIA marks of other courses.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NAAC Accreditation III Cycle: A Grade

(CGPA 3.41 out of 4)

**ISO 9001: 2015 Certified by IRCLASS & Accredited by
NABCB**

PG & RESEARCH DEPARTMENT OF COMMERCE



2021 - 2024

B.Com.

Syllabus

The bachelor of commerce aims to provide students with the knowledge, tools of analysis and skills with which to understand and participate in the modern business and economic scenario, to prepare them for subsequent graduate studies and achieve success in their professional careers.

PROGRAMME OUTCOMES

- PO1** – Acquire a strong foundation of knowledge in the areas of Commerce, Finance and Management that needs to respond to the constantly changing economic and legal environment.
- PO2** – Focus on specific streams which enable to work effectively and efficiently in Business Scenario.
- PO3** – Build the skill of applying the concepts and techniques used in Modern Trade Practices necessary for decision making process.
- PO4** – Imbibe professionalism to face the modern day challenges in Commerce through value based and job oriented courses.
- PO5** – Integrate knowledge, skill and attitude that will sustain an environment of learning and creativity which enhance the career prospects.

PROGRAMME SPECIFIC OUTCOMES

- PSO1:** To build a strong foundation of knowledge in different areas of Commerce
- PSO2:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students in order to expose their entrepreneurship.
- PSO3:** Students will exhibit inclination towards pursuing professional courses such as CA/CS/CMA/CFA etc.



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE
B.Com.– PROGRAMME STRUCTURE
(For the candidates admitted from the academic year 2021 – 2022 onwards)

I Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total									
								Internal	External										
I	I	Language Course - I (LC)	ஐஐஐஐஐஐ ஐஐஐஐஐஐஐஐஐஐஐஐ	19ULT1	6	3	3	25	75	100									
			Story, Novel, Hindi Literature - I & Grammar - I	19ULH1															
			Communication in French-I	19ULF1															
			History of Popular Tales Literature and Sanskrit Story	19ULS1															
	II	English Language Course - I (ELC)	Functional Grammar for Effective Communication - I	19UE1	6	3	3	25	75	100									
	III	Core Course - I (CC)	Financial Accounting - I	19UCO1CC1	6	5	3	25	75	100									
											Core Course - II (CC)	Management Principles and Application	19UCO1CC2	6	5	3	25	75	100
											Allied Course - I (AC)	Business Economics - I	19UCO1AC1	4	3	3	25	75	100
	IV	UGC – JeevanKaushal Life Skills	Universal Human Values	20UGVE	2	2	3	25	75	100									
	Total					30	21				600								



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B.Com.– PROGRAMME STRUCTURE
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II Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
II	I	Language Course - II (LC)	செய்யும்படி செய்து கொடுக்கப்பட்டது செய்யும்படி	19ULT2	6	3	3	25	75	100
			Prose,Drama,Hindi Literature-2 & Grammar-II	19ULF2						
			Communication in French-II	19ULS2						
			Poetry Textual Grammar and Alankara	19ULH2						
	II	English Language Course - II (ELC)	Functional Grammar for Effective Communication - II	19UE2	6	3	3	25	75	100
	III	Core Course - III (CC)	Financial Accounting - II	19UCO2CC3	6	5	3	25	75	100
		Core Course - IV(CC)	Fundamentals of Marketing	19UCO2CC4	6	5	3	25	75	100
		Allied Course - II (AC)	Business Economics - II	19UCO2AC2	4	3	3	25	75	100
	IV		Environmental Studies	21UGES	2	2	3	25	75	100
	Total					30	21			



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III Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
III	I	Language Course - III (LC)	ஊழிமலர் ஊழிமலர்	19ULT3	6	3	3	25	75	100	
			Medieval, Modern Poetry & History of Hindi Literature-3	19ULH3							
			Communication in French-III	19ULF3							
			Prose, Textual Grammar and Vakyaarachana	19ULS3							
	II	English Language Course III (ELC)	Reading and Writing for Effective Communication - I	19UE3	6	3	3	25	75	100	
	III	Core Course - V (CC)	Core Course - V (CC)	Cost Accounting	19UCO3CC5	6	5	3	25	75	100
				Banking Theory Law & Practices	19UCO3CC6	6	5	3	25	75	100
				Business Statistics	21UCO3AC3	4	3	3	25	75	100
	IV	Non-Major Elective - I		Elements of Insurance	19UCO3NME1	2	2	3	25	75	100
				Basic Tamil	19ULC3BT1						
Special Tamil				19ULC3ST1							
	Extra Credit Course	Swayam Online Course		As per UGC norms							
	Total				30	21				600	



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IV Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
IV	I	Language Course - IV (LC)	□□□□□□ □□□□□□□□□□	19ULT4	6	3	3	25	75	100
			Letter writing, General Essays, Technical Terms, Proverbs, Idioms & Phrases, Hindi Literature-4	19ULH4						
			Communication in French-IV	19ULF4						
			Drama, History of Drama Literature	19ULS4						
	II	English Language Course-IV (ELC)	Reading and Writing for Effective Communication - II	19UE4	6	3	3	25	75	100
	III	Core Course - VII (CC)	Management Accounting	21UCO4CC7	5	5	3	25	75	100
		Core Practical - I (CP)	Accounting Package - Practical	21UCO4CC1P	5	5	3	40	60	100
		Allied Course - IV (AC)	Business Law	19UCO4AC4	4	3	3	25	75	100
	IV	Non Major Elective - II	Advertisement Management	19UCO4NME2	2	2	3	25	75	100
			Basic Tamil	19ULC4BT2						
			Special Tamil	19ULC4ST2						
		Skill Based Elective - I	A. Introduction to MS-Word (Practical)	21UCO4SBE1AP	2	2	3	40	60	100
	B. Creative Advertising(Practical)		21UCO4SBE1BP							
	Extra Credit Course		Swayam Online Course		As per UGC norms					
Total				30	23					700



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V Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
V	III	Core Course - VIII (CC)	Corporate Accounting	19UCO5CC8	6	5	3	25	75	100	
		Core Course - IX (CC)	Auditing	19UCO5CC9	5	5	3	25	75	100	
		Core Course - X (CC)	Business Correspondence & Reporting	21UCO5CC10	5	5	3	25	75	100	
		Core Course - XI (CC)	Entrepreneurship and Small Business Management	21UCO5CC11	4	4	3	25	75	100	
		Major Based Elective - I	A. GST	21UCO5MBE1A	4	4	3	25	75	75	100
	B. E - Commerce		21UCO5MBE1B								
	IV	Skill Based Elective - II	A. Introduction to MS- Excel and Power point (Practical)	21UCO5SBE2AP	2	2	3	40	60	100	
			B. Digital Designs for Business Application (Practical)	21UCO5SBE2BP							
		Skill Based Elective - III	A. Commerce - Practical	21UCO5SBE3AP	2	2	3	40	60	100	
			B. Skills for Competitive Examination	19UCO5SBE3B				-	100		
		UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100	
	Extra Credit Course	Swayam Online Course		As per UGC norms							
	Total				30	29					800



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VI Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
VI	III	Core Course - XII (CC)	Direct Taxation	21UCO6CC12	6	5	3	25	75	100
		Core Course - XIII (CC)	Financial Management	21UCO6CC13	6	5	3	25	75	100
		Major Based Elective II	A. Company Law and Secretarial Practice	21UCO6MBE2A	5	4	3	25	75	100
			B. Human Resource Management	21UCO6MBE2B						
		Major Based Elective - III	A. Corporate Governance	21UCO6MBE3A	6	4	3	25	75	100
			B. Financial Services	21UCO6MBE3B						
		Project	Project Work	21UCO6PW	6	5	3	-	100	100
	V		Gender Studies	19UGGS	1	1	3	25	75	100
			Extension Activities	19UGEA	-	1	-	-	-	-
	Total					30	25			
Grand Total					180	140				3900

CORE COURSE – I
FINANCIAL ACCOUNTING - I
2019 – 2020 Onwards

Semester - I	Financial Accounting - I	Hours/Week - 6	
Core Course - I		Credits - 5	
Course Code - 19UCO1CC1		Internal 25	External 75

Course Objective

- To gain fundamental knowledge on Accounting Concepts and Principles.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Recall the fundamental concepts of accounting and its importance	K1
CO2	Extend the accounting concepts to prepare Final Accounts and Bank Reconciliation Statement	K2
CO3	Develop the accounting techniques applicable to frame Non-Profit Organizational Statement	K3
CO4	Summarize the methods of Single Entry and Double Entry System of Book Keeping	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	S	S	S	M	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Accountancy

(18 Hours)

Meaning and Definition of Accounting – Functions of Accounting – Limitations of Accounting – Accounting Concepts and Conventions – Accounting Standards – Double Entry System – Journal, Ledger, Trial Balance – Subsidiary Books including Cash Book – Rectification of Errors.

Unit – II Final Accounts

(18 Hours)

Final Accounts with Adjustments – Bank Reconciliation Statement.

Unit – III Non-Profit Organization & Bills of Exchange**(18 Hours)**

Accounts of Non-Profit Organization – Average Due Date – Account Current – Bills of Exchange.

Unit – IV Consignment & Joint Venture**(18 Hours)**

Consignment Accounts – Features – Difference between Consignment and Sale – Accounting Treatment in the Books of Consignor and Consignee – Joint Venture – Distinctions between Joint Venture and Partnership – Distinction between Joint Venture and Consignment – Methods.

Unit – V Single Entry System & Depreciation**(18 Hours)**

Single Entry System – Ascertainment of Profit – Net worth Method – Conversion Method (simple problems only) Depreciation - Methods, Provisions and Reserves.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	T.S.Reddy&A.Murthy	Financial Accounting	Margham Publications	Sixth Revision Edition, 2011
2.	Jain S.P and Narang K.L	Principles of Accountancy	Kalyani Publishers	2014
3.	Dalston L cecil and Jenitra L Merwin	Principles of Accountancy	Learn Tech Publishers	2010

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Assish K. Bhattacharyya	Financial Accounting	Prentice of hall of India	2002
2.	N. Vinayagam and B. Charumaki	Financial Accounting	S.Chand& Company Ltd	2002, Reprint – 2008.
3.	P.C. Tulsian	Financial Accounting	Tata MC Graw Hill Ltd	2003

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz & Group Discussion.

Course Designer

Ms. G. Kanagavalli – Assistant Professor, Department of Commerce.

CORE COURSE – II

MANAGEMENT PRINCIPLES & APPLICATION

2019 – 2020 Onwards

Semester - I	Management Principles & Application	Hours/Week – 6	
Core Course - II		Credits –5	
Course Code - 19UCO1CC2		Internal 25	External 75

Course Objective

- To familiarize the students on the basic concepts of management in order to aid in understanding how an organization functions and the challenging issues a manager confronts in today's business firm.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	List the essential principles required for an effective management	K1
CO2	Outline the functions of management	K2
CO3	Identify the competent skills essential for business decision making and problem solving	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	S
CO2	S	S	S	M	S
CO3	S	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction

(18 Hours)

Management – Meaning – Definition – Nature and Scope - Functions, Skills of a Manager, Process of Management, Development of Scientific Management – Contribution of Henry Fayol and F.W. Taylor - George Elton Mayo – Douglas McGregor – Renisik Likert – Mary Parker Follett – Chester I Barnard – Chris Argyris – Herbert A Simon – Peter F. Drucker.

Unit – II Planning

(18 Hours)

Nature and Purpose of Planning – Planning Process – Types of Plans – Objectives – Management by Objectives (MBO) – Strategies – Types of Strategies – Policies – Decision Making – Types of Decision – Decision Making Process – Rational Decision Making Process – Decision Making Under Different Conditions.

Unit – III Organizing**(18 Hours)**

Nature and Purpose of Organizing – Organization Structure – Line and Staff Authority – Departmentation – Span of Control – Centralization and Decentralization – Delegation of Authority – Staffing – Selection and Recruitment – Career Development – Career Stages – Training – Performance Appraisal.

Unit – IV Motivation & Communication**(18 Hours)**

Motivation – Types – Theories – Maslow, Herzberg, McGregor and others – Communication – Principles – Types and Barriers of Communication.

Unit – V Leadership, Co-ordination & Control**(18 Hours)**

Leadership – Functions – Styles – Theories – Co-ordination – Features – Types and Techniques – Control – Process – Effective Control System – Techniques of Control.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	L.M.Prasad	Principles and Practice of Management	Sultan Chand & Sons	2000
2.	Peter Drucker.F, Butterworth Heinemann	Management Challenges	Oxford	2008

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Andrew J. Dubrin	Essentials of Management	Thomson Southwestern, 9th edition.	2012
2.	Samuel C. Certo and Tervis Certo	Modern management: concepts and skills	Pearson education, 12th edition	2012
3.	Dinkar Pagar	Principles of Management	Sultan Chand & sons	2010

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Activity, Brain Storming & Group Discussion.

Course Designer

Ms. B. Lavanya – Assistant Professor, Department of Commerce.

ALLIED COURSE – I
BUSINESS ECONOMICS - I
2019 – 2020 Onwards

Semester - I	Business Economics - I	Hours/Week –4	
Allied Course - I		Credits –3	
Course Code - 19UCO1AC1		Internal 25	External 75

Course Objective

- Enable the students' to interpret the demand function and elasticity interlinked with optimal pricing decisions and recognize different market structures.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Recall the concept of Micro and Macro economics	K1
CO2	Explain the demand, supply and production function	K2
CO3	Identify demand forecasting methods and the application of cost techniques	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	S
CO2	S	S	S	M	S
CO3	S	S	S	S	S

Syllabus

Unit – I Business Economics (12 Hours)

Meaning – Definitions - Characteristics – Distinction between Business Economics and Economics – Scope – Objectives – Role and responsibilities of business economist – Micro & Macro economics.

Unit – II Theory of Demand Analysis (12 Hours)

Demand – Demand determinants – Law of demand – Characteristics – Exceptions – Elasticity of demand – Price elasticity – Types – Determining factors – Change in demand and Elasticity of demand – Business applications of price elasticity – Concepts of income and cross elasticity of demand – Price elasticity of demand - Measurement of price elasticity of demand.

Unit – III Demand Forecasting Methods (12 Hours)

Survey of buyer's intention – Collective opinion – Trend projection – Economic indicator, Demand forecasting methods for a new product.

Unit – IV Production Function**(12 Hours)**

Law of supply – Meaning – Determinants of supply, production function : equilibrium through iso quant's and iso costs – Managerial uses of production function – Law of variable proportions – Economies and diseconomies of large scale production.

Unit – V Cost & Revenue Analysis**(12 Hours)**

Cost classification – Real cost – Opportunity cost – Money cost – Explicit cost and implicit cost – Economic cost – Fixed cost and Variable cost – Total and Marginal cost – Behavior of short run and long run cost – Cost and output relations – Revenue concepts – Break Even Analysis – Profit Management – Nature, Theories and Measurement.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	D. M. Mithani	Economics for Managers	Himalaya Publication	2010

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Ahuja H.L	Business Economics	Sultan Chand & Sons	2016
2.	D.D Chaturvedi & S.L. Gupta	Business Economics	Vikas Publication	2010

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Brain Storming, Activity & Group Discussion.

Course Designer

Dr. P. Kavitha – Associate Professor, Department of Commerce.



CAUVERY COLLEGE FOR WOMEN (Autonomous), TIRUCHIRAPPALLI- 18

Applicable to the candidates admitted from the Academic year 2020-21 onwards

Part IV - UNIVERSAL HUMAN VALUES

Hours: 2

Course Code: 20UGVE

Credit: 2

Instructional Hours: 30

Semester	Course title	Category	Instructional Hours	Credits
I	Universal Human Values	Part IV	30	2

Course Objective

- This course inculcates the basic human values among the students so as to make them responsible citizens of the Nation.

Course Outcomes

On successful completion of the course the students will be able to

CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth	K2
CO3	Explain the value of Non-violence	K3
CO4	Practice the values of Righteousness and Service	K3
CO5	Apply the values of Renunciation (sacrifice) & Peace	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	S
CO2	M	M	M	M	S
CO3	M	M	M	M	S
CO4	M	M	M	M	S
CO5	M	M	M	M	S

S – Strong; M – Medium; L – Low

Syllabus

Unit - I Love and Compassion

(5 Hours)

- **Introduction:** what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore
- Practicing love and compassion: what will learners learn gain if they practice love and compassion? What will learners lose if they Don't Practice love and compassion?
- Sharing learner's individual and/ or group experience(s)

- Simulated situations
- Case studies

Unit - II Truth

(5 Hours)

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity, sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- Practicing truth: what will learners learn/ gain if they practice truth? What will learners lose if there Don't Practice it?
- Learners' individual and/ or group experience(s)
- Simulated situations
- Case studies

Unit - III Non – Violence

(5 Hours)

- **Introduction:** what is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore
- Practicing non-violence: What will learners learn/gain if they practice non- violence? What will learners lose if they don't Practice it?
- Sharing learner's individual and/ or group experience(s) about non - violence
- Simulated situations
- Case studies

Unit - IV Righteousness and Service

(8 Hours)

- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore
- Practicing Righteousness: What will learners learn/ gain if they practice righteousness and service? What will learners loose if they Don't Practice these values?
- Sharing learners individual and/ or group experience(s) regarding righteousness and service
- Simulated situations
- Case studies

Unit – V Renunciation (sacrifice) & Peace

(7 Hours)

- Introduction: what is renunciation? Renunciation and sacrifice. Self - restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace
- Practicing renunciation, sacrifice and Peace: What will learners learn/ again if they practice Renunciation, sacrifice and Peace? What will learners lose if there Don't Practice these values?
- Sharing learners individual and/ or group experience(s) about Renunciation, sacrifice and Peace
- Simulated situations
- Case Studies

CORE COURSE – III
FINANCIAL ACCOUNTING - II
2019 – 2020 Onwards

Semester - II	Financial Accounting - II	Hours/Week –6	
Core Course - III		Credits –5	
Course Code - 19UCO2CC3		Internal 25	External 75

Course Objective

- To enable the student to apply the financial accounting principles and its application in business.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Understanding the accounting principles adopted in a partnership firm	K1
CO2	Explain the methods of dissolution of the partnership firm	K2
CO3	Prepare the financial statements of Branch accounts and Departmental Accounts	K3
CO4	Infer the accounting procedures related to Fire Insurance claim, Hire Purchase, Instalment Accounting and Royalty Accounts	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	M	M
CO3	S	S	S	S	S
CO4	S	S	S	S	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Branch Account & Departmental Accounts (18 Hours)

Branch Accounts – Dependent Branch – Debtor system – Stock & Debtor System – Final Accounts System – Wholesale Branches – Independent Branches (Excluding Foreign Branches) – Departmental Accounts.

Unit – II Hire Purchase Accounts & Instalment Accounts (18 Hours)

Hire Purchase Accounts – Default and Repossession – Hire Purchase Trading Account – Instalment Purchase System.

Unit – III Partnership Accounts**(18 Hours)**

Admission of a Partner – Retirement of a Partner – Death of a Partner.

Unit – IV Dissolution of Firm**(18 Hours)**

Dissolution of firm – Insolvency of Partner – Insolvency of all Partners – Garner vs. Murray – Gradual realization of assets and Piecemeal Distribution.

Unit – V Insurance Claims & Royalty Accounts**(18 Hours)**

Insurance Claims for Loss of Stock and Profit – Royalty Accounts.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	T.S.Reddy&A.Murthy	Financial Accounting	Margham Publications	Sixth Revision Edition, 2011
2.	Jain S.P and Narang K.L	Financial Accounting	Kalyani Publishers	2016

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	R.L. Gupta	Advanced Accountancy	Sultan Chand Sons	2010
2.	Arulanandam	Advanced Accountancy	Himalaya Publications	2012

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Brain Storming& Group Discussion.

Course Designer

Dr. S. Sudha – Associate Professor, Department of Commerce.

CORE COURSE – IV
FUNDAMENTALS OF MARKETING
2019 – 2020 Onwards

Semester - II	Fundamentals of Marketing	Hours/Week - 6	
Core Course - IV		Credits - 5	
Course Code - 19UCO2CC4		Internal 25	External 75

Course Objective

- To enable the learners to understand core concepts of marketing and develop the knowledge of overall marketing programme.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Recall the functions of marketing	K1
CO2	Extend the knowledge on consumer behaviour and market segmentation along with product and pricing methods	K2
CO3	Identify the various channels of distribution applicable in modern marketing practices	K3
CO4	Analyse the recent trends in E-marketing	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction (18 Hours)

Market - Meaning, Evolution, Classification of Markets – Marketing – Meaning – Definition – Features – Functions – Approaches – Role and importance of Marketing – 7P's of Marketing.

Unit – II Consumer Behaviour & Market Segmentation (18 Hours)

Introduction to Consumer Behaviour – Need for study – Consumer buying decision process – 7 O's frame work – Factors – Buying motives – Market Segmentation – Concepts – Benefits – Methods of segmenting of market – Criteria for successful segmentation.

Unit – III Product & Pricing**(18 Hours)**

Product – Meaning – Product Policy – New Product Planning and Development – Introduction to Product Life Cycle – Product Mix – Branding – Brand Loyalty, Equity - Packaging – Price – Pricing Policies – Methods of Pricing.

Unit – IV Channels of Distribution & Promotional Programme**(18 Hours)**

Channels of Distribution – Importance – Factors affecting choice of Distribution of Channel – Channel Members – Promotional Programme – Sales Promotion – Advertising – Personal Selling.

Unit – V Recent Trends in E-Marketing**(18 Hours)**

E-Marketing – Relationship Marketing – Word of mouth Marketing – Green Marketing – Guerilla Marketing – Digital Marketing – Social Media Marketing.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	R.S.N.Pillai &V. Bagavathi	Modern Marketing	S.Chand& Co	2010
2.	N RajanNair ,Sanjith R Nair	Marketing	Sultan Chand & Sons	2015

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dhruv Grewal	Marketing	Tata Mc Graw Hill India	2018
2.	Philip Kotler	Marketing Management	Sultan Chand & Sons	2015
3.	S.A.Sherlekar ,R.Krishnamoorthy	Marketing Management	Himalaya Publishing House	2010

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Ms. B. Lavanya – Assistant Professor, Department of Commerce.

ALLIED COURSE – II
BUSINESS ECONOMICS - II
2019 – 2020 Onwards

Semester - II	Business Economics - II	Hours/Week - 4	
Allied Course - II		Credits - 3	
Course Code - 19UCO2AC2		Internal 25	External 75

Course Objective

- Students will understand the phases of Trade and Business comprising of different market structures and Pricing Strategies.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the features of market, price and output determination	K1
CO2	Outline the factors involved in pricing decisions and infer on the implications of both monetary and fiscal policies	K2
CO3	Identify the measures to control business cycle	K3
CO4	Analyze the recent techniques of agricultural and industrial Programmes and Policy that impact on Globalization and Trade	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Pricing & Monetary Policy (12 Hours)

Pricing policy – General considerations – Objectives – Factors involved in pricing policy – methods of pricing - Monetary policy – Methods and implications – Fiscal policy – Measures – Implications – Inflation – Types – Causes – Measurers.

Unit – II Business Cycles (12 Hours)

Business cycles – Phases of business cycle – Effects of business cycle – Measures to control the business cycle – Theories of business cycles – Multiplier and accelerator theory – Keynesian theory.

Unit – III Balance of Trade & Balance of Payments**(12 Hours)**

Balance of Trade and Balance of Payments – Components of Balance of Payments – Disequilibrium in the Balance of Payments – Methods of correction of disequilibrium – India’s Balance of Payments crisis.

Unit – IV Agricultural & Industrial Sectors**(12 Hours)**

Nature and importance of agriculture – Factors influencing agricultural development - Agricultural production and productivity - New agricultural policy – Green revolution - Issues in food security - Farmers suicide – Role of Governments for agricultural sector development. Industrial development under Five Year Plans - New Industrial policy – Position of public sector enterprises - Labour market reform – Make in India Programme.

Unit – V Globalization & Trade**(12 Hours)**

Directions and composition of Foreign Trade – Balance of Trade and Payments – Current account deficit –India’s Foreign Trade Policy – WTO – Features and assessment – Globalization - Features and problems - Sectoral contribution Trade – Import substitution and Export promotion – Foreign Direct Investment (FDI) and MNCs.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	D. M. Mithani	Economics for Managers	Himalaya Publication	2010

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Ahuja H.L	Business Economics	Sultan Chand & Sons	2016
2.	D.D Chaturvedi & S.L. Gupta	Business Economics	Vikas Publication	2010
3.	Agarwal. A.N.	Indian Economy	WishwaPrakashan, New Delhi	2004
4.	Jhingan.M.L.	The Economic of Development and Planning	Vikas Publishing House Pvt.Ltd, New Delhi.	2010

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Brain Storming& Group Discussion.

Course Designer

Dr. P. Kavitha – Associate Professor, Department of Commerce.



CAUVERY COLLEGE FOR WOMEN (Autonomous), TIRUCHIRAPPALLI- 18
(Applicable to the candidates admitted from the Academic year 2021-22 onwards)

ENVIRONMENTAL STUDIES

Hours: 2
Course Code: 21UGES

Credit: 2
Instructional Hours: 30

SEMESTER	COURSE TITLE	CATEGORY	INSTRUCTIONAL HOURS	CREDITS
II	Environmental Studies	PART IV	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Outline the nature and scope of environmental studies	K2
CO2	Illustrate the various types of natural resources and its importance	K2
CO3	Classification of various types of ecosystems with its structure and function	K2
CO4	Develop an understanding of various types of pollution and biodiversity	K3
CO5	List out the various types of social issues related with environment	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	M	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong; M – Medium; L – Low

Unit: I Introduction to environmental studies (6 Hours)
Definition, scope and importance. Need for public awareness

Unit: II Natural Resources: (6 Hours)

Renewable and non-renewable resources:

- a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.
- e) Land resources: Land as a resource, land degradation, man induced Landslides, soil erosion and desertification.

Role of an individual in the conservation of natural resources.

Unit: III Ecosystems (6 Hours)

- Concept, Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem and Ecological succession.
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

Unit: IV Biodiversity and Environmental Pollution (6 Hours)

- Introduction, types and value of biodiversity
- India as a mega diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Definition, Causes, effects and control measures of :
 - a. Air Pollution
 - b. Water Pollution
 - c. Soil Pollution
 - d. Noise pollution
 - e. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Disaster management: floods, earthquake, cyclone and landslides.

Unit: V Social Issues and the Environment (6 Hours)

- Water conservation, rain water harvesting, watershed management.
- Climate change, global warming, acid rain, ozone layer depletion,
- Wasteland reclamation.
- Environment Protection Act
- Wildlife Protection Act.
- Forest Conservation Act.
- Population explosion – Family Welfare Programmes
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
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7. Down to Earth, Centre for Science and Environment (R)
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9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
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11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
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15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p

CORE COURSE – V
COST ACCOUNTING
2019 – 2020 Onwards

Semester - III	Cost Accounting	Hours/Week - 6	
Core Course - V		Credits - 5	
Course Code - 19UCO3CC5		Internal 25	External 75

Course Objectives

- To make aware about cost structure and cost elements.
- To understand various techniques and methods of cost accounting.
- To understand classification of overheads & methods of absorption.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the conceptual framework of Cost Accounting	K1
CO2	Illustrate the various types in estimating the Material and Labour Cost	K2
CO3	Identify the various methods of overheads allocation and to prepare reconciliation statement	K3
CO4	Analyse the cost structure with various methods of costing for managerial decisions	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	S	S	S
CO3	S	S	S	M	M
CO4	S	S	S	S	S

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Introduction of Cost Accounting (18 Hours)

Cost Accounting – Meaning – Definition – Evolution - Difference between Cost Accounting and Management Accounting – Cost Concepts – Classifications – Objectives – Importance – Advantages and Disadvantages of Cost Accounting – Methods and Techniques – Cost Units – Cost Centers – Cost Sheet - Tender and Quotations.

Unit – II Material Cost (18 Hours)

Material – Purchase and Stores Control – Bin Card – Stores Ledger – Material Control Techniques – Levels – EOQ – VED Analysis – ABC Analysis – JIT – FNSD Analysis – Perpetual Inventory System – Material Turnover Ratio – Material Cost Reports – Methods of Valuing

Material Issues – FIFO – LIFO – Simple Average - Weighted Average – Standard Price Method – HIFO – Base Stock Method.

Unit – III Labour Cost (18 Hours)

Labour Cost – Methods of Remuneration and Incentive System – Payroll Procedures – Labour Analysis and Idle Time – Measurement of Labour Efficiency and Productivity – Labour Turnover and Remedial Measures – Treatment of Idle Time and Over Time.

Unit – IV Overheads and Reconciliation of Cost & Financial Accounts (18 Hours)

Overheads – Definition – Importance – Classification – Allocation of Overhead Expenses – Apportionment of Overhead Expenses – Under Absorption and Over Absorption of Overheads – Reconciliation of Cost and Financial Accounts – Need and Methods of Reconciliation.

Unit – V Job Costing (18 Hours)

Job costing – Contract costing – Process costing (Normal Loss, Abnormal Loss and Gains) – Operating costing.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Jain & Narang	Cost Accounting	Kalyani Publications	2015

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.N. Maheswari	Cost Accounting	Sultan Chand & Sons	2017
2.	Pillai & Bhagavathi	Cost Accounting	Sultan Chand & Sons	2016
3.	Reddy T.S & Hari Prasad Reddy Y	Cost Accounting	Margham Publications	2018

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Group Discussion.

Course Designer

Ms. J. Lalithambigai – Assistant Professor, Department of Commerce.

CORE COURSE – VI

BANKING THEORY LAW & PRACTICES

2019 – 2020 Onwards

Semester - III	Banking Theory Law & Practices	Hours/Week - 6	
Core Course - VI		Credits - 5	
Course Code - 19UCO3CC6		Internal 25	External 75

Course Objectives

- To acquaint the students with the fundamentals of banking.
- To make the students aware of banking business and practices.
- To enlighten the students regarding the new concepts introduced in the banking system.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	List out the concepts of Banking Regulation Act, functions of commercial banks and its role in economic development	K1
CO2	Identify the functions of product and services offered in a banking sector	K2
CO3	Build knowledge about the various electronic payment methods	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	S	S
CO3	S	S	M	S	S

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Introduction (18 Hours)

Banking – Meaning – Definition – Banking Regulation Act, 1949 – Functions of Commercial Banks – Nationalization and Privatization of banks in India – Role of banks in Economic Development.

Unit – II Central Banking & Types of Accounts (18 Hours)

Central Banking – Meaning – Functions of RBI – Definition of banker and Customer – General Relationship – Rights and Obligations of a banker – Ombudsman scheme -Who can be a customer – Various types of account – Types of Deposits – General precautions for opening Accounts – KYC Norms.

Unit – III Negotiable Instruments**(18 Hours)**

Negotiable Instruments Act – Definition - Types of Negotiable Instruments – Endorsement – Meaning, Definition and Kinds - Cheques – Crossing of Cheques – Types – Payment and collection of Cheques – Precautions by Paying Banker - Legal status – Truncated cheques and e-cheques.

Unit – IV Loans & Advances**(18 Hours)**

Loans and Advances – Principles of sound lending – Types of loans & Advances – Lien, Mortgage, Pledge and Hypothecation – General principles of secured advances – Advances against goods and document of title of goods.

Unit – V E - Banking**(18 Hours)**

E – Banking – Electronic Delivery channels – Credit Cards – Debit Cards – ATM –Internet Banking – E- Banking transactions – Mobile banking – Inter Bank Mobile Payment (IMPs) – Virtual Currency – Model of E-banking – Advantages – Constraints – Security measures – Electronic Payment System (EPS) – NEFT, RTGS, SWIFT, WIRE.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Sundaram & Varshney	Banking Theory Law & Practice	Sultan Chand & Sons	20 th Revised Edition 2014

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dr. S. Gurusamy	Banking Theory Law & Practice	Vijay Nicole Imprints(p) Ltd	4 th Edition 2016
2.	E.Gorden and K.Natarajan	Banking Theory Law & Practice	Himalaya Publishing House	26 th Revised Edition 2017
3.	Kandasami. K.P	Banking Theory Law & Practice	Sultan Chand & Company	Revised Edition 2010

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Dr. D. Sarala – Assistant Professor, Department of Commerce.

ALLIED COURSE – IV
BUSINESS STATISTICS
2019 – 2020 Onwards

Semester - III	Business Statistics	Hours/Week –4	
Allied Course - IV		Credits –3	
Course Code - 21UCO3AC3		Internal 25	External 75

Course Objective

- To estimate mean and standard deviation of the marginal distribution of the response variable and use this information to inform a business decision.
- To obtain an interval estimate for the mean of the conditional distribution of the response variable given a value for the predictor and use this information to inform a business decision.
- To construct a prediction interval for the slope of the regression line.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the fundamental concept of Measures of Central Tendency	K1
CO2	Compute various coefficients to measure Dispersion and Skewness	K2
CO3	Applying the good knowledge of probability helps to make sense of uncertainties	K3
CO4	Predict the cause accruing when price level changes	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	S	M	M
CO3	M	M	S	S	S
CO4	M	M	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction (10 Hours)

Introduction – Meaning - Definition – Functions - Importance, Scope, Merits & demerits of statistics. Sampling – Meaning, Definition, Methods of Sampling – Collection of data – Tabulation of data – Diagrammatic and Graphic representation of data.

Unit – II Measures of Central Tendency (14 Hours)

Mathematical Averages – Arithmetic Mean – Direct method, Short-cut method, Step Deviation method – Geometric Mean – Harmonic Mean – Corrected Mean – Combined Mean – Positional Averages – Median, Quartiles, Deciles and Percentiles – Mode.

Unit – III Measures of Dispersion, Correlation & Regression (16 Hours)

Range – Quartile Deviation – Mean Deviation – Standard Deviation: Actual Mean Method, Assumed Mean Method, Combined Standard Deviation, Corrected Standard Deviation – Co-efficient of Variation – Comparison of Measures of Dispersion – Lorenz curve.

Correlation – Definition - Karl Pearson's co-efficient of Correlation – Spearman Rank Correlation – Concurrent deviation. Regression – Definition – Regression Equation – Linear Regression – Difference between Regression and Correlation.

Unit – IV Analysis of Time Series (10 Hours)

Elements of Time Series – Secular Trend: Graphic Method, Method of Semi-Averages, Method of Moving Averages, Method of Least Squares. Seasonal Fluctuations: Method of Simple Averages, Method of Moving Averages, Ratio to Trend Method, Method of link relatives, Cyclical Fluctuation, Random Fluctuation.

Unit – V Index Numbers (10 Hours)

Index Numbers – Definition, Simple Index Number and Weighted Index Number: Laspeyre's formula, Paache's formula, Fisher's formula, Marshal Edge-worth formula, Bowley's formula, Kelly's formula – Mathematical test of consistency: Time Reversal Test, Factor Reversal Test – Fixed Index Number – Chain Index Number – Cost of Living Index.

Distribution of Marks: Theory 25% & Problem 75%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.P. Gupta	Statistical Method	Sultan Chand & Sons	33 rd revised edition, 2005
2.	R.S.N.Pillai & Bagavathy	Statistics : Theory & Practice	Sultan Chand & Sons	2010
3.	P.R Vital	Business Statistics	Margam Publications	2001

Reference

S. No.	Authors	Title	Publishers	Year of Publication
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1.	Ajai S. Gaur & Sanjaya S. Gaur	Statistical Methods for Practice and Research - A Guide to Data Analysis Using SPSS	SAGE Publications Pvt. Ltd.	2009
2.	Vijaya Krishnan & Sivathanu Pillai	Statistics for Beginners	AtlanticBooks	2011
3.	EelkoHuizingh	Applied Statistics with SPSS	SAGE Publications Pvt., Ltd.	2007

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Dr. P. Kavitha – Associate Professor, Department of Commerce.

NON-MAJOR ELECTIVE – I
ELEMENTS OF INSURANCE
2019 – 2020 Onwards

Semester – III	Elements of Insurance	Hours/Week -2	
Non-Major Elective-I		Credits - 2	
Course Code - 19UCO3NME1		Internal 25	External 75

Course Objectives

- To understand the concept and scope of insurance.
- To implant the concept of general insurance principles and practices of insurance.
- To understand the risk and various insurance policies along with their structures and the legal dimensions involved.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the conceptual framework of Insurance.	K1
CO2	Explain the features and procedures of various types of Insurance policies	K2
CO3	Identify the methods of premium calculation related to different schemes.	K3
CO4	Analyse the latest trends and challenges in Insurance	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M
CO2	S	S	S	M	M
CO3	S	S	S	M	M
CO4	S	S	M	M	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Insurance (6 Hours)

Introduction to Insurance: Purpose and Need of Insurance – Insurance as a Social Security Tool – Insurance and Economic Development – Types of Insurance.

Unit – II Procedure for becoming an Agent (6 Hours)

Procedure for becoming an Agent: Pre-requisites for obtaining a License – Duration of License – Cancellation of License – Revocation or Suspension/Termination of Agent Appointment – Code of Conduct – Unfair Practices.

Unit – III Fundamentals of Agency (6 Hours)

Fundamentals of Agency - Definition of an agent – Agents Regulations – Insurance intermediaries – Agents’ Compensation – IRDA.

Unit – IV Functions of the Agent (6 Hours)

Functions of the Agent: Proposal Form and other forms for grant of cover – Financial and Medical Underwriting – Material Information – Nomination and Assignment – Procedure regarding settlement of Policy Claims.

Unit – V Marine & Fire Insurance (6 Hours)

Fundamentals and Principles of Marine and Fire Insurance - Contracts of various kinds of Insurance – Insurable Interest – Actuarial Science.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dr. P. Periyasamy	Insurance	Tata McGraw Hill	2 nd Edition 2018

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Mishra M.N	Insurance principles and practices	S.Chand& Co	22 nd Edition 2018
2.	Dr.P.K.Gupta	Insurance and Risk Management	Himalaya Publishing House, Mumbai	2017
3.	Kaninika Mishra	Fundamentals of Life Insurance, Theories and Application	Prentice Hall of India, New Delhi	2016

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Ms. B. Lavanya – Assistant Professor, Department of Commerce.

CORE COURSE – VII
MANAGEMENT ACCOUNTING

2021 – 2022 Onwards

Semester – IV	Management Accounting	Hours/Week – 5	
Core Course – VII		Credits – 5	
Course Code – 21UCO4CC7		Internal 25	External 75

Course Objective

- To understand the concepts and techniques of Management Accounting.
- To enhance a manager's ability to make effective Economic Decisions.
- To understand and analyze accounting information for Decision-Making, Planning and Control.

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	List out the concepts of Management Accounting	K1
CO2	Infer on the financial statements and develop knowledge to present a good Management Report	K2
CO3	Use cost-volume-profit analysis in Decision Making	K3
CO4	Analyse and interpret the performance of the firm through preparation of Financial Statements	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	M	S	S	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S

S-Strong , M- Medium , L- Low

Syllabus

Unit – I Introduction (15 Hours)

Management Accounting – Meaning, Scope, Objectives – Relationship between Financial, Cost and Management Accounting – Financial Statement Analysis – Comparative Statement – Common Size Statement – Trend Analysis.

Unit – II Marginal Costing & Ratio Analysis (15 Hours)

Marginal Costing – Concepts – CVP analysis – BEP –Margin of Safety — Ratio Analysis – Meaning – Classification – Liquidity, Solvency, Turnover and Profitability ratios.

Unit – III Fund Flow & Cash Flow Statement**(15 Hours)**

Fund Flow Statement – Meaning – Preparation – Schedule of changes in working capital – Fund from operations – Sources and applications – Cash flow Statement – Preparation of cash flow statement as per Accounting Standard 3.

Unit -IV Budgetary Control & Standard Costing**(15 Hours)**

Budget and Budgetary Control – Meaning – Advantages – Preparation of Sales, Production, Purchase, Cash and Flexible Budget. Standard Costing – Meaning, Advantages and Limitations – Variance Analysis – Material and Labour Variance only.

Unit - V Capital Budgeting**(15 Hours)**

Capital Budgeting – Meaning, Importance – Appraisal Method – Payback Period – Accounting Rate of Return – Discounted Cash Flow – Net Present Value – Profitability Index – Internal Rate of Return.

Distribution of Marks: Theory 20% and Problem 80%**Text Book**

S. No.	Authors	Title	Publishers	Year of Publication
1.	M.N. Arora	Cost and Management Accounting	Himalaya Publishing House	2015
2.	S. N. Maheshwari	Advanced Cost Accounting	Sultan Chand & Sons	2015
3.	Ramachandran & Srinivasan	Management Accounting	Sri Ram Publications	2015
4.	Khan and Jain	Management Accounting	Tata McGraw Hill	2015

Reference Book

S. No.	Authors	Title	Publishers	Year of Publication
1.	Ray Proctor	Managerial Accounting for Business Decisions	Pearson Publications	2016
2.	R.S.N. Pillai & Bhagavati	Management Accounting	S. Chand Publications	2015

Pedagogy

Lecture, Power Point Presentation, Group Discussion, Seminar, Quiz & Assignment

Course Designer

Dr. S. Sowmya, Assistant Professor, Department of Commerce.

CORE PRACTICAL – I
ACCOUNTING PACKAGE – PRACTICAL
2021 – 2022 Onwards

Semester – IV	Accounting Package – Practical	Hours/Week – 5	
Core Practical – I		Credits – 5	
Course Code – 21UCO4CC1P		Internal 40	External 60

Course Objective

- To enable the students to learn basic concepts of accounting packages.
- To impart knowledge about Goods and Services Tax.

Course Outcome

Or the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recall the basic concepts of manual accounting	K1
CO2	Explain the procedure for creating a company	K2
CO3	Apply the accounting procedures for Ledger creation, Accounting vouchers and Cost centre.	K3
CO4	Analyse stock group, stock category, stock item and compare stock category summary with godown summary	K4
CO5	Estimate budget	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	M	M
CO2	S	M	M	M	M
CO3	M	M	M	M	M
CO4	M	S	M	M	M
CO5	S	S	S	S	S

S-Strong , M- Medium , L- Low

Syllabus

Unit – I Introduction (15 Hours)

Introduction to Accounting Packages – Features – Introduction to Tally – Features of Tally – Creation – Alteration and Deletion of Company – Accounting Features – Accounting Groups – User defined groups – Ledger creation, alteration and deletion – Final Accounts and Balance Sheet.

Unit – II Accounting Voucher (15 Hours)

Accounting Vouchers – Various types of Accounting Vouchers – Voucher entries–
Extraction of Day book and Trial balance – Cost centres – Cost categories – Cost centre class – Bill
wise details – Interest calculation.

Unit – III Budget Creation (15 Hours)

Budget creation and alteration – Variance analysis – Payroll preparation – Statutory
features – voucher entries.

Unit - IV Inventories (15 Hours)

Inventory Masters: Creation, Alteration and Deletion of Stock Groups, Stock Categories,
Units of Measures, Godowns and Stock items – Inventory Features – Entries in Accounting and
Inventory vouchers using stock items.

Unit - V GST& Generating Reports (15 Hours)

Introduction to GST – Registration – Creating Company with GST – Creating Tax Ledgers-
Recording GST Sales – Financial Reports: Trial Balance – Profit and Loss – Balance Sheet –
Working Capital – Cash Flow and Fund Flow Statement – Bank Reconciliation Statement – Stock
Summary.

List of Practicals

1. Creation, alteration and deletion of companies and user defined accounting groups
2. Creation, alteration and deletion of ledger and final accounts and balance sheet preparation.
3. Voucher entries in double entry mode
4. Voucher entries using cost centres and cost categories
5. Voucher entries using bill wise details and interest calculation
6. Creation and alteration of budgets and variance analysis
7. Creation, alteration and deletion of inventory masters
8. Order processing and voucher entries using accounting and inventory vouchers.
9. Generating Accounting and Inventory Reports

Text Book

S.No	Authors	Title	Publishers	Year of publication
1	A.K. Nadhani	Implementing Tally ERP	BPB Publications, Chennai	2019
2	Tally Education Private Ltd., Bengaluru	Tally ERP 9	BPB Publications	2017

Reference

S. No	Authors	Title	Publishers	Year of publication
1	Vishnu P. Singh	Tally ERP 9 with GST	Sultan Chand & Sons	2018
2	V. Srinivasa vallabhan	Computer Applications in Business	Sultan Chand & Sons	2018

Pedagogy

Lecture, Power Point Presentation, Lab Demonstration, Group Discussion, Quiz, Assignment & Activity.

Course Designer

Ms. J. Lalithambigai, Assistant Professor, Department of Commerce.

ALLIED COURSE – IV

BUSINESS LAW

2019 – 2020 Onwards

Semester – IV	Business Law	Hours/Week – 4	
Allied Course – IV		Credits – 3	
Course Code – 19UCO4AC4		Internal 25	External 75

Course Objective

- To provide a conceptual study about the framework of Indian Business Laws.
- To orient students about the legal aspects of business.
- To familiarize students with case laws related to business.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the concept of contract and state the law relating to Indian Contract Act	K1
CO2	Explain the different elements of contract, performance of contract and different modes of discharge of contract	K2
CO3	Illustrate the application for registration of partnership	K3
CO4	List out the objectives of competition act	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	S	M	M
CO4	S	M	S	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I The Indian Contract Act, 1872: General Principles of Contract (12 Hours)

Contract – Meaning & Definition – Nature of Contract – Characteristics and Kinds – Essentials of a valid Contract – Offer and Acceptance - Consideration – Contractual Capacity – Free Consent – Legality of Objects – Void Agreements.

Unit – II The Indian Contract Act, 1872: Specific Contracts (12 Hours)

Performance of Contract – Modes of discharge of a Contract – Breach and its Remedies – Contingent Contracts – Quasi Contracts – Contract of Indemnity and Guarantee – Contract of

Bailment and Pledge – Contract of Agency.

Unit – III The Sale of Goods Act, 1930

(12 Hours)

Formation of Contract of Sale – Sale & Agreement to Sell – Conditions and Warranties – Doctrine of Caveat Emptor – Transfer of property – Passing of Property – Performance of Contract of Sale – Unpaid seller – Remedies for Breach of Contract of Sale – Auction Sale.

Unit – IV Partnership Act, 1932 & LLP Act 2008

(14 Hours)

Nature and Characteristics of Partnership - Registration of a Partnership Firms – Types of Partners – Rights and Duties of Partners – Implied Authority of a Partner – Incoming and Outgoing Partners - Mode of Dissolution of Partnership – The Limited Liability Partnership Act, 2008.

Unit – V Competition Act, 2002

(10 Hours)

Objectives – Salient features – Anti-competitive agreements – Prevention of abuse of dominant position – Combination – Competition advocacy – Competition Commission of India.

Text Book

S. No.	Authors	Title	Publishers	Year of Publication
1.	N.D. Kapoor	Elements of Mercantile Law	Sultan Chand & Sons Private Limited, New Delhi	2014
2.	R.S.N. Pillai & Bagavathi	Business Law	S. Chand & Co. Ltd., New Delhi	2016

Reference

S.No.	Authors	Title	Publishers	Year of Publication
1.	P.C. Tulsion & Bharat Tulsian	Mercantile Law	Tata Mc Graw Hill Education India	2014
2.	P.P.S. Gogna	Mercantile Law	S. Chand & Co. Ltd., New Delhi	2005

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Ms. D. Indumathi – Assistant Professor, Department of Commerce.

NON-MAJOR ELECTIVE – II
ADVERTISEMENT MANAGEMENT

2019 – 2020 Onwards

Semester – IV	Advertisement Management	Hours/Week – 2	
Non-Major Elective – II		Credits – 2	
Course Code - 19UCO4NME2		Internal 25	External 75

Course Objective

- To know the basic marketing communication and the processes.
- To understand the process involved in personal selling and its implications for relationship development.
- To comprehend the ethical issues and social aspects of advertising.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall the conceptual framework of advertising	K1
CO2	Explain the formulation of advertising through effective marketing strategy to promote the product and service for economic development	K2
CO3	Identify the recent era in advertising and its powerful tools	K3
CO4	Analyze the ethical issues and social aspects of advertising	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	S	S	S	S
CO3	M	S	S	S	S
CO4	M	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Advertising (6 Hours)

Advertising – Definition - Objectives, Scope and Types - Role & Significance – Advertising an element of marketing mix – Communication process in advertising.

Unit – II Technological Aspects (6 Hours)

Advertisement Message, Themes, Appeal, Structure, Copywriting and Layout – DAGMAR approach, Determination of target audience – Building of advertising programme – Message, Headlines, Copy, Logo, Illustration, Appeal and Layout.

Unit – III Advertising Media (6 Hours)

Media planning, Electronic media, Buying advertising aids, Trademarks, Slogans, Packaging, Pop - up displays, Premiums, Free samples etc.,

Unit – IV Advertising Agencies (6 Hours)

Advertising Agencies: Selection, Compensation and Appraisal of an agency – Methods of measuring advertising effectiveness - Developing corporate image – Techniques, Concepts and Practices.

Unit – V Advertising in India (6 Hours)

Role of Advertising in modern business - Economic, Social and Ethical aspects of advertising and advertising goals – Recent developments and Issues in advertising.

Text Book

S. No.	Authors	Title	Publishers	Year of Publication
1.	S.L. Gupta & V.V. Ratna	Advertising and Sales Promotion Management, An Indian perspective Text and Cases	Sultan Chand & Sons, New Delhi	2004

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Ruchi G.	Advertising Principles & Practice	S.Chand& Company Ltd, Delhi	2012
2.	Dr.Ansuya. Angadi	Advertising & Sales Management	Sri Siddalingeshwara Prakashana, Gulbarga	2010
3.	Aaker, David A., Rajeev Batra and John G. Mayers	Advertising Management	Prentice Hall of India Pvt. Ltd., New Delhi	2001

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Ms. Shilpa A. Talreja – Assistant Professor, Department of Commerce.

SKILL BASED ELECTIVE – I

A. INTRODUCTION TO MS-WORD (PRACTICAL)

2021 – 2022 Onwards

Semester – IV	Introduction to MS-Word (Practical)	Hours/Week – 2	
Skill Based Elective – I		Credits – 2	
Course Code – 21UCO4SBE1AP		Internal 40	External 60

Course Objective

- To understand basic and advanced text, paragraph and document formatting.
- To create brochures, flyers and business cards using MS-Word.
- To apply tables and templates by using formatting tools.

Course Outcome

O: the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	List out the components of MS-Word	K1
CO2	Demonstrate the use of hyperlink option	K2
CO3	Apply Mail merge concepts and mathematical expressions	K3
CO4	Analyse word processing terminology and concepts	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	M	M	M
CO3	M	M	M	M	M
CO4	M	M	M	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Beginning to use Microsoft Word (6 Hours)

Microsoft Word – Opening a New Document – Saving a Document – Basic Editing – The Cursor – Inserting Text – Deleting Text, Text Undo and Redo – Wrap Text – Formatting – Selecting Text – Applying a Font – Changing Font Size – Font Attributes – Font Colour Clear Formatting – Text Alignment Copying and Moving Texts and Objects – The Clipboard – Paste.

Unit – II Editing Features (6 Hours)

Spell Check — Thesaurus – Auto Correct – Creating own Default Dictionary – Word Count – Track Changes – Accepting and Rejecting Changes – Page View – Zoom – Paragraph Formatting – Alignment – Indenting – Add Borders or Shading, Apply Paragraph Styles – Change Spacing

between Paragraphs and Lines – Hyperlink.

Unit – III Tables (6 Hours)

Creating Tables – Creating a table by highlighting the boxes – Create a table by using Insert Table command – Converting Text into a Table – Quick Tables – Entering Text – Table Tools - Inserting rows and columns – Deleting Cells, Rows or Columns – Merging Cells and Splitting Cells – Adjusting Column Width – Position text within a Cell – Borders and Shading. Bulleted and Numbered Lists – Creating Outlines

Unit – IV Page Formatting (6 Hours)

Apply a Page Border and Colour – Changing the Orientation, Size of the Page, or Size of Columns – Insert Headers and Footers (including Page Numbers – Creating a Page Break inserting Graphics, Pictures, and Table of Contents – Inserting Special Characters).

Unit – V Advanced Tools (6 Hours)

References and Citations – Macros – Compare and Merge Documents – Protect Document – Mailing Lists – Creating a List for Mail Merge – Mail Merge.

List of Practicals:

1. Type a meaningful message in word document. Give a title for the passage and format the same as per the specification given below:
 - Insert date and time, Title should be in Bold, italics, underlined
 - Font size, style, Line spacing should be doubled
 - Set left margin to 1.5, right margin to 1.75
 - Apply border to the passage
2. Prepare a timetable using Table Auto format in Ms Word.
3. Prepare a bio-data in Ms Word using wizard.
4. Using text box options prepare an invitation for your college day or for your department function.
5. Using mail merge prepare an interview call letter.
6. Design value added web pages in Ms-Word that convey information about your curriculum-
Hyperlink.

Reference

S. No.	Authors	Title	Publishers	Year of Publication
1.	Bittu Kumar	Microsoft Word 2010	V & S Publishers	2017
2.	Faithe Wempen	Microsoft Word 2010 in Depth	QUE	2010

Pedagogy

Lab Demonstration, Activity and Power Point Presentation.

Course Designer

Ms. Shilpa A. Talreja, Assistant Professor, Department of Commerce.

SKILL BASED ELECTIVE – I

B. CREATIVE ADVERTISING (PRACTICAL)

2021 – 2022 Onwards

Semester – IV	Creative Advertising (Practical)	Hours/Week – 2	
Skill Based Elective – I		Credits – 2	
Course Code – 21UCO4SBE1BP		Internal 40	External 60

Course Objective

- To understand the communication process that takes place while advertising and to analyse it from the view point of a customer.
- To highlight the importance of advertising as a business strategy.

Course Outcome

O: the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall basic concepts of advertisement	K1
CO2	Explain how creativity can be incorporated in an advertisement	K2
CO3	Develop advertising media buying and planning strategies	K3
CO4	Analyse effective visual communication for various advertising approaches that combine the use of print, online/digital, and other multimedia communication	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	M	M	M
CO3	M	S	M	M	M
CO4	M	M	M	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction (6 Hours)

Creative Advertising Meaning – definition of marketing and advertising – functions of advertising – communication and persuasion process – human communication process – advertising exposure model – applying communication process to advertising.

Unit – II Consumer Perception (6 Hours)

Consumer Behaviour – consumer decision making process – consumer perception process.

Unit – III Creative Advertising**(6 Hours)**

Creativity in advertising, creative thinking – Creative process – Appeals – Copy Writer – Copy Writing – Print Copy elements, Headlines – body Copy – Slogan elements of design and principles of design.

Unit – IV Designing**(6 Hours)**

Designing Print Ad – choosing format – designing page – choosing typefaces – working with visuals – lay-out ready for print.

Unit – V Advertising Strategy**(6 Hours)**

Advertising and Media strategy – Role of Media; types of media, their advantages and Disadvantages, media planning, selection & scheduling strategies.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Chunawalla & K. C. Sethia	Foundation of Advertising Theory & Practice	Himalaya Publishing House, New Delhi	2000
2.	William H. Bolew	Advertising	John Wiley & Sons New York	1995
3.	Courtland Bovee John Thill & George Dovel	Advertising Excellence	Tata Mc Graw Hill Publications, New Delhi,	1995

Pedagogy

Lab demonstration, Power Point Presentation and Activity

Course Designer

Ms. S. Praveena, Assistant Professor, Department of Commerce.

**CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)**

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

**PG & RESEARCH DEPARTMENT OF
COMMERCE**



LEARNING OUTCOMES BASED CURRICULUM

FRAMEWORK

(CBCS - LOCF)

B.Com. CA

2022 -2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF COMMERCE

VISION

Commitment to pursue excellence in commerce education, while equipping students with knowledge and skills in commerce stream, inculcate values, identify hidden talents, provide opportunities for students to realize their full potential and thus shape them into national assets, and to pursue a real holistic development, integrity moral and ethical uprightness.

MISSION

- To promote excellent education in the changing environment of information and communication technology and commerce sectors.
- Creating an urge in students to take up entrepreneurship in online to be successful by standing on their feet instead of being dependent on others.
- Grooming youth to become a truly global personality well equipped to deal with the modern world and its challenges.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Com., B.Com. CA,

B.B.A. PROGRAMME

PO NO.	On completion of B.Com. /B.Com. CA / B.B.A. Programme, The students will be able to
PO 1	PROGRAMME KNOWLEDGE AND ENVIORNMENT SUSTAINABILITY Acquire a strong foundation in the areas of Commerce, Management and Information Technology that needs to respond to the constantly changing Business and Legal environment.
PO 2	CRITICAL THINKING AND DECISION MAKING SKILLS Analyse and develop solutions through various computational techniques for real time problems in all areas of Business Management specially Finance, Marketing, Human Resources and Operations.
PO 3	ENTREPRENEURSHIP SKILLS AND COMPETENCY DEVELOPMENT Apply the competencies and creativity required to undertake entrepreneurship as a desirable and feasible career option or be employed in various positions in industry, academia and Government.
PO 4	TEAM WORK AND PROFICIENCY DEVELOPMENT Imbibe professionalism to embrace new opportunities of emerging technologies, leadership and team work in a dynamic ethical business scenario.
PO 5	PROFESSIONAL SKILLS AND EMPLOYABILITY Internalize the learned concept of Business and Commerce that will enable them to become skilled professionals and to enhance the career prospects.

PROGRAMME SPECIFIC OUTCOMES FOR B.Com. CA

PSO NO	The Students of B.Com. CA will be able to	POs Addressed
PSO1	Understand the various concepts related to Commerce and Computer Applications.	PO1 PO2
PSO2	Inculcate critical thinking and problem-solving skills to excel in technologies and its services used ethically in various sector.	PO2
PSO3	Adopt frameworks for sustainable development in their career with virtuous to become a successful entrepreneur and application developer.	PO3
PSO4	Become acquainted with commercial knowledge and professional skills to react the most appropriate way when faced with challenges.	PO4 PO5
PSO5	Exhibit proficiency in globally relevant multidisciplinary areas of computing with environmental considerations.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE

B.Com. CA – PROGRAMME STRUCTURE

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(For the candidates admitted from the academic year 2022 – 2023 onwards)

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total									
								Internal	External										
I	I	Language Course - I (LC)	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100									
			Hindi Literature & Grammar - I	22ULH1															
			History of Popular Tales Literature and Sanskrit Story	22ULS1															
			Basic French -I	22ULF1															
	II	English Language Course - I (ELC)	Functional English for Effective Communication - I	22UE1	6	3	3	25	75	100									
	III	Core Course - I (CC)	Principles of Accountancy	22UCC1CC1	6	6	3	25	75	100									
											Core Course - II (CC)	Modern Management Concepts	22UCC1CC2	6	6	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal - Universal Human Values	22UGVE	2	2	-	100	-	100									
			Total			30	23				600								

II	I	Language Course - II (LC)	Idaikkala Ilakkiyamum, Pudhinamum	22ULT2	5	3	3	25	75	100									
			Hindi Literature & Grammar - II	22ULH2															
			Poetry, Textual Grammar and Alankara	22ULS2															
			Basic French -II	22ULF2															
	II	English Language Course - II (ELC)	Functional English for Effective Communication - II	22UE2	6	3	3	25	75	100									
	III	Core Course - III (CC)	Modern Marketing	22UCC2CC3	6	6	3	25	75	100									
											Core Course -IV (CC)	Web Design	22UCC2CC4	6	6	3	25	75	100
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	3	100	-	100									
			Extra Credit Course	SWAYAM Online Course	As per UGC Recommendations														
		Total			30	23				600									

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCC1CC1	PRINCIPLES OF ACCOUNTANCY	CORE	6	6

Course Objective

- Understand the significance of preparing the different books of accounts of a firm and the preparation of final accounts, Non – Trading Organization, Bank Reconciliation Statement.
- Realize the meaning and importance of Fire Insurance, Royalty and its accounting treatment.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and summarize the general principles of accounting in maintenance of financial records.	K1, K2
CO2	Explain the various procedures in recording different types of financial transactions.	K2
CO3	Apply the components of final accounts using double entry system of booking keeping.	K3
CO4	Categorize the suitable methods of accounting system to determine the profit, loss and claims.	K4
CO5	Analyse and explain the accounting concepts and standards in the preparation of financial statement.	K4, K5

Mapping of CO with PO and PSO

COs / POSs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Accounting Standards – Double entry system – Journal, Ledger and Trial Balance – Subsidiary books – Bank Reconciliation Statement: Favorable and Unfavorable Balance.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

II	Rectification of Errors: Errors disclosed by Trial balance – Errors not disclosed by Trial Balance – Suspense Account. Final Accounts of sole traders: Trading Account – Profit & Loss Account – Balance Sheet – Adjustment.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Accounts of Non-Trading Concerns: Receipts & Payment Account – Income & Expenditure Account – Balance Sheet. Average Due Date – Account Current.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Single Entry System: Difference between Single Entry and Double Entry System of accounting – Ascertainment of profit - Net worth Method – Conversion Method. Depreciation: Meaning – Importance – Methods of providing Depreciation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Fire Insurance: Meaning – Importance - Loss of Stock – excluding Loss of Profit – various methods of calculating Loss of Stock. Royalty Accounts: Analytical table – Accounting Treatment in the books of Lessor and Lessee - excluding sublease.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examination) Bases of Accounting – Difference between Trial Balance and Balance Sheet – Classification of Capital and Revenue items – Difference between Bills Receivable and Bills Payable – Various types of royalty.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Distribution of Marks: Theory 20% & Problem 80%

Text Book

1. T.S. Reddy & Murthy A. (2020). *Financial Accounting*. 8th Revised Edition, Margham Publication.
2. Jain S.P and Narang K.L. (2016). *Financial Accounting*. Kalyani Publishers.

Reference Books

1. Dalston L. Cecil and Jenitra L. Merwin. (2015). *Business Accounting*. 4th Edition, Learn Tech Publishers.
2. R.L. Gupta & Radhaswamy M. (2018). *Financial Accounting*. 8th Edition, Sultan Chand Sons.

3. Shukla & Grewal. (2018). *Advanced Accountancy*. Sultan Chand Sons.

Web References

1. www.accountingcoach.com
2. www.accountingstudyguide.com
3. www.futureaccountant.com
4. www.onlinelibrary.wiley.com

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. D. Ramya, Assistant Professor, Department of Commerce

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCC1CC2	MODERN MANAGEMENT CONCEPTS	CORE	6	6

Course Objective

- To familiarize the students on the modern management concepts in order to aid in understanding how an organization functions and the challenging issues a management confronts in today's business firm.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the concepts and functions of modern management	K1
CO2	Demonstrate the roles, skills and functions of management	K2
CO3	Explain various types of planning and decision-making process	K2
CO4	Identify issues and challenges of management	K3
CO5	Analyze different processes in organizing and controlling	K4

Mapping of CO with PO and PSO

COs / POSs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2	3	2	3	3	3
CO2	2	3	3	3	3	2	3	3	3	3
CO3	1	2	3	3	3	2	2	2	2	2
CO4	1	3	3	3	3	2	3	3	2	2
CO5	2	2	2	2	2	1	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Management – Definition - Meaning – Nature and Scope - Functions, Skills of a Manager, Process of Management, Pioneer	18	CO1, CO2,	K1, K2, K3, K4

	thoughts of management; contribution of Henry Fayol and F.W. Taylor – George Elton Mayo – Douglas McGregor – Renisis Likert – Mary Parker Follett – Chester I Barnard – Chris Argyris – Herbert A Simon – Peter F. Drucker		CO3, CO4, CO5	
II	Planning – Nature – Process – Types – Importance – Decision making: types of Decision – Process of decision making – Models & Issues	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Organization – Structure and Types – Departmentation – Centralization-Decentralization, Delegation – Span of management – Line & Staff Organization – Matrix Organization – Motivation – Meaning – Definition – Nature – Types of motivation – Theories of motivation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Co-ordination and Controlling – Principle – Process-Control – Tools and Techniques – MBO (Management by Objectives) – MBE (Management by Exception) – MBP (Management by Participation) – MBS (Management by Systems).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Contemporary Issues – Objectives – Changing Environment – Recent trends and Challenges and challenges for the future manager – Changing Indian Business Environment – Role of managers in twenty first century – Emerging issues and challenges of management – Trends in management and its challenges – Emerging principles of management.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Environmental factors that a manager should consider in an organization – Forecasting and its techniques – Organization chart and manual – Information Technology in management control – Contemporary managerial approaches.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. C.B. Gupta, 2018, Business Management, Sultan Chand & Sons.
2. Koontz, O'Donnell & Weihrich, 2020 Essentials of Management, Tata McGraw-Hill.

Reference Books

1. R.N. Gupta, 2018, Principles of Management, S Chand & Co.
2. Robbins & Coulter, 2019, Management, Pearson education, 12th edition.

Web References

1. <https://cbseacademic.nic.in>.
2. <https://ncert.nic.in/textbook>.
3. <http://www.freebookcentre.net>.
4. <https://www.egyankosh.ac.in>.
5. <https://www.yourarticlelibrary.com>.
6. <http://courses.washington.edu>.
7. <https://www.googleadservices.com>.
8. <https://www.toppers.com>.

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. B. Lavanya

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UCC1AC1	FUNDAMENTALS OF COMPUTER AND INTERNET	ALLIED	4	3

Course Objective

- At the end of the course the students shall be able to get the basic knowledge about computer, memory, input and output devices, OS, DB, networks, security and internet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the fundamental concepts of computer and its parts, OS, DB, networks, security and internet.	K1
CO2	Summarize the concepts of memory representation, OS, DB, networks, security and internet.	K2
CO3	Interpret the concepts of input, output devices, algorithm, types of OS, hacking and firewalls in security and internet connections.	K3
CO4	Apply the Number system conversions and the real time usage of internet, sketch the flowchart, Use the Computer-Based Information System (CBIS)	K3
CO5	Distinguish the different types of memories, number systems, OS, networks and internet.	K4

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	2	2	1	-
CO2	3	2	2	3	2	3	2	1	1	-
CO3	2	2	1	1	2	2	2	1	2	1
CO4	3	3	3	2	3	3	2	1	2	-
CO5	2	2	1	1	1	2	1	1	1	1

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Computer: Characteristics of Computer - Classification of Computer – The Computer System – Application of Computers. The Computer System Hardware: Central Processing Unit. Computer Memory: Memory Representation – Memory Hierarchy – CPU Registers – Cache Memory – Primary	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Memory – Secondary Memory. Input and Output devices: Input-Output Unit – Input devices – Output devices.			
II	Data Representation: Number System – Conversions – Binary Arithmetic. Computer Programming Fundamentals: Program Development Life Cycle – Algorithm – Control Structures – Flowchart.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Interaction of User and Computer: Types of Software - System Software - Application Software. Operating System (OS): Introduction – Objectives of OS – Type of OS – Function of OS - Examples of OS. Information Systems (IS): Data, Information and Knowledge - Characteristics of Information - Information System (IS) - Computer-based Information System (CBIS) - Need for Efficient Information System - Categories of Information System - Operations support System - Management Support System - Specialized Information System - Careers in information System.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Data Communication and Computer Network: Importance of Networking - Computer Network – Network types – LAN Topologies – Communication Protocol – Network Devices – Wireless Networking. Computer Security: Security Thread and Security Attack – Malicious Software – Hacking – Security Services – Firewall – User Identification and Authentication.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Introduction –Internetworking Protocol – The Internet Architecture – Managing the Internet – Connecting to Internet – Internet Connections – Internet Addresses - World Wide Web – Electronic Mail – Uses of Internet.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) E-mail Address Creation – Send and Receive Mails – Chatting – Search Engines – Search and Download E-Books – Online Course Registration – Online Purchasing and Cancellation – Creating a Meet ID through zoom and Google meet.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Anita Goel. (2022). *Computer Fundamentals*. Pearson India Education Services Pvt. Ltd. Thirty Fourth Impression.

Reference Books

1. Dr. Shalii Jain & Geeta M. (2016). *Course on Computer Concepts*. 2nd Edition, BPB Publications.
2. Paul E. Hoffman. (2016). *The Internet Instance Reference*. BPB Publications.

Web References

1. https://www.tutorialspoint.com/computer_fundamentals/index.htm
2. <https://www.javatpoint.com/computer-fundamentals-tutorial>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Yasodha.

Semester I	Internal Marks: 100	External Marks: -		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UGVE	UNIVERSAL HUMAN VALUES	Part - IV	2	2

Course Objectives

- To enable the learners to learn the values of love and compassion.
- To foster the values of righteousness and service among the learners.
- To enhance the morale of the learners by inculcating the values renunciation and peace.
- To inspire the learners to practice the basic human values so as to make them become responsible citizens of the Nation.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth and Non - Violence	K2
CO3	Explain the value of Righteousness and Service	K3
CO4	Practice the values of Renunciation (sacrifice) & Peace	K4
CO5	Prioritize Human Values in their day today life	K5

Syllabus

UNIT – I

(6 Hours)

Love and Compassion

- **Introduction:** what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore.

UNIT – II

(6 Hours)

Truth and Non - Violence

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- **Introduction:** what is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore

UNIT – III

(6 Hours)

Righteousness and Service

- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore.

UNIT – IV

(6 Hours)

Renunciation (sacrifice) & Peace

- Introduction: what is renunciation? Renunciation and sacrifice. Self-restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace

UNIT – V

(6 Hours)

Practicing human values

- What will learners learn/gain if they practice human values? What will learners lose if they Don't Practice human values?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies

Pedagogy

Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, and Case Study.

Course Designer

Dr. G. Mettilda Buvaneswari.

Semester II	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UCC2CC3	MODERN MARKETING	CORE	6	6

Course Objective

- To familiarize the students with basic knowledge of various concepts, dimensions and trends in modern marketing practices.
- To understand the moralities of sales distribution and control.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the various terms used in marketing and list out channels of distribution in marketing	K1
CO2	Outline the role and importance of marketing and explain the factors and theories of buyer behaviour	K2
CO3	Apply different pricing strategies of a firm and identify various promotional programmes	K3
CO4	Analyse the recent developments in marketing and strategies opted for market segmentation.	K4
CO5	Examine the factors influencing buyer behaviour and Categories the customers and their wants and needs	K4

Mapping of CO with PO and PSO

COs/PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2	3	2	2	2	2
CO2	3	3	2	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low) Correlation □ “2”– Moderate (Medium)Correlation □

“3”–Substantial (High) Correlation □ “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	CO's	COGNITIVE LEVEL
I	Marketing – Definition, Concepts– Significance & Functions of Marketing – Approaches to the study of Marketing – Relevance of Marketing in a	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	developing economy – Role & functions of Marketing Manager.			
II	Consumer Behaviour: Nature and Importance – Factors influencing Consumer buying behaviour. Market Segmentation: Concept – Importance and bases – Product differentiation vs. Market Segmentation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Product: Meaning – Product Planning – Policies – Positioning – New Product Development – Product Life Cycle – Branding, Packing, Labeling. Pricing: Pricing Objectives – Factors, Methods and Procedure.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Promotion: Promotion Mix – Advertisement – Message – Copywriting - Budgeting – Measuring Advertisement Effectiveness – Media Strategy – Sales Promotion – Personal Selling and Publicity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Marketing Strategies – Tools for competitive differentiation of product – Strategies for competitors – Leaders, challenges, follower and niches – Marketing of services – Consumerism.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Various environment affecting the marketing functions – Market targeting – Distribution logistics: importance and decisions factors to be considered in channel selection		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. R. S. N. Pillai & V. Bagavathi (2010). Modern Marketing. S. Chand & Co.
2. N Rajan Nair, Sanjith R Nair.(2015). Marketing, Sultan Chand & Sons.

Reference Books

1. Dhruv Grewal. (2018).Marketing. Tata McGraw Hill India.
2. Philip Kotler.(2015).Marketing Management. Sultan Chand & Sons.
3. S. A. Sherlekar , R. Krishnamoorthy, (2010). Marketing Management. Himalaya Publishing House.

Web References

1. <http://gundasrinivas.com/wp-content/uploads/2020/11/Fundamentals-of-Marketing.pdf>
2. http://eprints.stiperdharmawacana.ac.id/24/1/%5BPhillip_Kotler%5D_Marketing_Management_14th_Edition%28BookFi%29.pdf
3. <https://library.wbi.ac.id/repository/212.pdf>
4. [http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final\(crc\).pdf](http://www.mdudde.net/books/mcom/mcom-f/marketing-management-final(crc).pdf)

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. Shilpa A. Talreja.

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCC2CC4	WEB DESIGN	CORE	6	6

Course Objectives

- To introduce the realm of web design
- To impart theoretical knowledge in designing web page using HTML5 and CSS

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Define the basic concepts of web design	K1
CO2	Illustrate the components of web design	K2
CO3	Identify the different type of tags to create web pages	K3
CO4	Apply the theoretical knowledge to develop websites	K4
CO5	Construct basic websites using HTML5 and Cascading Style Sheets	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	2	3	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	3
CO4	3	2	3	2	2	2	2	2	3	3
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Getting Started with HTML5: Introduction to HTML5 – Defining HTML Markup – Basic Structure of an HTML – Modifying the Background of an HTML Web Page – Specifying Metadata about an HTML	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5

	Web Page - Introduction to New Elements in HTML5: The Markup Elements – The Media Elements – The Canva Element – The Form Element – The Input Type Attribute Values – The New Attributes – The New Event Attributes – The Window Event Attributes – The Form Events – The Mouse Events – The Media Events			
II	Working with Text: Adding Plain Text to an HTML Web Page – Adding Text in New Line – Creating Headings on a Web Page – Creating Paragraph – Creating Horizontal Rule – Creating Subscript and Superscript – Aligning the Text – Grouping the Text – Indenting Quotations – Working with Character Entities. Lists: Working with Lists – Nested Lists	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5
III	Tables: Creating a Table – Table caption – Adding a Table Heading – Table Border – Aligning Table and Cell Content – Table width and Column Width - Changing Background – Cell Padding – Cell Spacing – Spanning Rows and Columns – Nesting Tables Frames: Creating a Frame – Defining a new Element with Specific Attributes – Height and Width of Frame – Hyperlinks to Frames	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5
IV	Hyperlinks, Images ang Multimedia: Working with Hyperlinks – Working with Images – Creating Image Maps – Working with Multimedia. Forms and Controls: Creating an HTML Form – Specifying the Action URL and The Method to Send the Form – Adding Controls to an HTML Form – Understanding New Form Elements – Grouping the Controls of HTML Forms – Specifying a Label for a Control	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5
V	Working with Cascading Style Sheets: Understanding Style Sheets – Working with Styles – Working with Background Properties – Working with Text Properties – Working with List Properties – Working with HTML Element Box Properties – Working with Positioning and Block Properties	18	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not to be included for External Examination) Introduction to Internet –World Wide	-	CO1,CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5

Web (WWW) – Web Page – Hyper Text – Net Surfing – Internet/Web Browsing – Browser – Internet Addressing – IP Address – Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols – TCP/IP – FTP – HTTP.			
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Textbook

1. DT Editorial Services. (2015). HTML 5 in Simple Steps, 2nd Edition, Dreamtech Press New Delhi.

References

1. Mike McGrath. (2017). HTML 5 in Easy Steps, 2nd Edition, In Easy Steps Limited.
2. Ben Frain. (2020) Responsive Web Design with HTML5 and CSS, 3rd Edition, Packt Publishing Ltd. UK.

Web References

1. <https://www.tutorialspoint.com/html5/index.htm>
2. <https://www.javatpoint.com/html5-tutorial>
3. <https://www.w3schools.com/html/>

Pedagogy

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

Semester II	Internal Mark: 40		External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCC2AC1P	HTML (P)	ALLIED	5	3

Course Objective

- To impart practical knowledge in designing web page using HTML5 and CSS

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Define the basic concepts of web design	K1
CO2	Illustrate the components of web design	K2
CO3	Identify the different type of tags to create web pages	K3
CO4	Apply the practical knowledge to develop websites	K4
CO5	Construct basic websites using HTML5 and Cascading Style Sheets	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	3	3	2
CO2	3	2	3	1	1	3	3	3	3	2
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	2	3	2	2	2	2	3	3	3
CO5	3	3	3	2	2	3	3	3	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

List of Practical

1. Creating a Webpage Layout using Semantic elements
2. Example for Audio element
3. Example for Video element
4. Creating a Registration form with validation
5. Drawing 2D graphics using Canvas
6. Example for Local Storage
7. Example for Drag and Drop
8. Rose bud using Canvas
9. Animation using Canvas

10. Creating a Webpage using CSS

Web References

1. <https://tutorial.techaltum.com/html5.html>
2. http://www.makeitsimple.co.in/HTML5_programs.php
3. <https://www.tutorialspoint.com/html5/index.htm>
4. <https://www.javatpoint.com/html5-tutorial>

Pedagogy

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications

Semester: II	Internal Marks: 100			
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22UGEVS	ENVIRONMENTAL STUDIES	Part - IV	2	2

Course Objective

- To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K1, K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classify various types of ecosystem with its structure and function.	K2, K3
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment and explain protection acts	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3”–Substantial (High) Correlation “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVEL EVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1,CO2, CO3,CO4	K1, K2, K3,
II	<p>Natural Resources: Renewable and non-renewable resources:</p> <p>a. Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.</p> <p>b. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.</p> <p>c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.</p> <p>d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.</p> <p>e. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.</p> <p>f. Land resources: Land as resources, land degradation, man induced Land slides, soil erosion and desertification.</p> <p>g. Role of an individual in conservation of natural resources.</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3

<p>III</p>	<p>Ecosystems Concept, Structure and function of an eco system. Producers, consumers and decomposers Energy flow in the eco system and Ecological succession. Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystems:- Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)</p>	<p>06</p>	<p>CO1, CO2, CO3, CO4</p>	<p>K1, K2, K3</p>
<p>IV</p>	<p>Bio diversity and Environmental Pollution Introduction, types and value of biodiversity. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Definition, Causes, effects and control measures of: a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise pollution e. Nuclear hazards Solid waste Management: Causes, effects and control measures of urban and industrial wastes. E Waste Management: Sources and Types of E-waste. Effect of E waste on environment and human body. Disposal of E-waste, Advantages of Recycling E -waste. Role of an individual in prevention of pollution. Disaster management: floods, earthquake, cyclone and landslides.</p>	<p>06</p>	<p>CO1, CO2, CO3, CO4, CO5</p>	<p>K1, K2, K3, K4, K5</p>

V	<p>Social Issues and the Environment</p> <p>Water conservation, rain water harvesting, water shed management. Climate change, global warming, acid rain, ozone layer depletion, Wastel and reclamation.</p> <p>Environment Protection Act</p> <p>Wild life Protection Act. Forest Conservation Act. Population explosion–Family Welfare Programmes Human Rights-Value Education.HIV/ AIDS- Women and Child Welfare. Role of Information Technology in Environment and human health.</p>	06	CO1, CO2, CO3,CO4, CO5	K1, K2, K3,K4, K5
VI	<p>Self-Study for Enrichment</p> <p>(Not to be included for End Semester Examination)</p> <p>Global warming – climate change – importance of ozone – Effects of ozone depletion. Biogeography – history, ecology and conservation. International laws and policy</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References

1. Beard, J.M. 2013. Environmental Chemistry in Society (2nd edition). CRC Press.
2. Girard, J. 2013. Principles of Environmental Chemistry (3rd edition). Jones & Bartlett.
3. Brebbia, C.A. 2013. Water Resources Management VII. WIT Press.
4. Pandit, M.K. & Kumar, V. 2013. Land use and conservation challenges in Himalaya: Past, present and future. In: Sodhi, N.S., Gibson, L. & Raven, P.H. Conservation Biology: Voices from the Tropics. pp. 123-133. Wiley-Blackwell, Oxford, UK
(file:///Users/mkpanidit/Downloads/Raven%20et%20al.%202013.%20CB%20Voices%20from%20Tropics%20(2).pdf)
5. Hites, R.A. 2012. Elements of Environmental Chemistry (2nd edition). Wiley & Sons.
6. Harnung, S.E. & Johnson, M.S. 2012. Chemistry and the Environment. Cambridge

University Press.

7. Boeker, E. & Grondelle, R. 2011. Environmental Physics: Sustainable Energy and Climate Change.
8. Wiley. Forinash, K. 2010. Foundation of Environmental Physics. Island Press.
9. Evans, G.G. & Furlong, J. 2010. Environmental Biotechnology: Theory and Application (2nd edition). Wiley-Blackwell Publications.
10. Williams, D. M., Ebach, M.C. 2008. Foundations of Systematic and Biogeography. Springer
11. Pani, B. 2007. Textbook of Environmental Chemistry. IK international Publishing House.
12. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. B. Thamilmalai Selvi

Ability Enhancement Compulsory Course II (AECC) : Environmental Studies

(22UGEV5) Assessment Rubrics for 100 Marks

1. Documentary (or) Poster Presentation (or) Elocution-25 Marks
2. Quiz (or) MCQ Test-25 Marks
3. Album Making (or) Case study on a topic (or) Field Visit -25 Marks
4. Essay Writing (or) Assignment (Minimum 10 pages) -25 Marks

There will be no End Semester Examination for this course. However, the subject teacher will evaluate the above-mentioned components based on the performance of the students and submit the marks out of 100 (in the format to be supplied by the COE) with the approval of the concerned Head of the Department to the COE along with CIA marks of other courses.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NAAC Accreditation III Cycle: A Grade

(CGPA 3.41 out of 4)

**ISO 9001: 2015 Certified by IRCLASS & Accredited by
NABCB**

PG & RESEARCH DEPARTMENT OF COMMERCE



2021 - 2024

B.Com. CA

Syllabus

B.Com. COMPUTER APPLICATIONS

The Course Programme will acquaint the students with Strong theoretical background of commerce stream along with current digital applications to manage business transactions. Specializing computer application in field of commerce is an extra mileage in placements.

PROGRAMME OUTCOMES

- PO1:** Develop appropriate knowledge in the application of accounting principles integrated with information systems and to provide the required financial information for effective decision-making.
- PO2:** Analyze and apply the latest technologies to solve problems in the areas of computer applications.
- PO3:** Exhibit an understanding on the concepts and emerging trends in the management domain that includes various sectors such as Banking, Insurance along with the legal boundaries.
- PO4:** Develop a wide spectrum of managerial skills through a theoretical foundation in specific areas of management studies.
- PO5:** Recognize and imbibe the critical thinking skills in relation to entrepreneurial development and life ethics along with the environment prospects.

PROGRAMME SPECIFIC OUTCOMES

- PSO1:** Analyze the scope of the business by adopting modern technology in the business practices.
- PSO2:** Understand the application of business knowledge in both theoretical and practical aspects.
- PSO3:** Graduates will gain a strong foundation of knowledge in different areas of Commerce and Computer Application courses.



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF COMMERCE

B.Com. Computer Applications – PROGRAMME STRUCTURE
(For the candidates admitted from the academic year 2021 – 2022 onwards)

I Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
I	I	Language Course - I (LC)	Ikkala Elakkiyam	19ULT1	6	3	3	25	75	100	
			Communication in French - I	19ULF1							
			History of Popular Tales Literature and Sanskrit Story	19ULS1							
			Story, Novel, Hindi Literature - I & Grammar - I	19ULH1							
	II	English Language Course - I (ELC)	Functional Grammar for Effective Communication - I	19UE1	6	3	3	25	75	100	
	III	Core Course - I (CC)	Principles of Accountancy	19UCC1CC1	6	5	3	25	75	100	
			Core Course -II (CC)	Modern Management Concepts	19UCC1CC2	6	5	3	25	75	100
			Allied Course - I (AC)	Fundamentals of Computer & Internet	20UCC1AC1	4	3	3	25	75	100
	IV	UGC - Jeevan Kaushal Life Skills	Universal Human Values	20UGVE	2	2	3	25	75	100	
			Total			30	21				600



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DEPARTMENT OF COMMERCE

B.Com. Computer Applications – PROGRAMME STRUCTURE
(For the candidates admitted from the academic year 2021 – 2022 onwards)

II Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
II	I	Language Course - II (LC)	Idaikkala Elakkiyamum Pudhinamum	19ULT2	6	3	3	25	75	100	
			Communication in French - II	19ULF2							
			Poetry Textual Grammar and Alankara	19ULS2							
			Prose, Drama, Hindi Literature - 2 & Grammar - II	19ULH2							
	II	English Language Course- II (ELC)	Functional Grammar For Effective Communication - II	19UE2	6	3	3	25	75	100	
	III	Core Course - III (CC)	Modern Marketing	20UCC2CC3	6	5	3	25	75	100	
			Core Course - IV(CC)	Web Designing	19UCC2CC4	6	5	3	25	75	100
			Allied Practical - I (AP)	HTML Practicals	19UCC2AC1P	4	3	3	40	60	100
	IV		Environmental Studies	21UGES	2	2	3	25	75	100	
	V	Extra Credit Course	Swayam Online Course		As per UGC norms						
	Total			30	21				600		



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B.Com. Computer Applications – PROGRAMME STRUCTURE
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III Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
III	I	Language Course - III (LC)	Kappiyamum Nadagamum	19ULT3	6	3	3	25	75	100
			Communication in French - III	19ULF3						
			Prose, Textual Grammar and Vakyarachana	19ULS3						
			Medieval, Modern Poetry & History of Hindi Literature - 3	19ULH3						
	II	English Language Course III (ELC)	Reading and Writing for Effective Communication - I	19UE3	6	3	3	25	75	100
	III	Core Course - V (CC)	Business Accounting	19UCC3CC5	6	5	3	25	75	100
			Database Management Systems	19UCC3CC6	5	5	3	25	75	100
			Business Tools for Decision Making	19UCC3AC2	5	3	3	25	75	100
	IV	Non Major Elective - I	Elements of Insurance	19UCC3NME1	2	2	3	25	75	100
			Basic Tamil	19ULC3BT1						
Special Tamil			19ULC3ST1							
V	Extra Credit Course	Swayam Online Course		As per UGC norms						
		Total			30	21				600



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DEPARTMENT OF COMMERCE
B.Com. Computer Applications – PROGRAMME STRUCTURE
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IV Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
IV	I	Language Course - IV (LC)	Pandaiya Elakkiyam	19ULT4	6	3	3	25	75	100	
			Communication in French - IV	19ULF4							
			Drama, History of Drama Literature	19ULS4							
			Letter Writing, General Essays, Technical Terms, Proverbs, Idioms & Phrases, Hindi Literature - 4	19ULH4							
	II	English Language Course IV (ELC)	Reading and Writing for Effective Communication - II	19UE4	6	3	3	25	75	100	
	III	Core Course - VII (CC)	Cost Accounting	19UCC4CC7	6	6	3	25	75	100	
			Core Practical - I (CP)	Database Management Systems - Practicals	19UCC4CC1P	4	4	3	40	60	100
			Allied Course - III (AC)	Business Law	19UCC4AC3	4	3	3	25	75	100
	IV	Non-Major Elective - II	Advertisement Management	19UCC4NME2	2	2	3	25	75	100	
			Basic Tamil	19ULC4BT2							
			Special Tamil	19ULC4ST2							
	V	Skill Based Elective - I	A. Accounting Fundamentals with Tally (Practical)	21UCC4SBE1AP	2	2	3	40	60	100	
			B. Creative Advertising (Practical)	21UCC4SBE1BP							
VI	Extra Credit Course	Swayam Online Course		As per UGC norms							
		Total			30	23				700	



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DEPARTMENT OF COMMERCE

B.Com. Computer Applications – PROGRAMME STRUCTURE
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V Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total	
								Internal	External		
V	III	Core Course - VIII (CC)	Accounting for Managerial Decisions	19UCC5CC8	5	5	3	25	75	100	
		Core Course - IX (CC)	R for Data Analysis	19UCC5CC9	5	5	3	25	75	100	
		Core Course - X (CC)	Entrepreneurial Development	19UCC5CC10	5	5	3	25	75	100	
		Core Practical - II (CP)	R Programming - Practicals	19UCC5CC2P	5	5	3	40	60	100	
		Major Based Elective - I	A. Business Correspondence & Reporting	19UCC5MBE1A	4	3	3	25	75	100	
	B. E-Retailing		19UCC5MBE1B								
	IV	Skill Based Elective - II	A. Tally ERP (Practical)	21UCC5SBE2AP	2	2	3	40	60	100	
			B. Digital Designs for Business Application (Practical)	19UCC5SBE2BP							
		Skill Based Elective - III	A. Commerce - Practical	21UCC5SBE3AP	2	2	3	40	60	100	
			B. Skills for Competitive Examination	19UCC5SBE3B				-	100		
		UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100	
	V	Extra Credit Course	Swayam Online Course		As per UGC norms						
		Total			30	29					800



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DEPARTMENT OF COMMERCE

B.Com. Computer Applications – PROGRAMME STRUCTURE
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VI Semester

Semester	Part	Course	Title	Subject Code	Hours	Credit	Exam Hours	Marks		Total
								Internal	External	
VI	III	Core Course - XI (CC)	Corporate Accounting	19UCC6CC11	6	5	3	25	75	100
		Core Course - XII (CC)	Income Tax Theory Law & Practice	19UCC6CC12	6	5	3	25	75	100
		Major Based Elective - II	A. Human Resource Management	19UCC6MBE2A	5	4	3	25	75	100
			B. Modern Banking	19UCC6MBE2B						
		Major Based Elective - III	A. Auditing	19UCC6MBE3A	6	4	3	25	75	100
			B. Management Information System	19UCC6MBE3B						
		Project	Project Work	21UCC6PW	6	5	3	-	-	100
	V		Extension Activities	19UGEA	-	1	-			
			Gender Studies	19UGGS	1	1	3	25	75	100
			Total			30	25			600
		Grand Total			180	140				3900

CORE COURSE – I

PRINCIPLES OF ACCOUNTANCY

2019 – 2020 Onwards

Semester - I	Principles of Accountancy	Hours/Week - 6	
Core Course - I		Credits - 5	
Course Code - 19UCC1CC1		Internal 25	External 75

Course Objective

- To equip the students with fundamental knowledge and acquire analytical skills on the accounting concepts.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the accounting concepts and conventions.	K1
CO2	Explain the objective and causes of depreciation and to determine the annual depreciation.	K2
CO3	Develop the skills in preparation of final accounts of Non-profit organization and to find out profit under single entry system.	K3
CO4	Summarize the consignment transaction in the books of consignor and consignee and ascertain the profits of joint venture under different sets of accounts.	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit - I Introduction to Book Keeping (18 Hours)

Book Keeping- Accounting concepts and conventions - Accounting Standards – Double entry system – Journal, Ledger and Trial Balance -Subsidiary books – Bank Reconciliation Statement.

Unit - II Final Accounts (18 Hours)

Final Accounts of sole traders with adjustment entries – Rectification of Errors.

Unit - III Non-Trading Concerns**(18 Hours)**

Accounts of Non-Trading Concerns – Receipts & Payment Account – Income & Expenditure Account - Bills of Exchange – Average Due Date – Account Current.

Unit - IV Consignment & Joint Venture**(18 Hours)**

Consignment Accounts – Features – Difference between consignment and sale – Accounting treatment in the books of consignor and consignee. Joint Venture – Distinctions between Joint venture and Partnership – Distinction between Joint venture and Consignment – Methods.

Unit - V Accounting for Incomplete Records & Depreciation**(18 Hours)**

Single Entry System – Net Worth method – Conversion method – Depreciation – Methods of calculating amount of depreciation, provisions and reserves.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	T.S. Reddy and A. Murthy	Financial Accounting	Margham Publication	2011
2.	S.P. Jain and K.L. Narang	Advanced Accounting	Kalyani Publishers	2014
3.	Dalston L. Cecil & Jenitra L. Merwin	Principles of Accountancy	Learn Tech Publishers	2010

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	N. Vinayagam and B. Charumaki	Financial Accounting	Sultan Chand & Co	2008
2.	P.C. Tulsian	Financial Accounting	Tata MC Graw Hill Ltd.	2003

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. D. Ramya – Assistant Professor, Department of Commerce.

CORE COURSE – II

MODERN MANAGEMENT CONCEPTS

2019 – 2020 Onwards

Semester - I	Modern Management Concepts	Hours/Week - 6	
Core Course - II		Credits - 5	
Course Code - 19UCC1CC2		Internal 25	External 75

Course Objective

- The course facilitates the students to understand about the functional areas of management.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define and identify the concepts of modern management	K1, K2
CO2	Understanding the planning and decision making	K2
CO3	Build the co-ordination and control among the organization	K3
CO4	Examine the recent era in modern management	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	M	M	S	S	S
CO3	M	M	S	S	S
CO4	M	M	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Management (18 Hours)

Management – Definition - Meaning – Nature and Scope - Functions, Skills of a Manager, Process of Management, Pioneer thoughts of management ; contribution of Henry Fayol and F.W. Taylor – George Elton Mayo – Douglas Mc Gregor – Renisis Likert – Mary Parker Follett – Chester I Barnard - Chris Argyris – Herbert A Simon - Peter F. Drucker.

Unit – II Planning and Decision making (18 Hours)

Planning – Nature – Process, Types, Importance; Decision making: types of Decision, Process of decision making, Models & Issues.

Unit – III Organizing**(18 Hours)**

Organization - Structure and Types - Departmentation, Decentralization, Delegation, Span of management - Line & Staff Organization - Matrix Organization.

Unit – IV Co-ordinating and Controlling**(18 Hours)**

Co-ordination and Controlling – Principle – Process, Control – Tools and Techniques – MBO (Management by Objectives) – MBE (Management by Exception) – MBP (Management by Participation) - MBS (Management by Systems).

Unit – V Recent Trends in Management**(18 Hours)**

Contemporary Issues – Role of Managers in changing environment – Contemporary Organizational Structure, Trends in Management- Challenges in today’s global environment and competitiveness.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	C .B. Gupta	Business Management	S.Chand& Sons	2012
2.	Ricky W Griffin	Management	Western College Publication	2006

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Koontz, O’Donnel&Wehrich	Essentials of Management	Tata McGraw-Hill	2012
2.	Robbins & Coulter	Management	Pearson	2019
3.	Stoner & Freeman	Principles of Management	Chandra Bose (PHI)	1991
4.	Gareth Jones & Jennifer George	Contemporary Management	McGraw-Hill/Irwin	2016

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar, Activity & Group Discussions.

Course Designer

Ms. B. Lavanya – Assistant Professor, Department of Commerce.

ALLIED COURSE – I

FUNDAMENTALS OF COMPUTER & INTERNET

2020 – 2021 Onwards

Semester - I	Fundamentals of Computer & Internet	Hours/Week –4	
Allied Course - I		Credits –3	
Course Code - 20UCC1AC1		Internal 25	External 75

Course Objective

- At the end of the course the students shall be able to get the basic knowledge about computer, memory, input and output devices, OS, networks and internet.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the fundamental concepts of computer and parts	K1
CO2	Describe the concepts of operating system and memory management	K2
CO3	Apply the real time usage of internet	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	M	S
CO2	M	S	S	S	S
CO3	M	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Basics of Computer

(12 Hours)

Introduction – Digital and Analog computers – Characteristics of Computer – History of computer – Generation of computer – Classification of computer – The computer system – Application of computers. Computer memory: Introduction – Memory Representation – Memory Hierarchy – CPU Registers – Cache Memory – Primary memory – Secondary Memory.

Unit – II Input, Output devices & OS Management

(12 Hours)

Introduction – Input-output unit – Input devices – Output devices – Operating System(OS): Introduction – Objectives of OS – Type of OS – Function of OS – Examples of Operating System.

Unit – III Computer Networks

(12 Hours)

Data communication and computer Network: Computer networks – Network types – LAN Topologies – Communication Protocol – Network Devices – Wireless Networking.

Unit – IV The Internet**(12 Hours)**

Introduction – History of Internet – Internetworking Protocol – The Internet Architecture – Managing the Internet – Connecting to Internet – Internet Connections – Internet Addresses.

Unit – V Internet Services**(12 Hours)**

World Wide Web – Electronic Mail - File Transfer Protocol – Terminal Network – News – Internet Relay Chat – Uses of Internet.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Anita Goel	Computer Fundamentals	Dorling Kindersley (India) Pvt. Ltd	2010

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dr.Shalii Jain, M.Geeta	Course on computer Concepts	BPB Publications	2016
2.	Paul E. Hoffman	The Internet Instance Reference	BPB Publications	2016

Pedagogy

Lecturer, Power Point Presentation, Assignment, Quiz, Seminar, Group Discussion & Google Classroom

Course Designer

Ms. V. Yasodha – Assistant Professor, Department of Computer Applications.



CAUVERY COLLEGE FOR WOMEN (Autonomous), TIRUCHIRAPPALLI- 18

Applicable to the candidates admitted from the Academic year 2020-21 onwards

Part IV –UNIVERSAL HUMAN VALUES

Hours: 2

Course Code: 20UGVE

Credit: 2

Instructional Hours: 30

Semester	Course title	Category	Instructional Hours	Credits
I	Universal Human Values	Part IV	30	2

Course Objective

- This course inculcates the basic human values among the students so as to make them responsible citizens of the Nation.

Course Outcomes

On successful completion of the course the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth	K2
CO3	Explain the value of Non-violence	K3
CO4	Practice the values of Righteousness and Service	K3
CO5	Apply the values of Renunciation (sacrifice) & Peace	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	S	S
CO2	M	M	M	M	S
CO3	M	M	M	M	S
CO4	M	M	M	M	S
CO5	M	M	M	M	S

S – Strong; M – Medium; L – Low

Syllabus

Unit - I Love and Compassion

(5 Hours)

- **Introduction:** what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore

- Practicing love and compassion: what will learners learn gain if they practice love and compassion? What will learners lose if they Don't Practice love and compassion?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies

Unit - II Truth

(5 Hours)

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity, sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- Practicing truth: what will learners learn/ gain if they practice truth? What will learners lose if there Don't Practice it?
- Learners' individual and/ or group experience(s)
- Simulated situations
- Case studies

Unit - III Non – Violence

(5 Hours)

- **Introduction:** what is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore
- Practicing non-violence: What will learners learn/gain if they practice non- violence? What will learners lose if they don't Practice it?
- Sharing learner's individual and/ or group experience(s) about non - violence
- Simulated situations
- Case studies

Unit - IV Righteousness and Service

(8 Hours)

- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore
- Practicing Righteousness: What will learners learn/ gain if they practice righteousness and service? What will learners loose if they Don't Practice these values?
- Sharing learners individual and/ or group experience(s) regarding righteousness and service
- Simulated situations
- Case studies

Unit -V Renunciation (sacrifice) & Peace

(7 Hours)

- Introduction: what is renunciation? Renunciation and sacrifice. Self - restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace
- Practicing renunciation, sacrifice and Peace: What will learners learn/ again if they practice Renunciation, sacrifice and Peace? What will learners lose if there Don't Practice these values?
- Sharing learners individual and/ or group experience(s) about Renunciation, sacrifice and Peace
- Simulated situations
- Case Studies

CORE COURSE – III

MODERN MARKETING

2020 – 2021 Onwards

Semester - II	Modern Marketing	Hours/Week - 6	
Core Course - III		Credits - 5	
Course Code - 20UCC2CC3		Internal 25	External 75

Course Objective

- To acquaint the basic knowledge of marketing and equip them to contribute the emerging challenges of marketing.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Explain the basic concepts of marketing	K1,K2
CO2	Interpret about market segmentation, marketing mix and buyer behaviour	K2
CO3	Build knowledge about product planning and development.	K3
CO4	Analyze recent trends in marketing.	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	S	S	S
CO2	M	M	S	S	S
CO3	M	M	S	S	S
CO4	M	M	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction (18 Hours)

Definition of Market and Marketing, Types of market - Types of good - Evolution of marketing – Difference between selling and marketing – Modern concepts of marketing - Nature and importance of marketing- Functions of marketing. Service marketing – Meaning - Characteristics – Difference between goods and services – 7 P's of service marketing mix.

Unit – II Consumer Behaviour and Market Segmentation (18 Hours)

Consumer Vs. Customer- Importance of consumer behaviour –Buying process –Factor influencing consumer behaviour- Theories of buyer behaviour-7 O's frame work. Market segmentation – Criteria's of effective segmentation – Characteristics and benefits– Strategies opted for market segmentation.

Unit – III Product & Pricing**(18 Hours)**

Elements of marketing Mix – Product Policy New product development – Product life cycle – Branding and Packaging – Pricing – Factors affecting pricing – Kinds of pricing.

Unit – IV Channels of Distribution & Promotion**(18 Hours)**

Channels of distribution – Importance – Factor affecting choice of distribution – Channel members - Promotional Programme – Sales promotions – Advertising – Personal selling.

Unit – V E-Marketing**(18 Hours)**

Recent trends in marketing – E – Marketing – E – Retailing – Relationship marketing – Mobile marketing – Green marketing – Test marketing – Social media marketing – Guerilla marketing Digital marketing Neuro marketing – Plano gram marketing.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	R.S.N.Pillai&Bagavathi	Modern Marketing	S.Chand&Co	2010
2.	N. RajanNair ,Sanjith R Nair	Marketing	Sultan Chand&Sons	2015

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.A.Sherlekar, R.Krishnamoorthy	Marketing Management	Himalaya Publishing house	2010
2.	Dhruv Grewal	Marketing	TataMcGrawHill India	2018
3.	PhilipKotler	Marketing Management	Sultan Chand&Sons	2015

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussion.

Course Designer

Ms. D. Indumathi – Assistant Professor, Department of Commerce.

CORE COURSE – IV

WEB DESIGNING

2019 – 2020 Onwards

Semester - II	Web Designing	Hours/Week - 6	
Core Course - IV		Credits - 5	
Course Code - 19UCC2CC4		Internal 25	External 75

Course Objective

- This course will introduce you to the realm of web design. The first and necessary step for that goal is to understand how HTML works.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Recall the concepts of Internet	K1
CO2	Understand the HTML web page tags	K2
CO3	Analyse graphics and tables in web pages	K3
CO4	Develop a website using frames and form elements	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	M	M
CO2	M	S	M	M	M
CO3	M	S	M	M	M
CO4	M	S	M	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – Introduction to Internet

(18 Hours)

Introduction to Internet –World Wide Web (WWW) – Web Page – Hyper Text – Net Surfing – Internet/Web Browsing – Browser – Internet Addressing – IP Address – Domain Name – Electronic Mail – Uniform Resource Locator (URL) – Internet Protocols – TCP/IP – FTP – HTTP.

Unit – II HTML

(18 Hours)

Introduction to HTML –Head and Body Sections- Designing the Body Section- Ordered and Unordered Lists.

Unit – III Links and Table Tags**(18 Hours)**

Links – Link to another Web Page – The Anchor Tag-Absolute and Relative Linking–Intra-Page Linking-Mail Links-Using Multiple Links on a Page. Tables –Importance of Tables- Create a Table – Understanding Table Tag Attributes- Nested Tables.

Unit – IV Images and Frames**(18 Hours)**

The IMG Tag-Image Tag Attributes-Floating Images-Linking Images-Aligning Multiple Images.Working with Frames–The Frameset- Building a Framed Page-Setting FRAMESET and FRAME Tag Attributes-Exploring a Frame with Margin, Resize and Scroll Controls –Working with Borderless Frames – Advanced Frame Concepts-Designing Fixed and Dynamic Frames – The NOFRAMES Tag– Inline Frame.

Unit – V Forms**(18 Hours)**

Introduction to Forms – Action Attribute- Method Attribute- Enctype Attribute- Text Box – Large Text Area – Check Boxes – Radio Buttons – Menu – Upload Files – Submit and Reset Button – Hidden Field – Organize Form Elements – Label Form Elements.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Alexis Leon & Mathews Leon	Internet for Everyone	Leon Tech World, Chennai	1998
2.	C.Xavier	World Wide Web Design with HTML	Tata McGraw-Hill	2004
3.	Molly E. Holzschlag	Special Edition Using HTML 4 , 6 th Edition	Que Pub	2000

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	John Zabour, Jeff Foust & David Kerven	HTML 4 HOW- TO	BPB Publications	2001
2.	Deborah S.Ray, Eric J.Ray,	Mastering HTML 4, 1 st Edition,	BPB Publications	2000

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. H. Krishnaveni – Associate Professor, Department of Computer Applications.

ALLIEDPRACTICAL– I

HTML - PRACTICALS

2019 – 2020 Onwards

Semester - II	HTML Practicals	Hours/Week - 4	
Allied Practical - I		Credits - 3	
Course Code - 19UCC2AC1P		Internal 40	External 60

Course Objective

- To impart Practical Training in web page designing using HTML.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Design a webpage using basic HTML tags	K4
CO2	Navigation between web pages using form elements and frame tags	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	M	M
CO2	M	S	M	M	M

S – Strong; M – Medium; L - Low

Syllabus

List of Programmes:

Develop a webpage using

- 1) Develop a web using
- 2) Back ground design and text color
- 3) Link tags
- 4) Ordered list and Unordered list
- 5) Image tags
- 6) Nested tables
- 7) Form elements
- 8) Frames and frame sets

Pedagogy

Lecture & Power Point Presentation.

Course Designer

Ms. H. Krishnaveni – Associate Professor, Department of Computer Applications.



CAUVERY COLLEGE FOR WOMEN (Autonomous), TIRUCHIRAPPALLI- 18
(Applicable to the candidates admitted from the Academic year 2021-22 onwards)

ENVIRONMENTAL STUDIES

Hours: 2
Course Code: 21UGES

Credit: 2
Instructional Hours: 30

SEMESTER	COURSE TITLE	CATEGORY	INSTRUCTIONAL HOURS	CREDITS
II	Environmental Studies	PART IV	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Outline the nature and scope of environmental studies	K2
CO2	Illustrate the various types of natural resources and its importance	K2
CO3	Classification of various types of ecosystems with its structure and function	K2
CO4	Develop an understanding of various types of pollution and biodiversity	K3
CO5	List out the various types of social issues related with environment	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	M	M	S
CO3	S	S	S	S	S
CO4	S	S	M	S	S
CO5	S	S	M	S	S

S – Strong; M – Medium; L – Low

Unit: I Introduction to environmental studies
Definition, scope and importance. Need for public awareness

(6 Hours)

Unit: II Natural Resources: (6 Hours)

Renewable and non-renewable resources:

- a) Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.
- e) Land resources: Land as a resource, land degradation, man induced Landslides, soil erosion and desertification.

Role of an individual in the conservation of natural resources.

Unit: III Ecosystems (6 Hours)

- Concept, Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem and Ecological succession.
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

Unit: IV Biodiversity and Environmental Pollution (6 Hours)

- Introduction, types and value of biodiversity
- India as a mega diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Definition, Causes, effects and control measures of :
 - a. Air Pollution
 - b. Water Pollution
 - c. Soil Pollution
 - d. Noise pollution
 - e. Nuclear hazards
- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- Role of an individual in prevention of pollution
- Disaster management: floods, earthquake, cyclone and landslides.

Unit: V Social Issues and the Environment

(6 Hours)

- Water conservation, rain water harvesting, watershed management.
- Climate change, global warming, acid rain, ozone layer depletion,
- Wasteland reclamation.
- Environment Protection Act
- Wildlife Protection Act.
- Forest Conservation Act.
- Population explosion – Family Welfare Programmes
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clanderson Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub. House, Delhi 284 p.
12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639 p.
13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)
14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p
16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt Ltd 345 p.
17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science (TB)
20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media (R).
21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications (TB)
22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA 499 p

CORE COURSE – V
BUSINESS ACCOUNTING
2019 – 2020 Onwards

Semester – III	Business Accounting	Hours/Week – 6	
Core Course–V		Credits –5	
Course Code –19UCC3CC5		Internal 25	External 75

Course Objectives

- To understand how to maintain books of recording under Hire Purchase and Instalment Method.
- To enable the students to prepare different kinds of Financial Statements.
- To understand different types of Branches.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Understanding the Accounting Principles adopted in a Partnership Firm	K1
CO2	Explain the methods of dissolution of the Partnership Firm	K2
CO3	Prepare the transactions of Branch Accounts and Departmental Accounts	K3
CO4	Infer the accounting procedures related to Fire Insurance Claim, Hire Purchase, Instalment Accounting and Royalty accounts	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Partnership Accounts (18 Hours)

Admission of a Partner – Retirement of a Partner – Death of a Partner.

Unit – II Dissolution of Firm (18 Hours)

Dissolution of Firm – Insolvency of Partner – Insolvency of All Partners – Garner Vs. Murray – Gradual Realization of Assets and Piecemeal Distribution.

Unit – III Branch & Departmental Accounts (18 Hours)

Branch Accounts – Dependent Branch – Debtor System – Stock and Debtor System – Final Accounts System – Wholesale Branches – Independent Branches (Excluding Foreign Branches) – Departmental Accounts.

Unit – IV Hire Purchase & Instalment Accounts (18 Hours)

Hire Purchase Accounts – Default and Repossessions – Hire Purchase Trading Accounts – Instalment Purchase Accounts.

Unit – V Insurance Claims & Royalty Accounts (18 Hours)

Insurance Claims for Loss of Stock and Profit – Royalty Accounts.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	T.S. Reddy & Murthy A	Financial Accounting	Margham Publishers	Reprint 2018
2.	S.P. Jain & K.L. Narang	Advanced Accounting	Kalyani Publishers	Reprint 2016

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.N. Maheshwari	Advanced Accounting	Vikash Publishers	10 th Edition

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Dr. D. Sarala – Assistant Professor, Department of Commerce.

CORE COURSE – VI

DATABASE MANAGEMENT SYSTEMS

2019 – 2020 Onwards

Semester – III	Database Management Systems	Hours/Week – 5	
Core Course–VI		Credits –5	
Course Code –19UCC3CC6		Internal 25	External 75

Course Objectives

- To provide the essentials knowledge about the database systems and also to understand the various Database Concepts.
- To learn and practice data modeling using the entity-relationship and developing Database Designs.
- To understand the needs of Database Design.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Describe the Data Models with Relationships and Transaction Management.	K1
CO2	Illustrate the principles of Functional Dependencies, Normalization, Relational Algebra and Relational Calculus.	K2
CO3	Implement Operators in database queries and sub queries.	K3

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	S	S	S

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Introduction to Database Management Systems

(15 Hours)

Information – Data and Data Management – File-based Data Management –Database Systems – Why a database? – Comparison between Database and File Processing Systems – Organization of a Database – Characteristics of Data in a Database – Database Management Systems (DBMS): Benefits of using DBMS – Functions of DBMS – Components of a DBMS – Data Dictionary – Database users.

Unit – II Database Architecture and Design**(15 Hours)**

Introduction – Database Architecture – Data Abstraction – ANSI/SPARC Architecture – Database Languages – Database Design – Design Constraints – Data Models: Introduction – Conceptual, Physical and Logical Database Models – E-R Model: Advantages – Disadvantages – Entity – Relationship(E-R) Modeling: Components of an E-R Model – Relationships – E-R Diagrams(ERDS): Types of E-R Diagrams – E-R Modeling Symbols.

Unit – III Relational Database Management Systems (RDBMS)**(15 Hours)**

RDBMS Terminology – The Relational Data Structure – Codd’s Rules – Relational Data Integrity and Database Constraints: Introduction – Integrity Constraints – Data Normalization: Pitfalls in Relational Database Design – Decomposition – Functional Dependencies – Normalization – Keys – Relational Algebra – Relational Calculus.

Unit – IV Structured Query Language (SQL)**(15 Hours)**

Characteristics of SQL – Advantages of SQL – Types of SQL Commands – SQL Operators – Arithmetic Operators – Comparison Operators – Logical Operators – Set Operators – Tables, Views and Indexes – Queries and Subqueries.

Unit – V Structured Query Language (SQL)**(15 Hours)**

Aggregate Functions – Insert, Update and Delete Operations – Joins and Unions – Transaction Management and Concurrency Control: Introduction – Transactions – Transaction Properties (ACID Properties) – Database Structure – Transaction States – Concurrency Control.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Alexis Leon, Mathews Leon	Essentials of Database Management Systems	Tata McGraw Hill Education India Pvt. Ltd.	Revised Edition 2009

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Abraham Silbers Chatz, Henry F. Korth, S. Sudharsan	Database System Concepts	Tata McGraw Hill Education India Pvt. Ltd.	6 th Edition
2.	Elmasri & Navathe Addison & Weisely	Fundamentals of Database Systems	Hi Elmasri & Navathe Addison & Weisely Publication Himalaya Publishing House, Mumbai	7 th Edition
3.	C.J. Date	Database Systems	Pearson Education	8 th Edition

			Dorling Kindersley(India) Pvt., Ltd.	
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Web References:

1. www.tutorialspoint.com/dbms
2. www.guru99.com/dbms-tutorials
3. www.W3Schools.in/dbms
4. beginnersbook.com/2015/04/dbms-tutorials

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. Anandhavalli - Assistant Professor, Department of Computer Applications.

ALLIED COURSE – II

BUSINESS TOOLS FOR DECISION MAKING

2019 – 2020 Onwards

Semester – III	Business Tools for Decision Making	Hours/Week – 5	
Allied Course–II		Credits –3	
Course Code –19UCC3AC2		Internal 25	External 75

Course Objectives

- To impart the basis in statistics to help students acquire new skills on the application of business tools.
- To Estimate the Mean and Standard Deviation of the Marginal Distribution of the response variable and use this information to inform a business decision.
- To obtain a point of estimate for variance and Standard Deviation.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall the basic concepts of Statistics	K1
CO2	Apply the formulas on Central Tendency and Dispersion	K2
CO3	Identify the linear relationship between the variables through Correlation and Regression	K3
CO4	Analyse the Time Series, Price and Quantity Index Numbers	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	M
CO2	S	S	S	S	M
CO3	S	S	S	S	M
CO4	S	S	S	S	M

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Introduction to Statistics (15 Hours)

Introduction– Definition – Importance and Scope of Statistics – Limitations of Statistics – Classification and Tabulation – Diagrammatic representation of Data – Bar and Pie Diagrams.

Unit – II Measures of Central Tendency (15 Hours)

Measures of Central Tendency – Mean, Median and Mode – Geometric Mean and Harmonic Mean – Weighted Arithmetic Mean. Measures of Dispersion: Range – Quartile Deviation – Mean

Deviation – Standard Deviation – Co-efficient of Variation – Combined Mean and Standard Deviation –Skewness (Karlpearson’s & Bowley’s Method only)

Unit – III Correlation & Regression (15 Hours)

Correlation – Karlpearson’s Co-efficient of Correlation – Spearman’s Rank Correlation Co-efficient – Regression – Properties of Regression Co-efficient and Regression lines.

Unit – IV Analysis of Time Series (15 Hours)

Components of Time Series – Measurement of Trend – Semi-Average Method – Moving Average Method – Least Square Methods

Unit – V Index Numbers (15 Hours)

Constructions of Index Numbers – Unweighted – Weighted Index Numbers – Laspeyre’s Method – Paasche’s Method – Bowley Method – MarshallEdgeworth Method – Fisher’s Method – Kelly’s Method – Quantity Index Numbers – Chain Index Numbers – Base Shifting – Consumer Price Index Number.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.P.Gupta	Statistical Methods	Sultan Chand and Sons Publishers	1980
2.	P.A. Navanitham	Business Statistics And Tools for Decision Making	Jai publishers	2017

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.C Gupta and V.K.Kapoor	Statistics	Sultan Chand and Sons Publishers	1980
2.	R.S.N. Pillai and Bagavathi	Statistics Theory and Practice	S.Chand and Company Ltd.	2016
3.	D. Joseph Anbarasu	Business Statistics	Vijay Nicole Imprints Pvt., Ltd.	2008
4.	S. L. Aggarwal & S. L. Bharadwaj	Tools and Decision Making	Kalyani Publishers	2014

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Dr. P. Kavitha – Associate Professor, Department of Commerce.

NON-MAJOR ELECTIVE – I

ELEMENTS OF INSURANCE

2019 – 2020 Onwards

Semester – III	Elements of Insurance	Hours/Week – 2	
Non-Major Elective–I		Credits –2	
Course Code –19UCC3NME1		Internal 25	External 75

Course Objectives

- To understand the concept and scope of Insurance.
- To implant the concept of General Insurance Principles and Practices of Insurance.
- To understand the risk and various Insurance Policies along with their structures and the legal dimensions involved.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the conceptual framework of Insurance.	K1
CO2	Explain the features and procedures of various types of Insurance Policies	K2
CO3	Identify the methods of premium calculation related to different schemes.	K3
CO4	Analyse the latest trends and challenges in Insurance	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	M
CO2	S	S	S	M	M
CO3	S	S	S	M	M
CO4	S	S	M	M	S

S – Strong; M – Medium; L - Low

Syllabus

Unit – I Introduction to Insurance (6 Hours)

Introduction to Insurance: Purpose and Need of Insurance – Insurance as a Social Security Tool – Insurance and Economic Development – Types of Insurance.

Unit – II Procedure for becoming an Agent (6 Hours)

Procedure for becoming an Agent: Pre-requisites for obtaining a License – Duration Of license – Cancellation of License – Revocation or Suspension/Termination of Agent Appointment – Code of Conduct – Unfair Practices.

Unit – III Fundamentals of Agency (6 Hours)

Fundamentals of Agency – Definition of an Agent – Agents Regulations – Insurance Intermediaries – Agents’ Compensation – IRDA

Unit – IV Functions of the Agent (6 Hours)

Functions of the Agent: Proposal Form and other forms for grant of cover – Financial and Medical Underwriting – Material Information – Nomination and Assignment – Procedure regarding Settlement of Policy Claims.

Unit – V Marine & Fire Insurance (6 Hours)

Fundamentals and Principles of Marine and Fire Insurance – Contracts of various kinds of Insurance – Insurable Interest – Actuarial science

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Dr. P. Periyasamy	Insurance	Tata McGraw Hill	2 nd Edition 2018

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	M.N Mishra	Insurance Principles and Practices	S.Chand& Co	22 nd Edition 2018
2.	Dr. P.K. Gupta	Insurance and Risk Management	Himalaya Publishing House, Mumbai	2017
3.	Kaninika Mishra	Fundamentals of Life Insurance, Theories and Application	Prentice Hall of India, New Delhi	2016

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. B. Lavanya – Assistant Professor, Department of Commerce.

CORE COURSE – VII
COST ACCOUNTING
2019 – 2020 Onwards

Semester – IV	Cost Accounting	Hours/Week – 6	
Core Course – VII		Credits – 6	
Course Code – 19UCC4CC7		Internal 25	External 75

Course Objective

- To familiarize the students with the basic concepts of cost and various methods and techniques of cost accounting.
- To make aware about cost structure and cost elements.
- To understand the concept of contract costing along with job and batch costing.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the fundamental concepts of Cost Accounting	K1
CO2	Explain the different methods of labour turnover and compute remuneration	K2
CO3	Identify relevant costs for different types of managerial decisions	K3
CO4	Analyse the various methods of overheads allocation and prepare reconciliation statement	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	S	M	M	M
CO3	S	S	M	M	S
CO4	S	S	M	M	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Cost (10 Hours)

Introduction – Evolution and Cost Accounting and Management Accounting – Cost Concepts – Classifications – Objectives and Advantages – Demerits of cost accounting – Methods and techniques – Cost unit – Cost centre – Cost sheet – Tender & Quotation.

Unit – II Material Cost (20 Hours)

Material Cost – Purchase Procedures – Stores Procedure – Receipts and Issue of Materials – Stores organization and layout – Inventory Control – Levels of Stock, Perpetual

Inventory, ABC Analysis, EOQ – Stores Ledger – Pricing of Materials Issues, FIFO, LIFO, HIFO, Simple and Weighted average.

Unit – III Labour Cost (20 Hours)

Labour Cost – Time recording and Time Booking – Methods of Remuneration and Incentive Scheme – Overtime and Idle time – Labour Turnover Types, Causes and Remedies.

Unit – IV Overheads (20 Hours)

Overheads – Collection, Classification, Allocation, Apportionment, Absorption – Recovery Rates – Over and Under Absorption – Activity Based Costing – Reconciliation of Cost and Financial Accounts

Unit – V Job Costing, Process Costing & Operating Costing (20 Hours)

Job Costing, Contract Costing – Process Costing (Normal Loss, Abnormal Loss and Gains) – Operating Costing.

Distribution of Marks: Theory 20% & Problem 80%

Text Book

S. No.	Authors	Title	Publishers	Year of Publication
1.	Jain & Narang	Cost Accounting	Kalyani Publications	Reprint 2015

Reference

S. No.	Authors	Title	Publishers	Year of Publication
1.	S.N. Maheswari	Principles of Cost Accounting	Sultan Chand & Sons	2017
2.	Bhagavathi & Pillai	Cost Accounting	Sultan Chand & Sons	2016
3.	Reddy T.S & Hari Prasad Reddy Y	Cost Accounting	Margham Publication	2018

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. J. Lalithambigai – Assistant Professor, Department of Commerce.

CORE PRACTICAL – I

DATABASE MANAGEMENT SYSTEMS - PRACTICALS

2019 – 2020 Onwards

Semester – IV	Database Management Systems – Practicals	Hours/Week – 4	
Core Practical – I		Credits – 4	
Course Code – 19UCC4CC1P		Internal 40	External 60

List of Practicals

1. DDL COMMANDS

To perform the following using DDL commands

- Creation of a table
- Alter the structure of the table
- Modify the table
- Drop the column.

2. DML COMMANDS

To perform table manipulation using DML commands.

3. CONSTRAINTS

Develop MySQL queries to implement the following constraints on the table

- Primary Key
- Foreign Key
- NOT NULL

4. LOGICAL OPERATORS

Develop MySQL queries to implement the following logical operations

- AND
- OR
- NOT

5. AGGREGATE FUNCTIONS

Develop MySQL queries to implement the following aggregate functions

- SUM ()
- AVG ()
- MAX ()
- MIN ()
- COUNT ()

6. STRING OPERATIONS

Develop MySQL queries to implement

- a) String operations using "%" b) String operations using “_”.

7. GROUPING and ORDERING OF DATA

Develop MySQL queries to implement the grouping and ordering of data.

8. NESTED QUERIES and SUB QUERIES

Develop MySQL queries to implement the concept of nested queries and sub queries.

9. VIEWS

Develop MySQL queries to implement the following view operations

- a) Create View b) Update View c) Drop

10. INDEX

Develop MySQL queries to implement the concept of creation and validation of index.

Course Designer

Ms. A. Anandhavalli – Assistant Professor, Department of Computer Applications.

ALLIED COURSE – IV

BUSINESS LAW

2019 – 2020 Onwards

Semester – IV	Business Law	Hours/Week – 4	
Allied Course – III		Credits – 4	
Course Code – 19UCC4AC3		Internal 25	External 75

Course Objective

- To provide a conceptual study about the framework of Indian Business Laws.
- To orient students about the legal aspects of business.
- To familiarize students with case laws related to business.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Define the concept of contract and state the law relating to Indian Contract Act	K1
CO2	Explain the different elements of contract, performance of contract and different modes of discharge of contract	K2
CO3	Illustrate the process for registration of partnership	K3
CO4	List out the objectives of competition act	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	S	M	M
CO4	S	M	S	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I The Indian Contract Act, 1872: General Principles of Contract (12 Hours)

Contract – Meaning & Definition – Nature of Contract – Characteristics and Kinds – Essentials of a Valid Contract – Offer and Acceptance – Consideration – Contractual Capacity – Free Consent – Legality of Objects – Void Agreements.

Unit – II The Indian Contract Act, 1872: Specific Contracts (12 Hours)

Performance of Contract – Modes of Discharge of a Contract – Breach and its Remedies – Contingent Contracts – Quasi Contracts – Contract of Indemnity and Guarantee – Contract of Bailment and Pledge – Contract of Agency.

Unit – III The Sale of Goods Act, 1930**(12 Hours)**

Formation of Contract of Sale – Sale & Agreement to Sell – Conditions and Warranties – Doctrine of Caveat Emptor – Transfer of Property – Passing of Property – Performance of Contract of Sale – Unpaid seller – Remedies for Breach of Contract of Sale – Auction Sale.

Unit – IV Partnership Act, 1932 & Limited Liability Partnership Act 2008 (14 Hours)

Nature and Characteristics of Partnership – Registration of a Partnership Firms – Types of Partners – Rights and Duties of Partners – Implied Authority of a Partner – Incoming and outgoing Partners – Mode of Dissolution of Partnership – The Limited Liability Partnership Act, 2008.

Unit – V Competition Act, 2002**(10 Hours)**

Objectives – Salient Features – Anti-Competitive Agreements – Prevention of abuse of dominant position – Combination – Competition Advocacy – Competition Commission of India.

Text Book

S. No.	Authors	Title	Publishers	Year of Publication
1.	N. D. Kapoor	Elements of Mercantile Law	Sultan Chand & Sons Private Limited, New Delhi	2014
2.	R. S. N. Pillai & Bagavathi	Business Law	S. Chand & Co. Ltd., New Delhi	2016

Reference

S.No.	Authors	Title	Publishers	Year of Publication
1.	P.C. Tulsian & Bharat Tulsian	Mercantile Law	Tata McGraw Hill Education India	2014
2.	P.P.S. Gogna	Mercantile Law	S. Chand & Co. Ltd., New Delhi	2005

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. D. Indumathi – Assistant Professor, Department of Commerce.

NON-MAJOR ELECTIVE – II
ADVERTISEMENT MANAGEMENT

2019 – 2020 Onwards

Semester – IV	Advertisement Management	Hours/Week – 2	
Non-Major Elective – II		Credits – 2	
Course Code – 19UCC4NME2		Internal 25	External 75

Course Objective

- To know the basic marketing communication and the processes.
- To understand the process involved in personal selling and its implications for relationship development.
- To comprehend the ethical issues and social aspects of advertising.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall the conceptual framework of advertising	K1
CO2	Explain the formulation of advertising through effective marketing strategy to promote the product and service for economic development	K2
CO3	Identify the recent era in advertising and its powerful tools	K3
CO4	Analyze the ethical issues and social aspects of advertising	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	S	S	S	S
CO3	M	S	S	S	S
CO4	M	S	S	S	S

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction to Advertising (6 Hours)

Advertising – Definition – Objectives, Scope and Types – Role & Significances – Advertising an element of Marketing Mix – Communication Process in Advertising.

Unit – II Technological Aspects (6 Hours)

Advertisement Message, Themes, Appeal, Structure, Copywriting and Layout – DAGMAR Approach, Determination of Target Audience – Building of Advertising Programme – Message, Headlines, Copy, Logo, Illustration, Appeal and Layout.

Unit – III Advertising Media**(6 Hours)**

Media Planning, Electronic Media, Buying Advertising Aids, Trademarks, Slogans, Packaging, Pop - Up Displays, Premiums, Free Samples etc.

Unit – IV Advertising Agencies**(6 Hours)**

Advertising Agencies: Selection, Compensation and Appraisal of an Agency – Methods of Measuring Advertising Effectiveness – Developing Corporate Image – Techniques, Concepts and Practices.

Unit – V Advertising in India**(6 Hours)**

Role of Advertising in Modern Business - Economic, Social and Ethical aspects of Advertising and Advertising Goals – Recent Developments and Issues in Advertising.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	S.L. Gupta & V.V. Ratna	Advertising and Sales Promotion Management, An Indian perspective Text and Cases	Sultan Chand & Sons, New Delhi	2004

Reference Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Ruchi G.	Advertising Principles & Practice	S.Chand & Company Ltd, Delhi	2012
2.	Dr. Ansuya. Angadi	Advertising & Sales Management	Sri Siddalingeshwara Prakashana, Gulbarga	2010
3.	Aaker, David A., Rajeev Batra and John G. Mayers	Advertising Management	Prentice Hall of India Pvt. Ltd., New Delhi	2001

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions.

Course Designer

Ms. Shilpa A. Talreja – Assistant Professor, Department of Commerce.

Unit – III Account groups and ledgers (6 Hours)

Hierarchy of account groups and ledgers, reserved account groups, account groups balance sheet – Account groups of liabilities, account groups of assets account groups of profit & loss account – Account groups of direct income and direct expenses apart from sale and purchases, indirect income and indirect expenses account masters – Account groups creation and account ledgers creation – Feeding of opening balances, alteration / deletion of account master records – Feeding of closing stock value

Unit – IV Grouping of accounts (6 Hours)

Creation – Accounts and inventory – Entering transactions: Vouchers – Types – Numbering – Deleting and Editing vouchers – Opening and closing balances – Stock valuation

Unit – V Reports (6 Hours)

Petty cash book – Trial balance – Profit and loss account – Balance sheet – Group wise - Accounts wise – Data range reports – Stock reports – Budget variance reports – Transactions list – Accounts list.

List of Practicals:

1. Creation, alteration and deletion of companies and user defined accounting groups.
2. Grouping of accounts.
3. Creation, alteration and deletion of ledger accounts.
4. Preparation of final accounts.
5. Voucher entries.
6. Creation, alteration and deletion of inventory masters.
7. Generating accounting and inventory reports.
8. Bank Reconciliation Statement

Reference

S.No.	Authors	Title	Publishers	Year of Publication
1.	A.K. Nadhani	Implementing Tally	BPB Publications	2019
2.	S. V. Srinivasa Vallabhan	Computer Application in Business	Sultan Chand and Sons	2018
3.	Mohan Kumar K & Rajkumar S	Computer Applications in Business	Vijay Nicole Imprints (P) Ltd	2009

Pedagogy

Lecture, Lab demonstration and Power Point Presentation.

Course Designer

Ms. J. Lalithambigai, Assistant Professor, Department of Commerce.

SKILL BASED ELECTIVE – I

B. CREATIVE ADVERTISING (PRACTICAL)

2021 – 2022 Onwards

Semester – IV	Creative Advertising (Practical)	Hours/Week – 2	
Skill Based Elective – I		Credits – 2	
Course Code – 21UCC4SBE1BP		Internal 40	External 60

Course Objective

- To understand the communication process that takes place while advertising and to analyse it from the view point of a customer.
- To highlight the importance of advertising as a business strategy.

Course Outcome

On the successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Recall basic concepts of advertisement	K1
CO2	Explain how creativity can be incorporated in an advertisement	K2
CO3	Develop advertising media buying and planning strategies	K3
CO4	Analyse effective visual communication for various advertising approaches that combine the use of print, online/digital, and other multimedia communication	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	M	M	M
CO3	M	S	M	M	M
CO4	M	M	M	M	M

S – Strong; M – Medium; L – Low

Syllabus

Unit – I Introduction (6 Hours)

Creative Advertising Meaning – definition of marketing and advertising – functions of advertising – communication and persuasion process – human communication process – advertising exposure model – applying communication process to advertising.

Unit – II Consumer Perception (6 Hours)

Consumer Behaviour – consumer decision making process – consumer perception process.

Unit – III Creative Advertising (6 Hours)

Creativity in advertising, creative thinking – Creative process – Appeals – Copy Writer – Copy Writing – Print Copy elements, Headlines – body Copy – Slogan elements of design and principles of design.

Unit – IV Designing (6 Hours)

Designing Print Ad – choosing format – designing page – choosing typefaces – working with visuals – lay-out ready for print.

Unit – V Advertising Strategy (6 Hours)

Advertising and Media strategy – Role of Media; types of media, their advantages and Disadvantages, media planning, selection & scheduling strategies.

Text Book

S.No.	Authors	Title	Publishers	Year of Publication
1.	Chunawalla & K. C. Sethia	Foundation of Advertising Theory & Practice	Himalaya Publishing House, New Delhi	2000
2.	William H. Bolew	Advertising	John Wiley & Sons New York	1995
3.	Courtland Bovee John Thill & George Dovel	Advertising Excellence	Tata Mc Graw Hill Publications, New Delhi,	1995

Pedagogy

Lab demonstration, Power Point Presentation and Activity

Course Designer

Ms. S. Praveena, Assistant Professor, Department of Commerce.

**CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
Nationally Accredited with 'A' Grade by
NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI**

**PG & RESEARCH DEPARTMENT OF
COMMERCE**



**M.Com.
SYLLABUS
2022 -2023 and Onwards**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG & RESEARCH DEPARTMENT OF COMMERCE

VISION

Commitment to pursue excellence in commerce education, while equipping students with knowledge and skills in commerce stream, inculcate values, identify hidden talents, provide opportunities for students to realize their full potential and thus shape them into national assets, and to pursue a real holistic development, integrity moral and ethical uprightness.

MISSION

- To promote excellent education in the changing environment of information and communication technology and commerce sectors.
- Creating an urge in students to take up entrepreneurship in online to be successful by standing on their feet instead of being dependent on others.
- Grooming youth to become a truly global personality well equipped to deal with the modern world and its challenges.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.COM. PROGRAMME

PO NO.	On completion of M.Com. Programme, the students will be able to
PO 1	GENERIC AND DOMAIN KNOWLEDGE Articulate, illustrate, analyse, synthesis and apply the knowledge of principles and frameworks of commerce and allied domains to the solutions of different business scenario.
PO 2	CRITICAL THINKING AND PROBLEM SOLVING Conduct investigation of multi-dimensional business problems using research based knowledge and provide innovative solutions frameworks to real world complex problems.
PO 3	ENTREPRENEURSHIP AND EMPLOYMENT SKILLS Identify entrepreneurial opportunities to create and manage startups as well as professionalizing and growing family businesses.
PO 4	LEADERSHIP AND TEAM WORK Collaborate in an organizational context and across organizational boundaries and lead themselves in the achievement of organizational goals and optimize outcomes for all stakeholders.
PO 5	SOCIAL RESPONSIVENESS AND ETHICS Exhibit a broad appreciation of the ethical and value sustaining of managerial choices in political, cross-cultural, globalized, digitized and socio-economic environment.

PROGRAMME SPECIFIC OUTCOMES FOR M.COM.

PSO NO	Programme Specific Outcomes Students of M.Com. will be able to	POs Addressed
PSO 1	Gain an in-depth understanding of core and functional management concepts, business environment and domain specific knowledge.	PO1
PSO 2	Develop skills for analyzing of the business data, application of relevant analysis and problem solving in other functional areas such as marketing, finance, business strategy, human resources and information technology.	PO1 PO2
PSO 3	Inculcate entrepreneurship and managerial skills to establish and manage the business efficiently.	PO3
PSO 4	Ability to apply knowledge, skills and right attitude necessary to provide effective leadership in a global environment and to develop proactive thinking so as to perform efficiency in the dynamic socio-economic and business eco-system.	PO4 PO5
PSO 5	Develop competent professionals with strong ethical values, capable of a pivotal role in various sectors of the Indian Economy and Society, aligned with the national priorities.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18

DEPARTMENT OF COMMERCE

M.Com – PROGRAMME STRUCTURE

(For the Candidates admitted from the Academic year 2022-2023 onwards)

I Semester

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credit	Exam Hours	Marks		Total
							Internal	External	
I	Core Course – I (CC)	Corporate Finance	22PCO1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Economic and Environment Law	22PCO1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Strategic Management	22PCO1CC3	6	5	3	25	75	100
	Core Course – IV (CC)	Organizational Behaviour	22PCO1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course – I (DSE)	A. Business Ethics, Corporate Social Responsibility and Governance	22PCO1DSE1A	6	3	3	25	75	100
		B. Services Marketing	22PCO1DSE1B						
		C. International Human Resource Management	22PCO1DSE1C						
Total				30	23				500

***15 Days INTERNSHIP during Semester Holidays**

II Semester

Semester	Course	Title	Course Code	Inst. Hrs./ week	Credit	Exam Hours	Marks		Total
							Internal	External	
II	Core Course – V (CC)	Cost and Management Accounting	22PCO2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Business Analytics	22PCO2CC6	6	5	3	25	75	100
	Core Course – VII (CC)	Digital Marketing	22PCO2CC7	6	5	3	25	75	100
	Core Choice Course – I (CCC)	A. Security Analysis and Portfolio Management	22PCO2CCC1A	6	4	3	25	75	100
		B. Insurance and Risk Management	22PCO2CCC1B						
		C. Brand Management	22PCO2CCC1C						
	Discipline Specific Elective Course – II (DSE)	A. Logistics and Supply Chain Management	22PCO2DSE2A	6	3	3	25	75	100
B. Retail Management		22PCO2DSE2B							
C. Business Information System		22PCO2DSE2C							
	Internship	Internship	22PCOINT		2				100
	<i>Extra Credit Course</i>	<i>Swayam Online Course</i>				<i>As per UGC Norms</i>			
Total				30	24				600

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1CC1	CORPORATE FINANCE	CORE	6	5

Course Objective

- To make students understand various issues involved in financial management of a company and equip them with advanced analytical tools and techniques which can enhance their analytical ability for making sound financial decisions and policies in a company.

Prerequisite

Basic knowledge in Financial Management and Corporate Accounting.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and develop an understanding of the overall role and scope of finance function and apply the time value of money concepts	K1,K3,K5
CO2	Interpret and perform analytical reviews of financial results, proposals and plans.	K2, K5
CO3	Create financial discipline and select methods to improve the financial well being of an organizations.	K3, K5
CO4	Identify and construct an optimal capital structure, risk policy and payout policy to take better dividend decisions.	K3, K6
CO5	Analyze and develop knowledge of the legal, procedural and practical aspects of corporate restructuring and contemporary issues in management.	K4, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	2	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Corporate Finance – Meaning, Nature, Scope, Importance – Objectives of Financial Management; Measurement of Shareholders’ Wealth – Finance as a Strategic Function – Role of Finance Manager – Concepts of Risk, Return and Time Value of Money – Financial decision making and types of financial decisions – Risk – return trade off in Financial Decisions.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Capital Budgeting Decision – Nature, Significance and Types of Capital Budgeting Decisions – Capital Budgeting Process – Principles of Cash Flow Estimation – Estimation of Cash Flows – Capital Budgeting Techniques – Capital Budgeting decision under inflation – Capital Rationing and Multi period budget constraints – Capital budgeting decision under risk and uncertainty – Techniques for incorporating risk and uncertainty in Capital Budgeting Decisions – Risk adjusted Discount Rate Method (RADR) – Certainty equivalent Method – DCF Break Even Analysis – Simulation Method – Probability Distribution Method – Decision tree Analysis – Backward induction Method – Sensitivity Analysis and Scenario analysis.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Cost of Capital And Capital Structure Decision: Specific Costs Of Capital – Weighted Average Cost Of Capital, Weighted	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	<p>Marginal Cost Of Capital – Theories Of Capital Structure – Operating Income Theory – Traditional Theory – MM Hypothesis Without And With Corporate Taxes – Merton Miller Argument With Corporate And Personal Taxes – Trade Off Theory – Pecking Order Theory – Market Timing Theory – Signaling Theory And Effect Of Information Asymmetry On Capital Structure – Financial Leverage And Evaluation Of Financial Plans (EBIT – EPS Analysis) – The Concept Of Present Value Of Interest Tax Shield – Determination Of Beta Of Levered Firm And Optimal Capital Structure – Factors Affecting Choice Of Capital Structure In Practice.</p>			
IV	<p>Dividend Decision – Issues in dividend decision – Theories of relevance and irrelevance of dividend in firm valuation – Pure Residual Theory – Walter’s theory, Gordon’s Model, MM Hypothesis, Bird – in – hand theory and dividend signaling theory – relevance of dividend under Market Imperfections – Traditional and Radical Position on Dividend – Types of Dividend Polices in practice – Determinants of dividend policy in practice – Lintnet’s Model of Corporate Dividend Behavior – Working Capital Management – Concepts and Types of Working Capital – Operating Cycle and Cash Cycle – Estimation of Working Capital Requirement – Approaches of Working Capital Financing – Determinants of Working Capital – Components of Working Capital Management</p>	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

V	Corporate Restructuring and Contemporary Issues in Financial Management – Corporate restructuring and its various forms – Mergers and Acquisitions – Types, Motives, Benefits, Valuations and Financing – Leveraged Buyouts – Management Buyouts – Demerger, Split Up, Spin offs – Divestiture – Bases for calculation of Share Exchange Ratio – Determination of Minimum and Maximum Exchange Ratio – Contemporary Issues in Financial Management.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Agency Problem and Agency Cost - Capital Rationing – Optimal Capital Structure - Comparative analysis on dividend policies of Indian Companies, Foreign Companies and Foreign Direct Investment (FDI) - Recent Trends in Financial Management.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Distribution of Marks: Theory 40% and Problem 60%

Text Book

1. Pandey.I.M,(2012), Financial Management, 12th Edition, Vikas Publishing House Pvt., Ltd.
2. Khan, M.Y, (2011), Indian Financial System, 6th Edition, Tata McGraw Hill.
3. Krishnamurthy & Viswanathan, (2011), Advanced Corporate Finance, 3rd Edition, PHI Learning.

Reference Books

1. Richard A. Brealey, Stewart C. Myers & Mohanthy, (2011), Principles of Corporate Finance, 9th Edition , Tata McGraw Hill.
2. Brigham & Ehrhardt, (2011), Corporate Finance - A Focused Approach, 2nd Edition Learning.

3. Smart, Megginson, & Gitman, (2011), Corporate Finance, 3rd Edition ,Cengage Learning.
4. Besley, Brigham, Parasuraman, (2015), Corporate Finance, 3rd Edition, Cengage Learning.
5. Madura, (2014), International Corporate Finance, 10th edition, Cengage Learning,

Web References

1. <https://www.geektonight.com/corporate-finance-pdf/>
2. <http://library.ku.ac.ke/wpcontent/downloads/2011/08/Bookboon/Finance/corporate-finance.pdf>
3. <https://www.drnishikantjha.com/booksCollection/Merger%20Acquisition%20and%20Corporate%20Restructuring.pdf>
4. <http://www.jiwaji.edu/pdf/ecourse/commerce/UNIT4%20Capital%20Budgeting.pdf>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designers

Prof. Dr. N. Savithri

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1CC2	ECONOMIC AND ENVIRONMENT LAW	CORE	6	5

Course Objective

- To help the students to understand the laws related to Business and Corporate.

Prerequisite

Basic knowledge in Company laws.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify and point out the provisions, rules and regulations of companies act, competition act, foreign exchange management act and information technology act.	K1, K2, K4
CO2	Analyze the concepts, provisions of appointment of Board of Directors, conduct of various meeting, to discuss the various policies relating to act.	K2, K4
CO3	Discuss and summarize the legal aspects of various acts, to choose the disputes Redressal agencies, penalties and adjudication of various act.	K2, K3, K6
CO4	Relate and compare with latest amendments in various act, contraventions and penalties	K1, K4
CO5	Predict the concepts of laws in detail and to relate where and how it is applied in recent days.	K1, K2, K3, K5, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	3	2	2	3	3	3	2	3	2
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	3	2	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Provisions of Companies Act 1956, relating to Company Administration – Board of Directors – Managing Director – Independent Director – Provisions relating to various types of meeting - Latest Amendments in Companies Act 2013 relating to Company Administration and Governance	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Foreign Exchange Management Act, 1999 – Definition – Regulation and Management of Foreign Exchange – Authorized Persons – Contravention and Penalties – Adjudication and Penalties – Directorate of Enforcement	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	The Competition Act, 2002 – Introduction – Interpretation – MRTP versus Competition – Scope – Prohibition of Certain Agreements, Abuse of Dominant position and Regulation of Combinations	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	The Environment (protection) Act 1986 – Definition – Powers of the Central Government to Prevent and Control Environmental Pollutions – Appointing Officers. Consumer Protection Act 1986 – Definition – State and Central Consumer Protection Council – Disputes Redressal Agencies – District Forum – Appointment of Members – Appeal – State and Central Commission	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Information Technology Act 2000 - Introduction – Definition – Digital Signature – Certificates – Electronic Governance –	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	Regulations of Certifying Authorities – Duties of Subscriber – Penalties and Adjudication – The Cyber Regulation Appellate Tribunal – Offences – Power of State and Central Government to make Rules – Constitution of Advisory Committee			
VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Comparison on provisions of Companies Act 1956 and Companies Amendment Act 2013 and causes for amendment – Prevention of Money Laundering Act, 2002 – Competition Commission of India – Prevention of Black Marketing and Maintenance of Supplies of Essential Commodities Act, 1980 – Telecom Regulatory Authority of India Act, 1997.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Sharma J. P. (2012), Corporate Laws, 2nd Edition, Ane Books Pvt. Ltd, New Delhi.
2. Daniel Albuquerque, (2014), Legal Aspects of Business, 1st Edition, Oxford University, New Delhi.
3. Kuchhal M. C. (2018), Mercantile Law, 3rd Edition, Vikas Publishing House Pvt. Ltd.

Reference Books

1. Kapoor G. K. & Surl A. P. (2012) Corporate Laws, 3rd Edition, Taxman's Publications.
2. Kannel S. & Sowrirajan V. (2009) Company Law Procedure, 1st Edition, Taxman's Publications
3. Gower LCB, (2013), Principles of Modern Company Law, Stevens & Sons, 5th Edition, London
4. Raman B. S. (2008), Business Law, 3rd Edition, United Publishers

Web References

1. https://legislative.gov.in/sites/default/files/A1999-42_0.pdf
2. https://www.indiacode.nic.in/bitstream/123456789/13116/1/it_act_2000_updated.pdf
3. http://ncdrc.nic.in/bare_acts/consumer%20protection%20act-1986.html

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designers

Capt. Dr. P. Kavitha

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1CC3	STRATEGIC MANAGEMENT	CORE	6	5

Course Objective

- To furnish an integrated approach and also to utilize the organizational skills within the context of real – world business case studies.

Prerequisite

Basic knowledge in Organization Behaviour and Corporate Governance.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe and apply the various perspectives and concepts in the field of strategic management.	K1, K3
CO2	Predict the social responsibilities and ethics in strategic management and conclude the ethical decision making.	K2, K3, K6
CO3	Identify the basic concepts, principles and practices associated with strategy formulation, implementation and summarize the concepts to the solutions of business problems.	K3, K6
CO4	Identify the strategic issues and design appropriate courses of actions	K3, K6
CO5	Critically analyze the internal and external environment in which business operate and assess their significance for strategic planning.	K4, K5

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	3	3	3
CO2	2	2	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	2	2	2	2	2
CO4	2	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Overview of Strategic Management – Nature and Scope – Concepts – Characteristics – Approaches – Models – Elements in Strategic Management Process – Corporate Level Strategy – Corporate Vision, Mission and Objectives – Types – Strategy Formulation Process and Tools.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3 K4,K5,K6
II	Strategic Business Unit (SBU) – Operational, Financial, Marketing and Human Resource Strategy – Environmental Analysis – External environment and Internal Environment – Resource Based Strategy – Approaches – SWOT, GAP and Industry Analysis – Michael Porter’s Five Forces Model of Competition – Competitive Advantage – Resources, Capabilities and Competencies.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6
III	Strategic Implementation – Issues – Project Implementation – Procedural – Resource Allocation – Budgets – Organization Structure – Matching Structure and Strategy – Behavioural Issues – Corporate Culture – Values – Power – Building a Capable Organization – Functional Issues. Strategy Evaluation and Control – Importance – Establishing Strategic Controls – Operations Control and Strategic Control – Role of organizational Systems in Evaluation.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Responding to shifts in Competitive Advantages – New Development affecting Competitive Advantage – New Technology – New Distribution Channels, Economic Shift – Change in the Neighbouring Industries and change in	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6

	Government Regulations. Response Option – Prospecting, Defending and Harvesting			
V	Social Responsibility and Ethics in Strategic Management – Social Responsibility of Strategic Decision Makers – Responsibilities of Business Firm – Corporate Stakeholders – Ethical Decision Making.	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Strategic Planning Practices – Recent trends in Micro and Macro Environment – Problems of control system – Uncertainty – Impact of environmental development and ability to adjust – Reasons for Unethical Behaviour.		CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Thomas L. Wheelen & David Hunger. J, (2012), Concepts in Strategic Management and Business Policy toward Global Sustainability, 15th Edition, Prentice Hall.
2. Subba Rao. P, (2009), Strategic Management, 3rd Edition Himalaya Publications.

Reference Books

1. Rao. V.S.P (2008), Strategic Management – Text and Cases, 1st Edition, Excel.
2. Bhattacharya S.C, (2005), Strategic Management: Concepts and Cases, Wheeler Publishing, 1st Edition, NewDelhi.
3. John A. Pearce II, Richard B. Robinson Jr. & Amita Mital, (2010), Strategic Management– Formulation, Implementation and Control, 3rd Edition, Tata MC- Graw-Hill – Publishing CompanyLimited, New Delhi.
4. Arthur A. Thompson Jr. & Strickland A.J, (2010), Strategic Management, 3rd Edition, Mc Graw-Hill.

Web References

1. <https://www.basic-concept.com/c/basics-of-strategic-management>
2. <https://creately.com/blog/diagrams/swot-analysis-vs-gap-analysis/>
3. <https://online.hbs.edu/blog/post/strategy-implementation-for-managers>

4. https://www.investopedia.com/terms/c/competitive_advantage.asp
5. <https://pressbooks.lib.vt.edu/strategicmanagement/chapter/11-4-corporate-ethics-and-social-responsibility/>
6. https://www.researchgate.net/publication/340816273_SOCIAL_RESPONSIBILITY_AND_ETHICS_IN_STRATEGIC_MANAGEMENT

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions, Case Studies.

Course Designers

Dr. S. Sudha

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1CC4	ORGANIZATIONAL BEHAVIOUR	CORE	6	5

Course Objective

- To have an understanding about the structure and behavior of organization.
- To enable students to describe how people behave under different conditions and understand why people behave as they do.

Prerequisite

Basic knowledge in Business Management and Human Resource Management

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the concept of organizational behavior to understand the behavior of people in the organization and to explain different models used to explain individual behavior.	K1,K2
CO2	Apply the concept of personality and to analyse how individual personality and behaviour impacts the typical contemporary work experience.	K3,K4
CO3	Identify how individual, groups and structure have impact on the organizational effectiveness and to explain the concept of learning and attitude.	K4, K5
CO4	Point out how the organizational behavior can integrate in understanding the motivation and to explain the various leadership styles and the role of leaders in a decision making process.	K4, K5
CO5	Compare the relationship between group and team and to demonstrate how the organizational behaviour can integrate in understanding the motivation behind behaviour of people in the organisation.	K4, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	2	2	3	3	3
CO2	2	3	3	3	3	3	3	3	2	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Organizational Behaviour – Meaning – Definition – Fundamental Concepts – Approaches – Characteristics – Scope – Limitations – Challenges and Opportunities – Models of Organizational Behaviour.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Personality: Meaning – Definition – Features – Types of Personality – Determinants of Personality – Big Five Model – MBTI – Managerial Implications of Personality Perceptions: Meaning – Definition – Concept of Perception – Features – Importance of Perception – Factors affecting Perception – Process of Perception – Measures for improving Perception.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Learning: Meaning – Definition – Nature of Learning – Learning Process – Factors affecting Learning – Learning Theories – Classical and operant conditioning – Differences – Reinforcement – Positive and Negative Reinforcement Attitude: Meaning – Definition – Components of Attitude – Characteristics of Attitude – Types of Attitude – Theories of Attitude Formation – Functions of Attitude – Formation of Attitude – Attitude Change – Methods of	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	Attitude Change – Developing Positive Attitude by Individuals.			
IV	<p>Motivation: Meaning – Definition – Concept – Nature – Importance – Types – Motivation Process – Theories of Motivation</p> <p>Leadership: Meaning – Definition – Concept – Importance of Leadership – Qualities of good leader – Leadership Styles – Leadership Theories – Leadership Development.</p>	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	<p>Groups and Teams: Meaning – Definition – Features – Types of Groups – Group Development – Stages – Group vs. Teams – Types of Teams – Creating Effective Teams – Managing and Developing Effective Teams</p> <p>Conflict Management: Meaning – Definition – Concept of Conflict – Stages / Process of Conflict – Types of Conflict – Conflict Resolution – Negotiation – Bargaining Strategies – Negotiation Process.</p>	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	<p>Self Study for Enrichment (Not to be included for End Semester Examinations)</p> <p>Importance of Organizational Behaviour Capital Rationing – Distortion in Perception – Principles of Learning – Leadership effectiveness – Conflict Management Techniques.</p>		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Prasad L.M, (2019), Organisational Behavior, 1st Edition, Sultan Chand & Sons.
2. Stephen P. Robbins (2018), Organisational Behaviour, 18th Edition, Pearson.

Reference Books

1. Aswathappa. K, (2016), Organizational Behavior, 4th Edition, Himalaya Publishing House, New Delhi.
2. Khanka.S. S (2006), Organizational Behavior, 2nd Edition, S. Chand Publishing.
3. Robbins, Stephen P, (2008), Organizational Behavior, 14th Edition, Prentice Hall, New Delhi.

Web References

1. https://www.tutorialspoint.com/organizational_behavior/organizational_behavior_conflict_management.html
2. <https://www.sscasc.in/wp-content/uploads/downloads/BBM/Organizational-Behaviour>
3. http://www.tmv.edu.in/pdf/Distance_education

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment, Seminar

Course Designers

Dr. S. Shameem

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1DSE1A	BUSINESS ETHICS, CORPORATE SOCIAL RESPONSIBILITY AND GOVERNANCE	ELECTIVE	6	3

Course Objective

- To outline the role of business ethics that influences the decision making process and also promotes an understanding on the issues of ethics in the areas of functional management along with the benefits of corporate social responsibility.
- To exhibit a broad appreciation of the ethical values in corporate governance as well as IT Sector in the context of globalized economic and its social relations.

Prerequisite

Basic knowledge in Corporate Governance and Business Ethics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and outline the concepts of business ethics, corporate social responsibilities and governance.	K1, K2
CO2	Apply the ethical aspect of social responsibility and analyze its implications in various functional areas of business management.	K3, K4
CO3	Examine the legal provisions of the ethical policies of corporate social responsibility and governance.	K4
CO4	Evaluate the ethical practices in corporate social responsibility and governance.	K5
CO5	Discuss the issues and challenges in the field of business ethics, social responsibilities and governance in the current scenario.	K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Meaning – Definition – Nature – Need – Importance, Benefits and Approaches to Business Ethics – Determinant of Work Ethics – Internal and External Ethics of Business – Whistle blowing – Digital Business Ethics. Case Studies: Infosys Technologies – The best among Indian Corporations.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Marketing Ethics – Context of Indian Economy – Normative Marketing Ethics – Areas in Marketing Ethics. Ethical Issues in Human Resources – Scope – Different aspects – Emerging challenges of HRM – Role of HRM in creating an Ethical Organization Financial Management: An overview. Ethical Perspective of IT Industry – Fast changing face of Cyber Crimes – Protection from Cyber Criminals. Case Studies: Credit Card Data Fraud, Cyber Crimes – the Glitches Amidst the glow.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Meaning – Definition – Significance – Principles of Corporate Governance, Issues – Strategies and Techniques to Sound Corporate Governance – Corporate Governance in India – Indian Model – Obligation: Investors, Employees, Customers, Managerial – Legislative Changes. Case Studies: Tata Steel – A	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	Company which produces the best Steel in Indian Corporations.			
IV	Meaning – Corporate Philanthropy – CSR an Overlapping Concept – Corporate sustainability Reporting – CSR through Triple Bottom Line – CSR and Business Ethics – CSR and Corporate Governance – Environmental aspect of CSR – CSR Models – Drivers of CSR – Global Reporting Initiatives – Major Codes on CSR – Initiatives in India – Case Studies : Dr. Reddy’s Laboratories – Commitment to All Round Corporate Excellence.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Growth of global corporations – Factors facilitating Globalization – Role of MNC’s – Benefits of MNC’s to Host Nation – Challenges of Globalization in the context of Growing Market – Key Global Issues for Business – Case Studies: Sterlite – using Money Clout to Maximum Advantages.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Professional Ethics, Conflicts of interest, Ethical Challenges - Global Market, Banking Ombudsman Scheme, Contemporary Technology - Corporate democracy, Corporate mis-governance, Governance Mechanisms - Perspectives CSR, New economy initiatives – CRT principles in Globalization.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Fernando, A.C, (2012), Business Ethics – An Indian Perspective, 3rd Edition, Pearson Education in south Asia Pvt. Ltd.
2. Saha.,P.K, (2009), Business Ethics, 3rd Edition Pacific Publication, New Delhi.
3. Khanka.S.S, (2014), Business Ethics and Corporate Social Responsibility, 6th Edition Sultan Chand & Company.

Reference Books

1. Parveen Parboteeah K, & John B.Cullen, (2012), Business Ethics, 5th Edition, Routledge,
2. John R. Boatright., & Bibhu Prasan Patra, (2011), Ethics and Conduct of Business, 6th Edition, Pearson.
3. Ferrell, O.C., Fraedrich, John, & Ferrell, Linda, (2018), Business Ethics, Ethical Decision Making & Cases, 10th Edition, Cengage learning.

Web References

1. <http://www.businessethics.ca/>
2. <https://www.investopedia.com/terms/b/business-ethics.asp>
3. <https://business-ethics.com/>
4. <https://www.csr.gov.in/content/csr/global/master/home/home.html>
5. <https://www.investopedia.com/terms/c/corporategovernance.asp>

Pedagogy

PPT, Discussion, Assignment, Quiz, Seminar

Course Designers

Dr. D. Ramya

Semester I	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1DSE1B	SERVICES MARKETING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To enable the students to know the Principles, Practices, Development and Challenges in Services Marketing.

Prerequisite

Basic knowledge in Services Marketing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify the Concepts of Services Marketing	K3
CO2	Develop and justify marketing planning and control systems appropriate to service based activities	K3
CO3	Examine the Marketing Mix Strategies to be adopted in Service Marketing	K4
CO4	Evaluate the Services Marketing Development Process in various Sectors	K5
CO5	Discuss the Strategic approach of Services Marketing in Global Scenario	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	2	2	2	2
CO2	3	3	2	3	2	2	2	2	2	2
CO3	3	3	2	3	3	2	2	2	2	2
CO4	3	3	2	3	2	3	2	2	2	2
CO5	3	2	2	3	3	3	2	2	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Service – Meaning – Characteristics – Classification of Services – Growth of Service Sector and Service Industries – Difference between Goods and Services – Service Marketing – Evolution – Need – Growth in Services Marketing – Challenges and Issues in Services Marketing.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Introduction – Service Environment – Service Blueprinting – Demand – Supply Management – Management of Service Capacity and Relationship – Relationship Marketing – Service Recovery – Customer – Service Expectation – Service Encounter – Service Quality – Service Quality Gap – Service Quality Audit – SERVQUAL – Development of New Service Product – Branding – Leadership – Strategy – Service Triangle.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	. Introduction – Marketing Mix – Concept – Product Mix – Levels of Product – Line – Development – Process – Package – Price Mix – Place Mix – Promotional Mix – Advertising – Publicity – Sales Promotion – Personal Selling – Telemarketing Process – Physical Evidence and Attractiveness and People.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Meaning – Overview of Different Service Sectors – Banking – Insurance – Education – Tourism – Airlines –	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	Hospitality – Healthcare – Online Services – Professional Services – Social Service by NGOs – BPO & IT Sectors.			
V	Introduction – Strategic Approach – E-Commerce – E- Marketing – Tele marketing – Research for Global Markets and Rural Markets – Innovations – Ethical Aspects in Service Marketing.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Characteristics of services and their marketing implications – CRM – Identifying and satisfying customer needs – Relationship Marketing – Customer Satisfaction – Managing service brands.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Jha S.M, (2011), Services Marketing, 7th Edition, Himalaya Publication.
2. Ravi Shankar, (2006), Services Marketing, 6th Edition, Excel Books.
3. Vasanthi Venugopal Raghu V.N, (2006), Services Marketing, 1st Edition, Himalaya Publication.
4. Dr. L. Natarajan, (2013), Services Marketing, 3rd Edition, Margham Publication.

Reference Books

1. Sherlekar, S.A and Krishnamoorthy R, (2010), Marketing Management, 6th Edition, Himalaya Publishing House.
2. Dhruv Grewal, (2018), Marketing, Tata McGraw Hill, 10th Edition, India.
3. Kotler Philip, (2015), Marketing Management, 15th Edition, Sultan Chand & Sons.

Web References

1. <https://www.managementstudyguide.com/changing-face-of-services-marketing.htm>
2. <https://www.yourarticlelibrary.com/services/7-elements-used-in-marketing-mix-for-services/34003>

3. <https://www.accountingnotes.net/marketing/service-marketing/service-marketing/17625>
4. <https://www.educba.com/service-marketing-strategies/>
5. <https://www.marketingtutor.net/service-marketing/>

Pedagogy

Power Point Presentation, Assignment, Quiz, Seminar & Group Discussions

Course Designer

Dr. S. Sudha

Semester I	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO1DSE1C	INTERNATIONAL HUMAN RESOURCE MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- The course is intended to provide a basic understanding about the finer aspects of international business to the students.
- It is aimed at making the students realize that International Business is a combination of multiple disciplines brought together in a systematic manner.

Prerequisite

Basic Knowledge in Human Resource Management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Apply the principles of International Human resource management and its models	K3
CO2	Analyze the Strategies for International Growth	K4
CO3	Determine the functions of International recruitment, selection and staffing	K5
CO4	Appraise the various methods of global training and development.	K5
CO5	Construct the International Compensation and International Employment Laws	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	2	3	3	3	3
CO2	3	3	2	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction - IHRM – Concept, Scope, Nature of IHRM - Approaches to IHRM - Difference between domestic HRM and IHRM - Models of IHRM - Matching model, Harvard Model, Contextual Model, 5P Model European Model.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Strategies for International Growth: Exploiting global integration- the logic of global integration, differentiation, Mastering expatriation, the traditional expatriate model, advantages and disadvantages of global integration. Managing alliances and joint ventures - IHRM and International Alliances, IHRM and International Joint Ventures.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	International Workforce planning and staffing: International labour market International Recruitment function; head-hunters, cross-national advertising, e-recruitment; International staffing choice, different approaches to multinational staffing decisions, types of international assignments, Selection criteria and techniques, use of selection tests, interviews for international selection, international staffing issues, successful expatriation, role of an expatriate, female expatriation, repatriation, re-entry and career issues – Case Study.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Developing Global Mindset: Global Leadership, Cross cultural context and international assignees, Current scenario in international training and development, training & development of international staff, types of expatriate training,	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	sensitivity training, Career Development, repatriate training, developing international staff and multinational teams, knowledge transfer in multinational companies – Case Study.			
V	International Compensation and International Employment Laws: International compensation and international assignees, Forms of compensation, key components of international compensation, Approaches to international compensation, compensation practices across the countries, emerging issues in compensation management. Establishment of labour standards by International Institutions, The global legal and regulatory context of MNE, The International framework of Ethics and Labour standards, Key issues in International Industrial Relations, Trade Unions and MNE's, Response of Trade Unions to MNE's, Non-Union worker representation – Case Study.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Organizational dynamics in IHRM - Limits of global integration - Digitalized Selection Process - Issues and challenges in international performance management - Emerging impact in compensation management.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Aswathappa K (2017), Human Resource and Personnel Management, 8th Edition, Tata McGraw Hill.
2. Charles W L Hill (2017), International Business, 13th Editions, Tata McGraw Hill.
3. Cynthia D Fisher, Lyle F Schoenfeldt, James B Shaw (2006), Human Resource Management, 6th Editions, Houghton Mifflin Co.

Reference Books

1. Ian Beardwell & Len Holden (2003), Human Resource and Personnel Management, 4th Edition, FT Prantice Hall.
2. Peter J Dowling, Marison Festing (2013), International Human Resource Management, 6th Edition, Cengage Learning.

Web References

1. <https://mlritm.ac.in/assets/img/INTERNATIONAL%20HUMAN%20RESOURCE%20MANAGEMENT.pdf>
2. <https://www.ftms.edu.my/images/Document/MOD001055%20%20International%20Business/CHAPTER%208.pdf>
3. https://faculty.ksu.edu.sa/sites/default/files/international_human_resource_management_6th_edition.pdf
4. <https://nscpolteksby.ac.id/ebook/files/Ebook/Business%20Administration/ARMSTRONGS%20HANDBOOK%20OF%20HUMAN%20RESOURCE%20MANAGEMENT%20PRACTICE/8%20-%20International%20HRM.pdf>

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Dr.S.Jayalakshmi

Semester II	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2CC5	COST AND MANAGEMENT ACCOUNTING	CORE	6	5

Course Objective

- To acquire knowledge and understanding of the concepts, techniques and practices of Cost and Management accounting and to develop skills for decision making.

Prerequisite

Basic knowledge in Cost Accounting and Management Accounting.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Relate, develop and apply the techniques of Management Accounting in the financial decision making	K1,K3,K5
CO2	Recall, classify and adapt cost accounting approaches to solve practical problems	K1, K2, K6
CO3	Apply and assess different types of activity based management tools through the preparation of estimates	K3, K5
CO4	Make use of management reports for planning and monitoring purpose and recommend the level at which costs need to be captured.	K3, K5
CO5	Analyze to improve the operations of organization through the application of cost and Management accounting methods	K4, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	3
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	3	2	3	3	3	3	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Cost accounting - Introduction, Meaning, Definition, Nature, Scope and Objectives of Cost Accounting, Methods and Techniques of Costing - Cost Centers and Cost unit.- Management Accounting: Evolution, Meaning, Objectives and Scope - Tools and Techniques of Management Accounting - Relationship of Cost Accounting, Financial Accounting and Management Accounting.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Activity Based Costing – Meaning, Importance, Characteristics- Elements and steps-ABC vs Traditional costing – Uses and Limitations- Cost Ledgers- Integrated and Non-Integrated Accounts - Reconciliation of Cost and Financial Accounts – Service Costing – Features and applications – Unit Costing and Multiple Costing – Application.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Standard costing -Definition, Significance and Applications - Various Types of Standards - Installation of Standard Costing System-for Material, Labour, and Overhead - Variance Analysis for Materials, Labour and Overheads and Accounting Treatment of Variances - Benchmarking for Setting of Standards - Variance Reporting to Management.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Marginal Costing - Meaning, Advantages, Limitations and Applications - Breakeven Analysis - Cost-Volume Profit Analysis - P/V Ratio and its Significance - Margin of Safety - Absorption Costing: System of Profit	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	Reporting and Stock Valuation - Difference between Marginal Costing and Absorption Costing - Income Measurement under Marginal Costing and Absorption Costing			
V	Financial Statements: Nature, Attributes, Objectives, Importance, Limitations - Recent Trends in Presenting Financial Statements- Cash Flow Statement - Fund Flow Statement - Difference between Cash Flow and Fund Flow Statement - Management Reporting.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Nature and Scope of Cost Audit - Cost Accounting Records and Cost Audit under Companies Act, 2013 - Purpose, Scope and Advantages of Cost Audit.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Distribution of Marks: Theory 40% and Problem 60%

Text Book.

1. S.P. Jain & K.L. Narang,(2019), Cost and Management Accounting,16th edition, Kalyani Publishers.
2. T.S. Reddy &Y. Hari Prasad Reddy,(2014), Cost and Management Accounting, 4th edition Margham Publications.
3. Prof. Dr. Ghosh.A.P,(2017), A Practical approach to Cost and Management Accounting, 1stedition, Scitech Publications(India) Pvt.Ltd.

Reference Books

1. M.Y. Khan & P.K. Jain, (2017),Management Accounting Text, Problems and Cases,7th edition, McGraw-Hill Education (India) Ltd.
2. M.N. Arora, (2021), A Text Book of Cost and Management Accounting,11th edition,S.Chand and company Ltd.
3. N.S. Zad, (2015), Cost & Management Accounting,Taxmann Publications Pvt. Ltd..
4. V.K. Saxena& C.D. Vashist,(2011), Advanced Cost and Management Accounting,19th edition,Sultan Chand & Sons.

Web References

1. <https://www.tarakeswardegreecollege.org/res/class/Activity%20Based%20Costing.pdf>
2. <https://www.accountingtools.com/articles/standard-cost-variance>
3. https://static.careers360.mobi/media/uploads/froala_editor/files/Cost-Accounting-System.pdf

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designers

Prof. Dr. N. Savithri

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCO2CC6	BUSINESS ANALYTICS	CORE	6	5

Course Objective

- To teach statistical techniques which aid modern managers intake wise decisions in a competitive environment
- To understand the role of business analytics within an organization
- To Translate the results of business analytic projects into effective courses of action

Prerequisite

- Basic Statistical Knowledge

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the advanced analytical tools to analyse complex problems under uncertainty	K2
CO2	Compare business processes using analytical and management tools	K3
CO3	Apply appropriate analytical methods to find solutions to business problems using SAS, Excel and SPSS	K3
CO4	Identify and describe complex business problems in terms of analytical models	K3, K4
CO5	Extract and manipulate data sets from various sources to meet organizational needs	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction to Business Analytics and Data Analysis Tools:</p> <p>Business Analytics, the Science of Data-Driven Decision Making - Analytics Techniques Used in the Industry - Some Practical Applications of Business Analytics - Big Data vs. Conventional Business Analytics - The Background Required for a Successful Career in Business Analytics.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>SAS Introduction:</p> <p>Starting SAS in Windows - The SAS Opening Screen - The Five Main Windows - Important Menu Options and Icons - Writing and Executing a SAS Program - Your First SAS Program - Debugging SAS Code Using a Log File - Tips for Writing, Reading the Log File, and Debugging - Saving SAS Files</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>Getting Started with Excel:</p> <p>Workbook and Worksheets – Navigation with Keyboard – Tabs and Ribbons – File Menu – Quick Access Toolbar (QAT) – Excel options – Create a New Workbook, Print and Save – Understanding Worksheet Basics.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>SPSS Data File:</p> <p>Opening a data file in SPSS- SPSS data editor- Statistical Analysis- Editing and Manipulating data- Missing Values – Editing SPSS output – Copying SPSS output – Changing from Portrait to Landscape – Printing from SPSS - Closing SPSS – Tutorials in SPSS – Importing data.</p> <p>Descriptive Statistics with SPSS:</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Descriptive Statistics – Measures of Central Tendency - Measures of Dispersion - Descriptive Statistics with SPSS.			
V	<p>Charts and Graphs: Bar Charts – Pie Chart – Scatter plots and Dot Plots – Line Graphs – Histogram.</p> <p>Comparing Averages: Parametric tests and Non-Parametric tests to compare averages – Student’s t-test - Other tests for comparing averages.</p> <p>Analysis of Variance (ANOVA): Analysis of Variance – One factor between subjects</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>Self-Study for Enrichment (Not included for End Semester Examinations)</p> <p>SAS Data Sets - SAS Libraries - Protecting Excel Workbook and Worksheet – Importing data into Excel – Exporting Data from Excel — Multiple Analysis of Variance (MANOVA)</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Venkat Reddy Konasani and Shailendra Kadre (2015), Practical Business Analytics Using SAS A Hands-on Guide, Apress.
2. Manisha Nigam (2020), Advanced Analytics with Excel 2019, BPB Publications, First Edition.
3. Rajathi A and Chandran P (2010), *SPSS for you*, MJP Publishers.

Reference Books

1. David Whigham (2007), *Business Data Analysis using Excel*, Oxford University Press.
2. Wayne L. Winston (2016), *Microsoft Excel 2016 Data Analysis and Business Modeling*, PHI Learning Private Limited.

3. Kieth McCormick and Jesus Salcedo with Aaron Poh (Reprint 2015), *SPSS Statistics for Dummies*, Wiley India Private Limited, Third Edition.

Web References

1. <https://spu.fem.uniag.sk/cvicenia/ksov/obtulovic/Data%20Analysis%20Using%20SAS%20Enterprise%20Guide.pdf>
2. https://www.w3schools.com/excel/excel_introduction.php#:~:text=It%20is%20a%20spreadsheet%20program,several%20changes%20over%20the%20years.
3. <https://www.managementstudyguide.com/business-analytics.htm>
4. <https://www.youtube.com/watch?v=ZpwZS3XnEZA>
5. <https://www.youtube.com/watch?v=6rgwgwv8qdA>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Ms. R. Soundaria.

Semester II	Internal Marks: 25	External Marks: 75		
COURSECODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2CC7	DIGITAL MARKETING	CORE	6	5

Course Objective

- To make the students understand the bases of Digital Marketing

Prerequisite

Basic knowledge about the Digital Marketing

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define, classify and apply the concept of digital marketing and search engine optimization works in the digital era.	K1,K2,K3
CO2	Explain emerging trends in digital marketing and critically assess the use of digital marketing tools.	K2, K5
CO3	Outline and appraise the main elements of the digital marketing strategies and the components of the digital marketing plan.	K2, K5
CO4	Analyse and build a solid understanding of core business principles in the primary areas of digital marketing, web technology and new media management.	K4, K6
CO5	Interpret and apply the traditional marketing mix within the context of a changing and extended range of digital strategies and tactics.	K3, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	2
CO2	3	3	3	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	2
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Digital Marketing Fundamentals – Meaning of Digital Marketing – Marketing Vs Sales – Marketing Mix and 7 P’ s – Content Marketing – Strategic flow for Marketing activities – Setting Digital Marketing Objectives.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	New Non – Linear Marketing Approach – Use in the Digital Era – Brand Awareness – Latest Developments and Strategies – Ineffective form of Digital Marketing – Digital Marketing Tools – Web Content and Design – Web Consists – Skills of Content Writer – E Marketing – Types – Importance – Online Marketer.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Search Management – Meaning – Method sand Metrics – Paid Inclusion – Comparison with Search Engine Optimization – Meaning of Search Engine Optimization – Search Engine Reputation Management – Search Engine optimization in Marketing – Importance – Search Engine Optimization works – Types of Search Engine Optimization.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Design Digital Marketing Plan – SWOT – Situational Analysis – Key Performance – Indicators in Internet Marketing – Digital Landscape – POEM Framework – Segmenting and Customizing Messages – Digital Advertising Market in India.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Web Analytics – Meaning – Metrics – Types – Omniture Web Analytics – Purpose – Best Tools of Web Analytics – Social Media – You Tube – Whatsapp –Twitter – Face book – Difference	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	between Social Media and Social Networking – Digital Marketing Tool Kits – Digital Marketing cases from India.			
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Email Marketing – customer relationship marketing internet communities		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Damian Ryan, (2016), Understanding Digital Marketing, 4th Edition, Kogan Publishers.
2. Philip Kotler (2017), Marketing 4.0 Moving from Tradition to Digital Marketing, 1st Edition, Willey.
3. Ian Dodson, (2016), The Art of Digital Marketing, 2nd Edition, Kindle.

Reference Books

1. Rejendra Nargudkar and Romji Sainy, (2018), Digital Marketing cases from India Inc, 1st Edition, Notion Press.
2. Simon Kingnorth, (2019), Digital Marketing Strategy, 2nd Edition, Kogan Publishers.
3. Puneet Singh Bhatia, (2020), Fundamentals of Digital Marketing, 2nd Edition, Pearson India Education Services Pvt. Ltd.,

Web References

1. <https://www.investopedia.com/terms/d/digital-marketing.asp>
2. https://www.tutorialspoint.com/pinterest_marketing/digital_marketing_introduction.htm
3. <https://www.britishcouncil.org.ng/programmes/education/skills-enterprise-projects/digital-skills-training-enterprise/introduction>

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment and Seminar

Course Designer

Dr. S. Sudha

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2CCC1A	SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT	CORE CHOICE	6	4

Course Objective

- To provide insight on security analysis as a technique for optimal investment and portfolio management.

Prerequisite

Basic knowledge about Investment and Securities

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define and classify the various investment alternatives and risk elements in the construction of portfolio.	K1, K2
CO2	Outline and Apply the techniques of security analysis for selecting the best investment proposal.	K2, K3,
CO3	Identify and examine various principles for better portfolio management.	K3, K4
CO4	Compare and explain various concepts, theories and models of security analysis and portfolio management	K4, K5
CO5	Evaluate and create an efficient portfolio for optimum return	K5, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	2	2
CO2	3	3	3	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	2
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Investment- Characteristics – Objectives – Investment Vs. Speculation Vs. Gambling – Investment Process – Investment Planning – Investment Alternatives - Securities Market. Risk and Return – Systematic and Unsystematic Risk – Minimizing Risk.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Fundamental Analysis: Economic Analysis – Economic Forecasting. Industry Analysis: Industry Life Cycle – Analytical tools. Company Analysis – Qualitative and Quantitative Factors – Analysis of Financial Statement.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Technical Analysis – Dow Theory – Gaps – Charts – Candlestick Chart – Elliot Wave Theory – Technical Vs. Fundamental Analysis.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Portfolio Construction – Markowitz Model – Sharpe Index Model – Capital Asset Pricing Model – Arbitrage Pricing theory – Efficient Market Hypothesis.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Portfolio Evaluation - Mutual Fund: Concept, Objectives, Feature and Types. Portfolio Revision – International Portfolio Investment - Management of Portfolio: Passive and Active Management.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Securities and Exchange Board of India – Over the Counter Exchange of India- National Stock Exchange – Unit Trust of		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	India - Stock Derivatives – Investment information - Life Cycle Finance.			
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Text Book

1. Punithavathy Pandian (2013), Security Analysis and Portfolio Management, 2nd Edition, Vikas Publishing House Pvt. Ltd.
2. Prasanna Chandra (2021), 6th Edition, Investment Analysis and Portfolio Management, MC Graw Hill.

Reference Books

1. V.K.Bhalla (2014), Investment Management, 13th Edition, S.Chand.
2. Donald E.Fisher and Ronald J.Jordan (2018), Security Analysis and Portfolio Management, 6th Edition, Pearson Education Pvt. Ltd.
3. S.Kevin, (2014), Security Analysis and Portfolio Management, 12th Edition, PHI Learning Private Limited,

Web References

1. <https://www.managementstudyguide.com/security-analysis-and-portfolio-management.htm>
2. https://onlinecourses.nptel.ac.in/noc22_mg113/preview
3. <https://www.worldscientific.com/worldscibooks/10.1142/8116>
4. <https://www.shobhituniversity.ac.in/pdf/econtent/Security-Analysis-and-Portfolio-Management-Unit-1-Dr-Asma-Khan.pdf>
5. https://mec.edu.in/mvlc/ppt/1_mba/ppt_sapm.pdf

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment and Seminar

Course Designers

Dr. C.Subha

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2CCC1B	INSURANCE AND RISK MANAGEMENT	CORE CHOICE	6	4

Course Objective

- To provide an insight to the students into some areas of Insurance Management with special emphasis on Life Insurance, Health Insurance and some parts of Non-Life Insurance.

Prerequisite

Basic knowledge in Insurance Management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the various insurance needs of the society and industry in the current market scenario.	K1,K2
CO2	Understand the management aspects of Insurance in the areas of Life Insurance, Health Insurance, Fire, and other non-life insurance.	K3,K4
CO3	Analyze the marketing of insurance services and channels of distribution	K4, K5
CO4	Discuss the importance of risk management and methods of mitigating risks in insurance.	K4, K5
CO5	Explain the underwriting principles and insurance company risk control operations.	K4, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	2	3	3	3	3	3	3	2
CO4	3	3	2	3	3	3	3	3	2	3
CO5	3	3	2	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Insurance: Role of Insurance –Principles of Insurance – Functions of Insurance – Benefits of Insurance to Society – Reinsurance – Double Insurance – IT in Insurance.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Indian Insurance Industry – Reforms – Private Players to Indian Insurance Market – IRDA Regulations: For Licensing of Insurance Agents –Protection of Policy Holders.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Insurance Contract: Life Insurance Contract–Features, Policy conditions and Products; Non – Life Insurance: Fire and Marine - Features, Policy Conditions and Products. Group, Health and Social Insurance – Schemes- Procedure for claiming Life and Health Insurance.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Introduction to Risk Management – Importance of Risk Management - Risk and Uncertainty – Classification of Risk – Objectives of Risk Management – Risk Management Process.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Risk Management and Control– Methods of Risk Management – Risk Management by Individuals and corporations – Tools for controlling risk.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Insurance Laws and Regulations – Policies		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

	for handicapped lives – Pension plans - Risk Financing – Risk Management Environment – Insurance Intermediaries.			
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Text Book

1. Dr. P.K. Gupta,(2022),“Insurance and Risk Management”, 2nd Edition, Himalaya Publishing House, Mumbai.
2. Dr.P.Periasamy (2017),” Principles and Practice of Insurance”, 1st Edition, Himalaya Publishing House, Mumbai.

Reference Books

- 1.Dr. A. Murthy,(2019)“Elements of Insurance”, 2nd Edition, Margham Publications, Chennai,
2. Dr.Sunil Kumar(2017),” Insurance and Risk Management”, Second Edition, Galgotia Publishing Company, New Delhi.
3. ICAI (2020), New Delhi – Study Material – Risk Management and Reinsurance.

Web References

1. https://ebooks.lpude.in/commerce/bcom/term_6/DCOM309_INSURANCE_LAWS_AND_PRACTICES.pdf
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SBAA1505.pdf
3. <https://www.himpub.com/documents/Chapter1906.pdf>
4. <https://www.studocu.com/in/document/jamia-millia-islamia/fundamentals-of-insurance/insurance-and-risk-management-study-materials/19535883>.

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment, Seminar

Course Designer

Dr. J.Praba.

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2CCC1C	BRAND MANAGEMENT	CORE CHOICE	6	4

Course Objective

- To help the students to understand the Brand Image, Identity and Positioning of Brand Management.

Prerequisite

Basic knowledge in Brand Management.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify and Explain the Brand Management, Brand Identity, Brand Image, Brand Personality, Brand Equity and Brand Positioning.	K1, K2, K4
CO2	Analyze the concepts of Brand Management and to discuss the Customer's Perception of Brand Identity.	K2, K4
CO3	Discuss and summarize the Equity, Ethical Brand Positioning of Management.	K2, K3, K6
CO4	Relate and compare with the Case Studies of Brand Management.	K1, K4
CO5	Predict the concepts of Brand Management and new tool for Distinctive Positioning.	K1, K2, K3, K5, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	3	2	2	3	3	3	2	3	2
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	3	2	3	3	3	3
CO5	3	3	3	3	3	2	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	An Introduction to Brand Management – Meaning and Definitions – Essentials for success of Brands – Brand Evolution – Brand Perspectives – Development of Branding – Anatomy of Brand – Brand Name – Types – Individual and Family Branding – Merits and demerits.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5, K6
II	Elements of Brand Management – Introduction – Brand Positioning – Equity – Awareness – Identity – Personality – Communication – Image – Brand Identity – Definition – Models – Elements of Brand Identity – Brand Identity levels – Inner core or outer core of a brand.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5, K6
III	Brand Image – Introduction – Definition – Kapferer’s Model – Brand Gap – Roles of Metaphors in Delivering Brand Image – Decoding Brand Image – Brand Concept – Stages – Forces affecting brands – Brand Personality – Definition – Scales of Brand Personality – Why use Brand Personality.	18	CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Brand Equity – Introduction – Definition – Measuring of Brand Equity – Building Brand Equity – Brand Extension – Introduction – Why Brand Extensions – Merits and Demerits – Choosing the Right Brand Extensions – Category related – Image related – Unrelated Brand Extension.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Brand Positioning – Introduction – Definition – Positioning errors – Brand Checks – Brand	18	CO1, CO2, CO3,CO4,	K1, K2, K3, K4, K5, K6

	Awareness – Brand Recall – Ethical Brand Positioning – Conceptual Framework – Ethical and Global Brands in Cross-Cultural Environment.		CO5	
VI	Self - Study for Enrichment (Not included for External Examination) Developing New Ideas into Products and Brands: Case Studies, Strategic Framework for Brand Identity, Case Studies of Brand Image, Brand Personality and Brand Equity, Strategies for Cross Cultural Adaptation of Ethical Brand Positioning.		CO1, CO2, CO3,CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Dr. MahimSagar, Dr. Deepali Singh, Prof. D.P. Agarwal, Achintya Gupta, (2012), Brand Management, 1stEdition, Ane Books Pvt. Ltd, New Delhi.
2. Dr. L. Natarajan, (2011), Brand Management, 1st Edition, Margham Publications, Chennai.
3. Naveen Das, (2002), Brand Management Perspectives and Practices, 1st Edition, ICFAI University Press, Hyderabad.

Reference Books

1. Dr. RamKishen Y., Nalini Dutta (2018), Strategic Brand Management, 1st Edition, Ane Books Pvt. Ltd, New Delhi.
2. Mathur U.C. (2010), Brand Management, 1st Edition, Macmillan Publishers India Ltd. New Delhi.
3. Suresh. K. (2005) Brand Portfolio Management, 1st Edition, ICFAI University Press, Hyderabad.

Web References

1. <https://marcom.com/what-does-brand-management-mean/>
2. <https://sendpulse.com/support/glossary/brand-management>
3. <https://www.slideteam.net/brand-management-powerpoint-presentation-slides.html>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Capt. Dr. P. Kavitha

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2DSE2A	LOGISTICS AND SUPPLY CHAIN MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To know how a logistic strategy fits into an organization's broader decisions, understand the role of logistic providers, and realize the meaning of customer service and understand its importance to logistics management.

Prerequisite

Basic knowledge in Supply Chain Management

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and develop an understanding of basic concepts and role of Logistics and supply chain management in business.	K1,K3, K5
CO2	Understand, and appraise how supply chain drivers play an important role in redefining value chain excellence of Firms	K1, K2, K5
CO3	Apply and assess the tools and techniques useful in implementing supply chain management	K3, K5
CO4	Identify, analyze and integrate various supply chain strategies.	K3, K4
CO5	Make use of logistics and supply chain strategies to create value generation and utilize IT applications	K3, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	2	3	3
CO2	3	3	2	3	3	3	3	2	3	3
CO3	3	3	2	3	2	3	3	2	3	3
CO4	3	3	2	3	2	3	3	2	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Logistics Management – Definition – Scope – Functions – Objectives of Integrated Logistics Management – Role of Logistics in Supply Chain – Logistics and Customer Service – Role of Logistics in Competitive Strategy – Logistics Organization and Performance Measurement –Reverse Logistics – Scope, Design.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	.Supply Chain – Objectives – Importance – Decision Phases – Process View – Competitive and Supply Chain Strategies – Achieving Fit – Supply Chain Drivers – Obstacles – Framework – Facilities – Inventory- Transportation – Information – Sourcing – Modeling for Supply Chain – Supply Chain Relationships – Channel Relationships - Dimensions – Approaches to study channels.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Designing the Distribution Network – Role of Distribution and Network – Factors Influencing Distribution – Design Options – E- Business and its impact – Distribution Network in Practice – Factors affecting Networking Design Decision Modeling.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	E-logistics – Logistics Information System – Supply Chain information System Modules - Application of IT in Logistics – Automatic Identification Technologies – Bar Coding, WMS,TMS,LMS,OMS, WCS,and RFID. Containerisation – Concept –Types, Benefits		CO1, CO2, CO3,CO4,	K1,K2,K3, K4,K5,K6

	– Types of Carriers – Indirect and Special Carriers – Role of Intermediaries – Shipping Agents, Brokers – Freight management – Route Planning of Transports,ICDs, CONCOR – Global Shipping Options.	18	CO5	
V	Ware house Management – Storage Functionality and Principles – Warehouse benefits Types -Role of Transportation – Modes and their Performance – Transportation Infrastructure and Policies – Design Options and their Trade Offs – Tailor Transportation, Sourcing-in-House or Outsourcing-3 rd and 4 th PLS, GPS and GLS Technology, Supply Scoring and Assessment, Lean Management, Lean Manufacturing, Mass Customization	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
VI	Self Study for Enrichment (Not to be included for End Semester Examinations) Case Study - The taste of information and communication technology in supply chain- Amul, Reaching the masses on call – Pantaloons.		CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

Text Book

1. Sunil Chopra and Peter Meindl, Dr,D.V Kalra (2016),Supply Chain Management – Strategy, 6th edition, Planning Operation, Prentice Hall, India ,
2. Dr.L.Natarajan, (2017), Logistics and Supply Chain Management , 1st edition, Margham Publications.
3. Sunil Sharma, (2010), Supply Chain Management Concepts, Practices, and Implementation, 1st edition, Oxford University Press.

Reference Books

1. Ailawadi C. Sathish and Rakesh Singh, (2013), Logistics Management, 2nd Edition, Prentice Hall, India.
2. Agarwal D K, (2003), Text Book of Logistics and Supply Chain Management, 2nd Edition, Macmillan India Ltd / Lakshmi Publications.
3. Donald J. Bowersox. David J. Closs. M. Bixby Cooper, (2017), Supply Chain Logistics Management, 2nd Edition, McGraw Hill Education (India).

Web References

1. <https://www.googlesir.com/information-technologies-used-in-supply-chain>
2. <https://www.accountingtools.com/articles/standard-cost-variance>
3. <https://backup.pondiuni.edu.in/sites/default/files/Logistics%20Supply%20Chain%20Mgt200813.pdf>
4. https://www.tutorialspoint.com/supply_chain_management/supply_chain_management_tutorial.pdf

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Group Discussions

Course Designer

Prof. Dr. N. Savithri

Semester II	Internal Marks: 25	External Marks: 75		
COURSECODE	COURSETITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2DSE2B	RETAIL MANAGEMENT	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To provide the learner with an overview of the Retail Management Concepts and Processes and an Opportunity to understand the areas of Accountability for a Retail Manager

Prerequisite

Basic knowledge about Digital Marketing

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define and interpret the Growth and Development of Retail Sector	K1, K2
CO2	Outline and Apply Retail set up Operation Management and Retail Format with Diverse Mix	K2,K3
CO3	Identify and examine the Effectiveness of Retail Shop Management	K3, K4
CO4	Evaluate and create the Technology Upgrade in Retail Environment	K5, K6
CO5	Examine and evaluate the procurement of retail merchandising	K4, K6

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	2
CO2	3	3	3	3	3	3	3	2	2	2
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	2	2
CO5	3	3	3	3	3	3	3	3	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Meaning – Definition – Characteristics - Retailing principles - Retail sales objectives – Retailing in India – Across the globe – Emerging trends in retailing – Retail formats – Store based – Non store based – Traditional and Non-traditional retailing – Internet retailing – Cyber retailing.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
II	Importance – Selection of location – Site analysis – Trading analysis – Demand and Supply density – Site availability – Trends in store location – Retail marketing segmentation – Significance – Market segmentation process – Key retail segments.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
III	Basics of retail merchandising – The process of retail merchandising – The method of merchandise – Procurement – Retail pricing and evaluating merchandise performance – Retail communication mix.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
IV	Elements of Retail Store Operation – Management of retail store – The role of centralized retailer – An integrated retailing approach – Operations master schedule – Store maintenance – Energy management – Retailing success tips.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6
V	Distribution Channel – Functions of a distribution channel – Channel levels – Elements of physical distribution – Wholesaling – classification and characteristics – Warehousing – Need - Benefits – Function – Features – Classification.	18	CO1, CO2, CO3,CO4, CO5	K1,K2,K3, K4,K5,K6

VI	<p>Self Study for Enrichment (Not to be included for End Semester Examinations)</p> <p>Shopping process – Influences of shoppers attitude, perception, personality and lifestyle in retail shopping behavior -Handling complaints- CRM in retailing – Retail process.</p>		<p>CO1, CO2, CO3,CO4, CO5</p>	<p>K1,K2,K3, K4,K5,K6</p>
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Text Book

1. Dr. HarjitSingh, (2004), Retail Management 2nd edition S. Chand & Company Ltd, New Delhi.
2. Gibson G Vedamani, (2011) Retail Management,3rd edition Functional principles and Practices , Jaico Publishing Houses, New Delhi.
3. Gourav Ghosal, (2011), Retail management, 3rd edition Maxford Books, Publishing Houses, New Delhi.

Reference Books

1. Seema Gupta (2014) retail Management, 2nd edition, Biztantra publishers, New Delhi.
2. James R. Ogden and Denise J.Odgen (2010), Integrated Retail Mangement, 4th edition Biztantra publishers, New Delhi.
3. Dr. L.Natarajan (2016), Retail Management, 4th edition , Margham Publications, Chennai.

Web References

1. <https://www.monster.com/career-advice/article/effective-retail-management>
2. <https://safetyculture.com/topics/retail-management/>
3. <https://www.myaccountingcourse.com/accounting-dictionary/retail-management>
4. <https://www.careerindia.com/courses/unique-courses/what-is-retail-management-scope-career-opportunities-012122.html>
5. <https://www.monster.com/career-advice/article/effective-retail-management>

Pedagogy

Chalk and talk, Power Point Presentation, Discussion, Assignment and Seminar

Course Designer

Dr.S.Sudha

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs. / Week	CREDITS
22PCO2DSE2C	BUSINESS INFORMATION SYSTEM	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To enable the students to trace the growing importance of information system, vital role in decision making, role of computers in this task and its emphasis on the system, development process & approaches.

Prerequisite

Basic knowledge in Business Information System

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and explain the flow of information through business processes.	K1,K4
CO2	Explain the formulate plans for the retrieval and analysis of supporting data	K2, K4
CO3	Apply and develop the networking concepts and technologies to support business needs	K3, K5
CO4	Identify standard project management tools and approaches.	K4
CO5	Develop and classify the computer programs to support or automated business processes	K2, K5

Mapping of CO with PO and PSO

COs / PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	2	3	2	3	3	3
CO2	2	3	3	2	3	2	3	2	3	3
CO3	3	3	3	2	3	3	3	2	2	3
CO4	3	3	3	3	3	3	3	3	3	2
CO5	2	2	3	3	3	3	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction – Information system - Concepts - Types – Information system Framework – Role of E- business – Role of Information system – Functions - Classifications – Challenges and opportunities – Components.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Data Resource Management- Foundation Data concepts – Types of databases – Data warehouses- Data Mining – File processing – Problems of file processing – Database management approach – Database structures.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Networking- Trends in Telecommunications – Value of telecommunication – Internet revolution – business use of the internet – Role of intranet – Role of extranet – Types of telecommunication networks.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Enterprise business system– Enterprise resource planning – Benefits - failures – causes of failure – Customer relationship management – applications in CRM – Benefits and challenges of CRM – truncation processing system – stages.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Electronics commerce system – scope of E-commerce – categories of e commerce - e-commerce processes – electronic payment process – trends in e commerce.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination).	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>Information system resources- Telecommunication media –supply chain management – marketing system - manufacturing system – human resource system.</p>			
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Text Book

1. James A. O'Brien,(2012),Introduction to information systems, 10th Edition, Tata McGraw Hill education private Ltd.
2. Dr. A.K.Gupta,(2010), Management Information systems, 3rd Edition, S. Chand & Company PVT.Ltd.

Reference Books

1. P. Mohan, (2015), Management Information Systems,12th Edition, Himalaya Publishing House.
2. Dr. S.P. Rajagopalan, (2012), Management Information Systems , 2nd Edition, Margham Publications, Chennai.

Web References

1. https://www.tutorialspoint.com/dwh/dwh_data_warehousing.htm
2. <https://bizfluent.com/info-7835940-role-ebusiness-business.html>
3. https://www.tutorialspoint.com/internet_technologies/extranet_overview.htm
4. <https://www.techtarget.com/searchcustomerexperience/definition/CRM-customer-relationship-management>
5. https://www.tutorialspoint.com/e_commerce/e_commerce_payment_systems.htm

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar and Group Discussion.

Course Designer

Mrs. D. Indumathi



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with A Grade by NAAC
ISO 001:2015 Certified
Annamalai Nagar, Trichy -18.

PG & RESEARCH DEPARTMENT OF MATHEMATICS
MINUTES OF THE SEVENTH MEETING OF THE BOS

DATE: 20.10.2022

VENUE: Dr. Rameswari Nallusamy Hall & Gmeet

TIME: 10.30am

Members Present:

- | | |
|---------------------------|--|
| 1. Dr. S. Premalatha | Chairperson, Professor & HOD |
| 2. Dr. A. Tamilselvan | University Nominee |
| 3. Dr. R. Srikanth | Nominated BOS Member, Other University |
| 4. Dr. M. Kamal Kumar | Subject Expert, Other University |
| 5. Dr. N. Shivaranjani | Alumna |
| 6. Ms. S. Priya Dharshini | Industry representative |
| 7. Ms. T. Gokila | Student Representative |
| 8. Ms. M. Sinduja | Student Representative |
| 9. Dr. G. Janaki | Member |
| 10. Dr. V. Geetha | Member |
| 11. Dr. S. Sasikala | Member |
| 12. Dr. S. Saridha | Member |
| 13. Dr. R. Radha | Member |
| 14. Dr. E. Litta | Member |
| 15. Dr. P. Shalini | Member |
| 16. Dr. P. Saranya | Member |
| 17. Dr. S. Vidhya | Member |
| 18. Dr. C. Saranya | Member |
| 19. Dr. L. Mahalakshmi | Member |
| 20. Dr. P. Geethanjali | Member |
| 21. Dr. R. Divya | Member |
| 22. Dr. K. Kalaiarasi | Member |
| 23. Ms. V. Manimozhi | Member |
| 24. Dr. P. Sudha | Member |
| 25. Ms. R. Soundaria | Member |
| 26. Dr. R. Buvaneshwari | Member |

27. Ms. A. Gowri Shankari

Member

The leave of absence was granted to:

1. Dr. R. Uthayakumar,

Subject Expert other University

ACTION TAKEN REPORT OF BOS HELD ON 20.10.2022

The Chairman of the BOS read the minutes of the Seventh meeting of BOS which was held on 20.10.2022, and the following resolutions were confirmed PSO, Programme Structure and Second Semester Syllabus of 2022-2023 batch and onwards framed for

B.Sc Mathematics

M.Sc Mathematics

The syllabus for the Allied Courses II & III offered for other Departments of the 2022-2023 batch and Core Course-VI offered for M.Com of the 2022-2023 batch.

MINUTES OF THE SEVENTH MEETING OF BOS HELD ON 20.10.2022

The following Resolutions were passed by the BOS members

RESOLUTION NO. BOS/07/01

Resolved to approve the Programme Structure (Six semesters) of **B.Sc. Mathematics** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

- Dr. R. Srikanth suggested to include Riemann's Series in sequence and series.
- Dr. A. Tamilselvan suggested to include m-files in MATLAB.
- Dr. M. Kamal Kumar suggested to carryover a one-month Internship Programme (15 days regular and the remaining 15 days in Part-time).

Resolved to carry out the changes in the Programme Structure as given in

Annexure A

RESOLUTION NO. BOS/07/02

Considered and approved the ratification of the I Semester syllabus of **B.Sc. Mathematics** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 Trichy as given in **Annexure A**

Revision of syllabus for

1. **Core course 22UMA1CC1 - Differential Calculus and Trigonometry**

Course Credit changed to four.

2. Core Course 22UMA1CC2 - Integral Calculus

Course Credit changed to four.

- 3.** The title of the paper Mathematical Statistics -II (practical) paper for the first semester was ratified as Mathematical Statistics -Practical and the subject code changed to 22UMA1AC2P instead of 22UMA1AC1P

RESOLUTION NO. BOS/07/03

Resolved to approve the II Semester syllabus of **B.Sc. Mathematics** for the 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure A**

Dr. A. Tamilselvan suggested interchanging the Core Courses Analytical Geometry and Differential Equations and Laplace Transforms

1. First Allied Course 22UMA2AC3 - Mathematical Statistics -II

The Course title Mathematical Statistics-III has been replaced by Mathematical Statistics-II Portions for self-study are given in each unit

Unit I: Extension of Multiplication Law of Probability

Unit II: Characteristic Function of Binomial Distribution - Cumulants of the Binomial Distribution –Recurrence Relation for Cumulants of Binomial Distribution

Unit III: Recurrence formula for the Probabilities of Poisson distribution

Unit IV: Log-normal Distribution

Unit V: Triangular Distribution– Exponential Distribution.

One Textbook is included [1] and in [2] textbook year has changed from 2015 to 2014

1. Gupta, S.C. & Kapoor, V.K. (2018), *Elements of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.
2. Gupta, S.C. & Kapoor, V.K. (2014), *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.

Replaced Unit I by including the Theory of Probability

Topics removed in Unit IV: Points of Inflexion of Normal Curves - Mean Deviation

About the Mean for Normal Distribution - Area Property

(Normal Probability Integral)Error Function - Importance of
Normal Distribution - Correlation and Regression.

Unit V: M.G.F. of Gamma Distribution - Cumulant Generating
Function of Gamma Distribution Additive Property of
Gamma Distribution Exact Sampling Distributions

RESOLUTION NO. BOS/07/04

Considered and approved the Programme Structure (Four Semesters) of the **M.Sc. Mathematics** for the 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**

- Dr. A. Tamilselvan suggested to follow the latest edition textbook in Algebra -II.
- Dr. A. Tamilselvan suggested having Linear Algebra in the first semester and Algebra -I and Algebra -II in the second and third semesters.
- Dr. A. Tamilselvan suggested preparing two mark questions in question bank from CSIR-Related Questions.
- Dr. A. Tamilselvan and Dr. R. Srikanth suggested to have MATLAB (Practical) instead of SageMath.
- Real Analysis -I and Real Analysis -II merged to Real Analysis.
- The text book for Real Analysis is Principles of Mathematical Analysis by Walter Rudin.

RESOLUTION NO. BOS/07/05

Considered and approved the Ratification of the I Semester syllabus of **M.Sc. Mathematics** for the 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women(Autonomous), Trichy as given in **Annexure B**.

RESOLUTION NO. BOS/07/06

Resolved to approve II Semester syllabus of **M.Sc. Mathematics** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**

RESOLUTION. BOS/07/07

To consider and to approve the II Semester syllabus for M.Com of Core Course – VI -22PCO2CC6 - Business Analytics offered by the **Department of Mathematics** for the 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous),

Trichy as given in **Annexure B**

RESOLUTION NO. BOS/07/08

Considered and approved the ratification of I Semester syllabus of **M.Sc. Computer Science** for 2022- 2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 Trichy as given in **Annexure B**

Revision of syllabus for

1. Core Course - 22PCS1CC1 - Mathematical Foundation for Computer Science

Topics removed in Unit III: Subgroups and Homomorphisms – Cosets and Lagrange's Theorem – error recovery in group codes.

RESOLUTION NO. BOS/07/09

Resolved to approve the II Semester syllabus - Allied Course-III (AC) offered by the Department of Mathematics for the 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure C**

Revision of the Syllabus of

1. Allied course -II - 22UCG2AC2 - Statistics

Topics removed in Unit I: Representation of Graphical Method

Topics included in Unit I: Diagrammatic Representation

Text book included - Theory and Practice by R. S. N. Pillai & Bhagavathi

2. Allied Course -III – 22UCH2AC3A - ODE, Laplace Transforms and Statistics

Unit-IV

Statistics (a measure of central tendency and measures of dispersion) instead of

Vector differentiation

Unit-V

Correlation and linear regression instead of measure of central tendency and measures of dispersion

Self-study topic included -Rank Correlation (repeated ranks)

3. Allied Course -III – 22UPH2AC3 - ODE, PDE, Laplace Transforms and Vector Analysis

Unit -II

Partial Differential Equations instead of Laplace Transforms

Unit -III

Instead of Inverse Laplace Transforms, Laplace Transforms to be changed

Unit – IV

Instead of vector Differentiation, Inverse Laplace Transforms to be changed


Unit-V

Vector Differentiation instead of Statistics

RESOLUTION. BOS/07/10

The Chairman appreciated the efforts of the members of BOS, for their valuable contribution in preparing the syllabus.


Dr. A. Tamilselvan
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Bharathidasan University
Jijichirappalli - 620 024


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CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

PG AND RESEARCH DEPARTMENT OF MATHEMATICS



B.Sc., MATHEMATICS
AUTONOMOUS SYLLABUS
(2022-2023 and ONWARDS)

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS**

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc Mathematics, B.Sc Physics,
B.Sc Chemistry PROGRAMME

After completing a B.Sc., programme, a learner will be able to

PO NO.	On completion of B.Sc Mathematics / B.Sc Physics / B.Sc Chemistry Programme, the students will be able to
PO1	DOMAIN KNOWLEDGE Analyse, design and develop solutions by applying from fundamental concepts of basic sciences and expertise in discipline.
PO2	PROBLEM SOLVING Ability to think abstractly, to evaluate and concentrates effectively on problem-solving, as well as knowledge of global challenges.
PO3	CREATIVE THINKING AND TEAM WORK Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	EMPLOYABILITY Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	LIFE LONG LEARNING Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc MATHEMATICS

PSO NO.	The Students of B.Sc Mathematics will be able to	POs Addressed
PSO1	Procure a precise understanding of the mathematical concepts.	PO1, PO3
PSO2	Excel by enhancing interpersonal skills, overcoming procedural challenges and intending career paths.	PO3, PO4
PSO3	Recognize, strengthen and analyse mathematical problems in order to acquire better conclusion.	PO4, PO5
PSO4	Manipulate numerical abilities across a variety of domains.	PO2, PO5
PSO5	Develop and desire to learn more about advanced mathematics and its applications.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

B.Sc MATHEMATICS PROGRAMME STRUCTURE

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)

(For the candidates admitted from the Academic year 2022-2023 Onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total		
							Hrs.	Marks				
								Int	Ext			
I	I	Language Course-I (LC)	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100		
			Hindi Literature & Grammar – I	22ULH1								
			History of Popular Tales, Literature and Sanskrit Story	22ULS1								
			Basic French – I	22ULF1								
	II	English Language Course – I (ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100		
	III	Core Course – I (CC)	Differential Calculus and Trigonometry	22UMA1CC1	5	4	3	25	75	100		
				Core Course – II (CC)	Integral Calculus	22UMA1CC2	4	4	3	25	75	100
				First Allied Course – I (AC)	Mathematical Statistics I	22UMA1AC1	5	4	3	25	75	100
				First Allied Course – II (AP)	Mathematical Statistics (P)	22UMA1AC2P	2	2	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100		
Total					30	22				700		
II	I	Language Course-II (LC)	இடைக்கால இலக்கியமும், புதினமும்	22ULT2	5	3	3	25	75	100		
			Hindi Literature & Grammar – II	22ULH2								
			Poetry, Textual Grammar and Alankara	22ULS2								
			Basic French – II	22ULF2								
	II	English Language Course – II (ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100		
	III	Core Course – III (CC)	Differential Equations and Laplace Transforms	22UMA2CC3	5	5	3	25	75	100		
				Core Course – IV (CC)	Vector Calculus and Fourier Series	22UMA2CC4	4	4	3	25	75	100
				Core Practical –I (CP)	MATLAB Programming (P)	22UMA2CC1P	2	2	3	40	60	100
				First Allied Course – III (AC)	Mathematical Statistics II	22UMA2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100		
Ability Enhancement Compulsory Course-III (AECC)			Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100		
Extra Credit Course			SWAYAM	As per UGC Recommendation								
Total					30	23				800		

III	I	Language Course-III (LC)	காப்பியமும், நாடகமும்	22ULT3	5	3	3	25	75	100		
			Hindi Literature & Grammar – III	22ULH3								
			Prose, Textual Grammar and Vakyarachana	22ULS3								
			Intermediate French – I	22ULF3								
	II	English Language Course – II (ELC)	Learning Grammar Through Literature – I	22UE3	6	3	3	25	75	100		
	III	Core Course – V (CC)	Analytical Geometry (3D)	22UMA3CC5	4	4	3	25	75	100		
				Core Course – VI (CC)	Classical Algebra and Theory of Numbers	22UMA3CC6	5	5	3	25	75	100
				Second Allied Course – I (AC)	Python Programming	22UMA3AC4	5	4	3	25	75	100
				Second Allied Course–II (AP)	Python Programming (P)	22UMA3AC5P	3	2	3	40	60	100
	IV	Generic Elective Course- I (GEC)	Mathematics for Competitive Examinations – I	22UMA3GEC1	2	2	3	25	75	100		
				Basic Tamil-I							22ULC3BT1	
				Special Tamil-I							22ULC3ST1	
		Extra Credit Course	SWAYAM	As per UGC Recommendation								
	Total				30	23					700	

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course-IV (LC)	பண்டைய இலக்கியமும், உரைநடையும்	22ULT4	6	3	3	25	75	100		
			Hindi Literature & Functional Hindi	22ULH4								
			Drama, History of Drama Literature	22ULS4								
			Intermediate French - II	22ULF4								
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100		
	III	Core Course – VII(CC)	Sequences and Series	22UMA4CC7	5	5	3	25	75	100		
				Core Course – VIII(CC)	Methods in Numerical Analysis	22UMA4CC8	5	5	3	25	75	100
				Second Allied Course– III (AC)	Internet of Things	22UMA4AC6	4	3	3	25	75	100
				Internship	Internship	22UMA4INT	-	2	-	-	-	100
	IV	Generic Elective Course- II (GEC)	Mathematics for Competitive Examinations – II	22UMA4GEC2	2	2	3	25	75	100		
				Basic Tamil-II							22ULC4BT2	
				Special Tamil-II							22ULC4ST2	
				Skill Enhancement Course – I (SEC)							Statistical Tools and Techniques - R Programming (P)	22UMA4SEC1P
		Extra Credit Course	SWAYAM	As per UGC Recommendation								
Total				30	25					800		

V	III	Core Course – IX (CC)	Abstract Algebra	22UMA5CC9	6	6	3	25	75	100
		Core Course – X (CC)	Real Analysis	22UMA5CC10	5	5	3	25	75	100
		Core Course – XI (CC)	Statics	22UMA5CC11	5	5	3	25	75	100
		Core Course XII (CC)	Discrete Mathematics	22UMA6CC12	5	5	3	25	75	100
	Discipline Specific Elective – I (DSE)	A. Operations Research	22UMA5DSE1A	5	4	3	25	75	100	
		B. Astronomy	22UMA5DSE1B							
		C. Artificial Intelligence	22UMA5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	LaTeX (P)	22UMA5SEC2P	2	2	3	40	60	100
Extra Credit Course		SWAYAM		As per UGC Recommendation						
Total				30	29				700	
VI	III	Core Course – XIII (CC)	Linear Algebra	22UMA6CC13	5	5	3	25	75	100
		Core Course – XIV(CC)	Complex Analysis	22UMA6CC14	5	5	3	25	75	100
		Core Course –XV (CC)	Dynamics	22UMA6CC15	4	4	3	25	75	100
		Core Course –XVI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
	Discipline Specific Elective – II (DSE)	A. Graph Theory	22UMA6DSE2A	5	4	3	25	75	100	
		B. Number Theory	22UMA6DSE2B							
		C. Fundamentals of Big Data Analytics	22UMA6DSE2C							
	Project	Project Work	22UMA6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	-	-	100
Extension activity			22UGEA	0	1	0	-	-	-	
Total				30	28				700	
Grand Total				180	150				4400	

Note:

Part – I-Language – Tamil/Hindi/French/Sanskrit

Part – II- English

List of Allied Courses:

Allied Course I- Mathematical Statistics

Allied Course II- Computer Science

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	16+1	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV- Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

The Internal and External marks for Theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

FOR THEORY:

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks].

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks].

FOR PRACTICAL:

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks].

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks].

SEMESTER I

CORE COURSE – I (CC)

DIFFERENTIAL CALCULUS AND TRIGONOMETRY

(2022-2023 Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA1CC1	DIFFERENTIAL CALCULUS AND TRIGONOMETRY	CORE	5	4

Course Objective

- **Compute** mathematical quantities using differential calculus and **interpret** their meaning.
- **Explore** fundamental concepts of single variable calculus
- **Apply** calculus concepts to solve real-world problems such as optimization and related rates problems.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the basic concepts of differentiation, extreme functions of two variables.	K2
CO2	Apply the concept of differentiation for explaining curvature/.	K3
CO3	Explore the solution of problems from a mathematical perspective.	K3
CO4	Associate various types of hyperbolic and inverse hyperbolic functions and Solve problems in summation of trigonometric series.	K4
CO5	Examine the conceptual understanding and fluency with trigonometric functions, techniques and manipulations necessary for success in calculus.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	1
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT I

(15 HOURS)

Successive Differentiation:

The n^{th} derivative – Standard results – Method of splitting the fractional expressions into partial fractions – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product – A complete formal proof by induction .

UNIT II

(15 HOURS)

Curvature:

Curvature – Circle, radius and centre of curvature – Cartesian formula for the radius of curvature – The coordinates of the centre of curvature – Evolute and Involute – Radius of curvature when the curve is given in polar coordinates.

UNIT III

(15 HOURS)

Expansions:

Expansions of $\cos n\theta$ and $\sin n\theta$ -Expansion of $\tan n\theta$ in powers of $\tan \theta$ –Expansion of $\tan(A + B + C + \dots)$ (omitting examples on formation of equations) – Powers of sines and cosines of θ in terms of functions of multiples of θ – Expansions of $\cos^n \theta$ when n is a positive integer – Expansions of $\sin^n \theta$ when n is a positive integer – Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ .

UNIT IV

(15 HOURS)

Hyperbolic functions:

Hyperbolic functions – Relation between hyperbolic functions – Relations between hyperbolic functions and circular functions – Inverse hyperbolic functions.

UNIT V

(15 HOURS)

Derivatives for Graphing and Applications:

Maxima and Minima:

Maxima and Minima of functions of two variables – Working Rule – Lagrange's method of undetermined multiplier

Tracing of Curves – Tracing of curves whose equation is in Cartesian coordinates.

UNIT VI

Self Study for Enrichment:

Meaning of the Derivative: Geometrical interpretation – Meaning of the sign of the differential coefficient - p - r equation: Pedal equation of a curve – The expansions of $\sin \theta$ and $\cos \theta$ to find the limits of certain expressions – Logarithms of complex quantities: Logarithms of complex quantities – To find the logarithm of $x+iy$ – General value of logarithm of $x+iy$ – Tracing of Curves : Polar Equation.

Text Books

1. Narayanan. S, .Manicavachagom Pillay. T. K. (2015). *Calculus Volume I*. S. Viswanathan (Printer & publishers) Pvt Ltd.
2. Narayanan. S, .Manicavachagom Pillay. T. K. (2013). *Trigonometry*. S. Viswanathan (Printer & publishers) Pvt Ltd.

UNIT-I Chapter III: Sections 1.1 – 1.6, 2.1, 2.2 [1]

UNIT-II Chapter X: Sections 2.1 – 2.6 [1]

UNIT-III Chapter III: Sections 1 - 4, 4.1, 5 [2]

UNIT- IV Chapter IV: Sections 1,2,2.1,2.2,2.3 [2]

UNIT- V Chapter VIII: Sections 4, 4.1,5 [1]

Chapter XIII: Sections 1.1 & 1.2 [1]

Reference Books

1. Arumugam. S and Issac. (2014). *Calculus*. New Gamma Publishing House.
2. Singaravelu. A. (2003). *Differential Calculus and Trigonometry*. A.Singaravelu and R.Ramaa 1st edition, Nagapattinam, R Publication.
3. Bali. N.P. (2010). *Differential Calculus*. Laxmi Publications (P) Ltd. New Delhi.

Web Links

1. <https://www.youtube.com/watch?v=s8hVridQ5IA>
2. <https://www.youtube.com/watch?v=KijGLjxKlsY>
3. <https://www.youtube.com/watch?v=IQJ0UiM91Z4>
4. <https://www.youtube.com/watch?v=43cMRs2pat4>
5. https://www.youtube.com/watch?v=mAC88G_cc_M
6. <https://www.youtube.com/watch?v=CioY8ElsjO4>
7. https://youtu.be/zExo4_TpOAw

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

1. Dr. P. Sudha

CORE COURSE – II (CC)
INTEGRAL CALCULUS
(2022-2023 Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA1CC2	INTEGRAL CALCULUS	CORE	4	4

Course Objective

- **Analyze** the properties of definite integral and Reduction formulae.
- **Explore** the order of Integration, Triple Integrals, Beta and Gamma functions.
- **Apply** Geometrical Applications of Integration of area under plane curve.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Apply the concepts of double, triple integrals.	K3
CO2	Distinguish the concepts of Beta and Gamma functions.	K3
CO3	Apply the concept of definite integral to solve various problems.	K3
CO4	Interpret the definite integral geometrically as the area under a plane curve.	K3
CO5	Evaluate the types of integration.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	3	2
CO2	3	2	3	3	2	2	2	3	3	3
CO3	3	3	3	3	3	2	3	2	2	2
CO4	3	2	3	3	2	3	3	3	2	2
CO5	3	3	3	3	3	2	2	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT I

(12 HOURS)

Integration: Integration of rational algebraic functions: $\int \frac{dx}{ax^2 + bx + c}$ – $\int \frac{lx + m}{ax^2 + bx + c} dx$ –

Integration of Irrational functions $\int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx$ – Any expression of the form

$\int \frac{dx}{(x - k)\sqrt{ax^2 + bx + c}}$ – $\int \frac{dx}{a + b \cos x}$ (Integration of these types only)

UNIT II

(12 HOURS)

Properties of Definite Integrals – Integration by parts – Reduction formulae.

UNIT III

(12 HOURS)

Multiple Integrals: Definition of the double integrals – Evaluation of the double Integrals – Triple Integrals

UNIT IV

(12 HOURS)

Improper Integrals: Beta and Gamma functions: Definition – convergence of $\Gamma(n)$ – Recurrence formula for gamma functions – Properties of Beta functions – Relation between Beta and Gamma functions – Definite integrals using Gamma functions

UNIT V

(12 HOURS)

Geometrical Applications of Integration – Areas under plane curves: Cartesian Co-ordinates – Area of a closed curve – Examples – Area in polar co-ordinates

UNIT VI

Self-study for Enrichment:

$\int \frac{dx}{a \cos x + b \sin x}$ – Bernoulli's formula – Applications of Multiple Integrals – Applications of Gamma functions to multiple integrals – Approximate Integration.

Text Books

1. Narayanan, S. & Manicavachagom Pillay, T.K.(2015), Calculus, Volume II, S. Viswanathan (Printers & publishers) Pvt Ltd.

UNIT – I Chapter 1: Sections 7.3 (Type I & II) 8 - Case II and case V, 9

UNIT – II Chapter 1: Sections 11, 12, 13 (13.1 – 13.9)

UNIT – III Chapter 5: Sections 2.1, 2.2 & 4

UNIT – IV Chapter 7: Sections: 2.1 – 2.3, 3 – 5

UNIT – V Chapter 2: Sections 1.1 – 1.4

Reference Books

1. Shanti Narayan, Integral Calculus (2002), S. Chand & Company Ltd
2. Shanti Narayan & Mittal, P. K (2008) Integral Calculus, S. Chand & Company Ltd
3. Singh, U. P. Srivastava, R. J & Siddiqui, N. H. (2011) Integral Calculus, Wistom Press.

Web Links

1. <https://youtu.be/w-T90XSM90s>
2. <https://youtu.be/VXSn6EY9klg>
3. <https://youtu.be/2l-SV8csw>
4. <https://youtu.be/bLhxQldbWW8>
5. <https://youtu.be/4KDenLHggDM>
6. https://youtu.be/db7d_a0wiUg
7. <https://youtu.be/zFv-OpajEtA>
8. <https://youtu.be/j6A44yOrGfU>
9. <https://youtu.be/scKJXbOpePM>
10. <https://youtu.be/FsC3do74Ulo>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

1. Dr. P. Shalini

FIRST ALLIED COURSE –I (AC)
MATHEMATICAL STATISTICS I
(2022-2023 Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA1AC1	MATHEMATICAL STATISTICS I	ALLIED	5	4

Course Objective

- **Enable** the students to acquire the knowledge of statistics.
- **Analyze** the properties of various statistical functions.
- **Explore** the concepts of some statistical distributions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	On the successful completion of the course, students will be able to Apply Student's t, Fisher's t and F statistics to derive their probability Distribution..	K3
CO2	Analyze how correlation is used to identify the relationships between variables and how regression analysis is used to predict outcomes.	K3
CO3	Solving mean, median, mode, moments and moment generating functions of discrete and continuous distributions.	K3
CO4	Distinguish between a discrete and a continuous random variable.	K4
CO5	Examine the various properties of expectation, variance and the concept of covariance.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	1
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT I

(18 HOURS)

Random Variables and Distribution Functions

Random Variable – Distribution Functions – Properties of Distribution Function – Discrete Random Variable – Probability Mass Function – Discrete Distribution Function – Continuous Random Variable – Probability Density Function – Various Measures of Central Tendency, Dispersion, Skewness and Kurtosis for Continuous Probability Distribution – Continuous Distribution Function – Joint Probability Mass Function and Marginal and Conditional Probability Function – Joint Probability Distribution Function – Joint Density Function, Marginal Density Function - The Conditional Distribution Function and Conditional Probability Density Function.

UNIT II

(15 HOURS)

Mathematical Expectation

Mathematical Expectation – Addition Theorem of Expectation – Multiplication Theorem of Expectation – Co-variance – Expectation of a Linear Combination of Random Variables – Variance of a Linear Combination of Random Variables – Expectation of a Continuous random variable – Conditional Expectation & Conditional Variance.

UNIT III

(14 HOURS)

Generating Functions

Moment Generating Function – Theorems on moment Generating Functions– Cumulants– Additive Property of Cumulants – Effect of Change of Origin and Scale on Cumulants – Characteristic Function – Properties of Characteristic Function.

UNIT IV

(13 HOURS)

Correlation and Linear Regression

Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson's Co-efficient of Correlation: Limits for Correlation Co-efficient – Assumptions Underlying Karl Pearson's Correlation Co-efficient – Rank Correlation : Spearman's Rank Correlation Co- efficient – Tied or Repeated Ranks – Repeated Ranks (continued) - Introduction – Linear Regression : Regression Co-efficient - Properties of Regression Co-efficient – Angle between two lines of Regression.

UNIT V

(15 HOURS)

Exact Sampling Distributions

Chi-Square Distribution: Introduction – Derivation of the Chi-Square Distribution(χ^2) –M.G.F. of Chi-Square Distribution : Cumulant Generating Function of χ^2 -Distribution – Limiting Form of χ^2 -Distribution for–Characteristic Function of χ^2 -Distribution – Mode and Skewness of χ^2 -Distribution – Additive Property of χ^2 Variates – Chi- Square Probability Curve – Students 't' Distribution : Derivation of the Students 't' Distribution – Fisher's 't' – Distribution

of Fisher's 't' – Constants of t-distribution – Limiting Form of t-distribution – F- Distribution : Derivation of Snedecor's F- Distribution – Constants of F- Distribution – Mode and Points of Inflexion of F- Distribution.

UNIT VI

Self-Study for Enrichment:

Independent Random Variables – Uniqueness Theorem of Characteristic Function – Limits for the Rank Correlation Coefficient – Graph of t-distribution – Critical Values of t .

Text Books

1. Gupta, S.C. & Kapoor, V.K. (2004). *Elements Of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.
2. Gupta, S.C. & Kapoor, V.K. (2015). *Fundamentals Of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.

UNIT-I Chapter 5: Sections 5.1 to 5.5.3, 5.5.5 [1]

UNIT-II Chapter 6: Sections 6.1 to 6.8 [1]

UNIT-III Chapter 6: Sections 6.9 to 6.11.1 [1]

UNIT- IV Chapter 10: Sections 10.1 to 10.4.2 & 10.7, 10.7.1 to 10.7.3 [2]

Chapter 11: Sections 11.1 to 11.2.3 [2]

UNIT- V Chapter 15: Sections 15.1 to 15.3.6 [2]

Chapter 16: Sections 16.2 to 16.2.5, 16.5, 16.5.1 to 16.5.3 [2]

Reference Books

1. Pillai, R.S.N. Pillai & Bhagavathi. (2008). *Statistics, Theory and Practice*. S.Chand & Sons.
2. Bhishma Rao, G.S.S. (2011). *Probability and Statistics*. Scitech Publications (India) Pvt Ltd.
3. Veerarajan, T. (2010). *Probability, Statistics and Random Processes*. Tata McGraw Hill Education Private Limited.

Web Links

1. <https://www.youtube.com/watch?v=YXLVjCKVP7U>
2. <https://www.youtube.com/watch?v=xTpHD5WLuoA>
3. <https://www.youtube.com/watch?v=wjwLTNYOuI4>
4. <https://www.youtube.com/watch?v=zmyh7nCjmsg>
5. <https://www.youtube.com/watch?v=ux8zQvWWLk>

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment and Smart Classroom.

Course Designer

1. Ms. V. ManiMozhi

FIRST ALLIED COURSE – II (AC)
MATHEMATICAL STATISTICS (P)
(2022-2023 Onwards)

Semester I	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA1AC2P	MATHEMATICAL STATISTICS (P)	ALLIED	2	2

Course Objective

- **Understands** the basic concepts in quantitative data analysis.
- **Apply** the technical knowledge to **interpret** and **solve** the problems.
- **Explore** the ideas of Excel in Statistics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explore various statistical concepts in Excel.	K3
CO2	Solve the Measures of Central Tendency and Measures of Dispersion using Excel.	K3
CO3	Compute Correlation and Regression co-efficient between two data sets and their applications.	K3
CO4	Analyze the concepts of testing the hypothesis and apply the test to the real-life problems.	K4
CO5	Make use of formulas, including the use of built-in functions.	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	2	3	2	2	2	3	2	2	2
CO2	1	2	3	2	2	2	3	2	2	2
CO3	1	2	3	2	2	2	3	2	2	2
CO4	1	2	3	2	2	2	3	2	2	2
CO5	1	2	3	2	2	2	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

LIST OF PROGRAMS

- 1) Arithmetic Mean, Geometric Mean and Harmonic Mean.
- 2) Median and Mode.
- 3) Quartile Deviation and Mean Deviation.
- 4) Standard Deviation and Co-efficient of Variation.
- 5) Karl Pearson's Co-efficient of Skewness.
- 6) Bowley's Co-efficient of Skewness.
- 7) Moments and Kurtosis.
- 8) Karl Pearson's Co-efficient of correlation.
- 9) Rank Correlation.
- 10) Fit the regression line.
- 11) Test the hypothesis for the difference between two sample means.
- 12) Test the hypothesis for single proportion.
- 13) Test the significance of hypothesis using 't' test.
- 14) Test the significance of hypothesis using 'F' test.
- 15) Test the significance of hypothesis using chi-square test.

Text Books

1. Asha Chawla. & Seema Malik. (2017). *Statistical Analysis with MS Excel*. Avichal Publishing Company.

Reference Books

1. Web Tech Sol. (2010). *Mastering Microsoft Excel Functions and Formulas*. Khanna Book Publishing Company.
2. Neil J. Salkind. (2015). *Excel Statistics a Quick Guide*. SAGE Publications, Inc.
3. Charles Zaiontz. (2015). *Statistics using Excel Succinctly*. E-Book.

Web links

1. <https://www.youtube.com/watch?v=2rEhWFhSqnl>
2. <https://www.youtube.com/watch?v=L9TiYC6tQmU>
3. <https://www.youtube.com/watch?v=v5kYz3ADPBI>
4. <https://www.youtube.com/watch?v=9cXluqvGe8c>
5. <https://www.youtube.com/watch?v=egAvfCZTpz8>
6. <https://www.youtube.com/watch?v=7Y1g340tcbU>
7. <https://www.youtube.com/watch?v=QnsH74zXhA>
8. https://www.youtube.com/watch?v=BIS11D2VL_U
9. <https://www.youtube.com/watch?v=WNUfgZipww>

10. <https://www.youtube.com/watch?v=j966OJol0iA>
11. <https://www.youtube.com/watch?v=mUycvaTRrCw>
12. <https://www.youtube.com/watch?v=ckcUt3EyD-Q>

Pedagogy

Power point presentations, Live Demo, Hands on training.

Course Designers

1. Dr. P. Saranya
2. Dr. C. Saranya

SEMESTER II
CORE COURSE – III (CC)
DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS
(2022-2023 Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA2CC3	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	CORE	5	5

Course Objective

- **Explain** the basics of Ordinary Differential Equations.
- **Emphasize** in the field of Partial Differential Equations.
- **Explore** the mathematical methods formatted for major concepts.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain various notions in ODE, PDE, Laplace transforms.	K1,K2
CO2	Classify the problem models in the respective area.	K3
CO3	Identify the properties of solutions in the field of mathematics.	K3
CO4	Solve various types of problems involving differential equations.	K3
CO5	Analyze the applications of the Differential equations in practical life.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Equations of the first order but of higher degree:</p> <p>Equations solvable for dy/dx – Equations solvable for y – Equations solvable for x – Clairaut's form – Extended form of Clairaut's form – Exact differential equations – Conditions of integrability of $M dx + N dy = 0$ – Practical rule for solving an exact differential equation – Rules for finding integrating factors - simple problems.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Linear equations with constant coefficients:</p> <p>Definition – The operator D – Complementary function of a linear equation with constant coefficients – Particular integral – General method of finding P.I. – Special methods for finding P.I. of the forms e^{ax}, $\cos ax$ or $\sin ax$, $e^{ax} V$, x^m – Linear equations with variable coefficients – Methods of finding particular integrals – Method of Variation of Parameters (Omit third & higher order equations).</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Partial differential equations of the first order:</p> <p>Classification of Integrals – Derivation of partial differential equations – By elimination of constants – By elimination of an arbitrary function – Lagrange's method of solving the linear equation – Special methods for some standard forms $F(p, q) = 0$, $F(x, p, q) = 0$, $F(y, p, q) = 0$, $F(z, p, q) = 0$, $f_1(x, p) = f_2(y, q)$</p> <p>Clairant's form – Equations reducible to the standard forms – Charpit's method .</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Partial differential equations of higher order:</p> <p>Introduction – Homogeneous differential equation – Methods of finding C.F. – Methods of finding P.I. of the forms</p>	15	CO1, CO2, CO3, CO4,	K1, K2, K3, K4

	e^{ax+by} , $x^r y^s$, $\sin(ax+by)$ or $\cos(ax+by)$, $e^{ax+by} \varphi(x,y)$.		CO5	
V	Laplace transforms & inverse laplace transforms: Definition – Piecewise continuity – Sufficient conditions for the existence of the Laplace Transforms – Basic results – Laplace Transform of periodic functions – Some general theorems & simple applications – Evaluation of certain integrals using Laplace Transform – The Inverse Laplace Transforms –Modification of results in Laplace Transform to get the inverse Laplace Transform - Use of Laplace Transforms in solving ODE with constant coefficients.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examination) Equations that do not contain x explicitly- Equations that do not contain y explicitly- Equations homogeneous in x and y - Special method of evaluating the P.I. when X is of the form x^m –Solving of few standard forms from Charpit’s method - Methods of finding P.I. of the forms $\sin ax \sin by$ or $\cos ax \cos by$ - Use of Laplace Transforms in solving system of differential equations.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanan, S and Manicavachagom Pillay, T.K (2016). *Differential Equations And Its Applications*. S.Viswanathan Publishers Pvt. Ltd.
2. Arumugam, S and Thangapandi Isaac, A (2014). *Differential Equations And Applications*. New Gamma publishing House.

UNIT-I Chapter IV: Sections 1 - 3 [1]

Chapter II: Section 6 [1].

UNIT-II Chapter V: Sections 1-5 [1] (Omit 5.5)

Chapter VIII: Section 4 [1] (Omit 6.1)

UNIT-III Chapter XII: Sections 1-6 [1]

UNIT- IV Chapter V: Sections 1-2 [2]

UNIT- V Chapter IX: Sections 1-8 [1]

Reference Books

1. Raisinghania M.D. (2008). *Ordinary and Partial Differential Equations*. S.Chand & Company.

Web Links

1. <https://youtu.be/aYrsPeE7NLO>
2. https://youtu.be/913LV_0QDO0
3. <https://youtu.be/JEyzOtRPnjik>
4. <https://youtu.be/6rTtLQr8uq0>
5. <https://youtu.be/ZDHmF5PBk-8>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

1. Dr. R.Divya

CORE COURSE – IV (CC)
VECTOR CALCULUS AND FOURIER SERIES
(2022-2023 Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA2CC4	VECTOR CALCULUS AND FOURIER SERIES	CORE	4	4

Course Objective

- **Explain** the basics principles of vector calculus.
- **Explore** the mathematical methods with vector integration.
- **Understand** the concepts and properties of Fourier Series.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember and recall the concepts of Vector Calculus and Fourier Series.	K1
CO2	Solve various types of problems in the Core area.	K3
CO3	Explain the concepts of odd and even functions.	K3
CO4	Describe the development of series.	K3
CO5	Examine the concepts of integration for finding solution.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	2	3	3	2	2	3
CO3	3	2	3	3	2	3	3	3	3	2
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Vector Differentiation: Vector valued function of a single scalar variable.</p> <p>Differential Operators: Definition – The Vector differential operator – The operator $a \cdot \nabla$, where a is a unit vector – The Gradient of a scalar point function – Equation of tangent plane and normal – Divergence and Curl of a vector .</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Vector Integration: Vector Integration – Line integrals-Normal Surface</p> <p>Integral $\int_S \vec{F} \cdot \hat{n} \, dS$ - Flux across a Surface-Volume</p> <p>Integral $\int_V F \, dV$ (Simple Problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Vector Integration: Gauss's Divergence Theorem $\int_S \vec{F} \cdot \hat{n} \, dS = \int_V \text{div } \vec{F} \, dV$ - Stoke's theorem $\int_C \vec{F} \cdot \hat{t} \, dr = \int_S \text{curl } \vec{F} \cdot \hat{n} \, dS$ - Green's theorem - Stoke's theorem in space.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Fourier series: Fourier series – definition - Fourier Series expansion of periodic functions with Period 2π and period $2a$ – Odd & even functions in Fourier Series.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Fourier series: Half- range Fourier Series – definition - Development in Cosine series - Development in Sine series - Change of interval.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self Study for Enrichment: (Not included for End Semester Examination)</p> <p>Theorems on differentiation- Properties of grad ϕ - Stoke's theorem in Cartesian form - Properties of odd and even functions- Combination of Series.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Khanna. M.L., *Vector Calculus*, Jai Prakash Nath and Co., 8th Edition, (1986).
2. Narayanan.S, Manicavachagam Pillai. T.K., *Calculus*, Vol.III, S.Viswanathan (Printers and Publishers) Pvt Limited, (2014).

UNIT-I	Chapter I: Section 1 [1] Chapter II: Sections 2-4, 6,7[1]
UNIT-II	Chapter III: Sections 1 – 4 [1]
UNIT-III	Chapter III: Sections 5 - 7 [1]
UNIT- IV	Chapter IV: Sections 1-3 [2]
UNIT- V	Chapter IV: Sections 4-6 [2]

Reference Books

1. Duraipandian. P & Lakshmi Duraipandian, *Vector Analysis*, Emerald Publishers (1998).
2. Vittal. P.R. & V.Malini, *Vector Analysis*, Margham Publications (2014).
3. Sankarappan. S & Arulmozhi. G. (2006). *Vector Calculus, Fourier Series and Fourier Transforms*, Vijay Nicole imprints Private Limited, Chennai.

Web References:

1. <https://www.youtube.com/watch?v=FfJtVvOtgTM&list=PLU6SqdYcYsfJz9FAzbgocIjlkW4NXAar->
2. <https://www.youtube.com/watch?v=9LqzrAhrSS0&list=PLeIE3weEKO4YnuLABAWpFuN9ufYJjg1SR>
3. https://www.youtube.com/watch?v=KCS-VTm398I&list=PLhSp9OSVmeyLke5_cby8i8ZhK8FHpw3qs
4. https://www.rtu.ac.in/expert/app/documents/kjangid@rtu.ac.in_51629122020100932am.pdf

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

1. Dr. R. Radha

CORE PRACTICAL – I (CP)
MATLAB PROGRAMMING (P)
(2022-2023 Onwards)

Semester II	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UMA2CC1P	MATLAB Programming (P)	Core Practical – I (CP)	2	2

Course Objective

- Apply MATLAB as a simulation tool.
- Compute mathematical solutions using MATLAB and develop inter-disciplinary skills.
- Determine syntax, semantics, data-types and library functions of numerical computing.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain fundamental concepts of MATLAB.	K2
CO2	Illustrate a great numbers of MATLAB commands and how to use them in programming and in many applications in Mathematics.	K2
CO3	Compute simple program for a given problem in MATLAB coding.	K3
CO4	Determine the result and the outcome of any command or script.	K4
CO5	Deduce Mathematical solutions using MATLAB tools.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Listings:

1. Finding the leap year.
2. Operations using Matrices (Addition, Subtraction, Multiplication, Transpose and Inverse)
3. Basic plotting of variables (Simple and multiple data set).
4. Sorting of given data.
5. Finding the sum of n numbers, sum of square of n numbers, sum of 'n' odd numbers.
6. Finding the roots of a polynomial equation.
7. Solving system of equations using matrices.
8. Finding the Eigen vectors and Eigen values.
9. Generating Fibonacci series.
10. Vector operations.
11. Evaluation of integrals.
12. Finding the derivatives of given order.
13. Operations on sets.

Web Links

1. <https://www.youtube.com/watch?v=Rd61S1yS24>
2. <https://www.youtube.com/watch?v=EF4wmV5xBM0>
3. <https://www.youtube.com/watch?v=XsrhAO3r3VY>
4. <https://www.youtube.com/watch?v=aEjeuj5jfLU>
5. <https://www.youtube.com/watch?v=ZBafH5fss1E>
6. <https://www.youtube.com/watch?v=XtiAC4adozQ>
7. <https://www.youtube.com/watch?v=kt8QSkM6c>
8. <https://www.youtube.com/watch?v=y4Sy9xo-pFU>
9. <https://www.youtube.com/watch?v=pi6Dkvs6rP4>
10. <https://www.youtube.com/watch?v=YzEp0jiVvYs>
11. <https://www.youtube.com/watch?v=LFoutvnfP6A>
12. <https://www.youtube.com/watch?v=7BJUX3oIlz0>

Pedagogy

Power point presentations, Live Demo, Hands on Training.

Course Designer

1. Dr. P. Saranya

FIRST ALLIED COURSE –III (AC)
MATHEMATICAL STATISTICS II
(2022-2023 and Onwards)

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UMA2AC3	MATHEMATICAL STATISTICS II	ALLIED	4	3

Course Objectives

- **Enable** in-depth knowledge of probability.
- **Explore** the concepts of some statistical data.
- **Analyse** the properties of discrete and continuous distributions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic concepts in probability, some special distributions, and sampling distributions.	K1
CO2	Explain the properties of probability, special distributions and the theory of sampling distributions to find solutions of real-life problems.	K2
CO3	Solve problems in probability, some special distributions and sampling distributions.	K3
CO4	Examine the given data and interpret the results	K4
CO5	Analyze probability, and various distributions in the case of solid conclusions about the values of the population parameter.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	1
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Theory of probability: Introduction – Short History – Definitions of Various Terms – Mathematical or Classical or ‘a Priori’ Probability – Statistical or Empirical Probability – Mathematical Tools: Preliminary Notion of sets – Sets and Elements of Sets – Operations on Sets – Algebra of Sets - Axiomatic approach to Probability – Random Experiment (Sample Space) – Event – Some Illustrations – Algebra of Events – Probability : Mathematical Notion – Probability Function – Laws of Addition of Probabilities – Extension of General Law of Addition of Probabilities – Law of Multiplication or Theorem of Compound Probability - Independent Events – Pairwise Independent Events – Mutually Independent Events – Baye’s theorem.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Special Discrete Probability Distributions: Introduction – Discrete uniform Distribution- Bernoulli Distribution : Moments of Bernoulli Distribution - Binomial Distribution : Moments of Binomial Distribution – Recurrence Relation for the Moments of Binomial Distribution – Factorial Moments of Binomial Distribution – Mean Deviation about Mean of Binomial Distribution – Mode of Binomial Distribution – Moment Generating Function of Binomial Distribution – Additive Property of Binomial Distribution	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Special Discrete Probability Distributions: Poisson Distribution: The Poisson Process – Moments of the Poisson Distribution – Mode of the Poisson Distribution – Recurrence Relation for Moments of the Poisson Distribution – Moment Generating Function of the Poisson Distribution – Characteristic Function of the Poisson Distribution –	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	Cumulants of the Poisson Distribution – Additive or Reproductive Property of Independent Poisson Variates.			
IV	<p>Special Continuous Probability Distributions:</p> <p>Introduction –Normal Distribution: Normal Distribution as a Limiting Form of Binomial Distribution – Chief Characteristics of the Normal Distribution – Mode of Normal Distribution – Median of Normal Distribution – M.G.F. of Normal Distribution – Cumulant Generating Function (c.g.f.) of Normal Distribution – Moments of Normal Distribution – A Linear Combination of Independent Normal Variates - Fitting of Normal Distribution.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Special Continuous Probability Distributions:</p> <p>Rectangular (or Uniform) Distribution: Moments of Rectangular Distribution – M.G.F. of Rectangular Distribution – Characteristic Function of Rectangular Distribution – Mean Deviation (about Mean) of Rectangular Distribution–Gamma Distribution(only definition)– Beta Distributions of first kind : Constants of Beta Distributions of first kind – Beta Distributions of second kind : Constants of Beta Distributions of Second kind.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self-Study for Enrichment: (Not included for End Semester Examinations)</p> <p>Extension of Multiplication Law of Probability – Characteristic Function of Binomial Distribution – Cumulants of the Binomial Distribution – Recurrence Relation for Cumulants of Binomial Distribution – Recurrence formula for the Probabilities of Poisson distribution –Log-normal Distribution – Triangular Distribution– Exponential Distribution.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Gupta, S.C. & Kapoor, V.K. (2018). *Elements of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.
2. Gupta, S.C. & Kapoor, V.K. (2014). *Fundamentals of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.

UNIT-I	Chapter 4: Section 4.1 -4.8 (omit 4.7.1)[1]
UNIT-II	Chapter 8: Sections 8.1 to 8.3, 8.4(8.4.1 to 8.4.7) [2]
UNIT-III	Chapter 8: Sections 8.5 (8.5.1 to 8.5.8)[2]
UNIT- IV	Chapter 9: Sections 9.1 and9.2 (9.2.1 to 9.2.8,9.2.14)[2]
UNIT- V	Chapter 9: Sections 9.3, 9.5, 9.6 -9.7[2]

Reference Books

1. Pillai. R.S.N. Pillai & Bhagavathi. (2008). *Statistics, Theory and Practice*. S.Chand & Sons.
2. Bhishma Rao. G.S.S. (2011). *Probability and Statistics*. Scitech Publications (India) Pvt Ltd.
3. Veerarajan. T. (2010). *Probability, Statistics and Random Processes*. Tata McGraw Hill Education Private Limited.

Web References

1. <https://www.youtube.com/watch?v=ZKkiCC6uCaU&list=PLpEFFNathorfhzVYKNRFgtWJp2R1vTZfj>
2. <https://www.youtube.com/watch?v=jmqZG6roVqU>
3. <https://www.youtube.com/watch?v=gHBL5Zau3NE>
4. <https://www.youtube.com/watch?v=3PWKQiLK41M>
5. <https://www.youtube.com/watch?v=dOr0NKvD31Q>
6. <https://www.statisticshowto.com/probability-and-statistics/statistics-definitions/uniform-distribution/>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz and Assignment.

Course Designer

1. Ms. V. ManiMozhi

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

(Nationally Re-accredited (III cycle) with 'A' (CGPA 3.41 out of 4)

Grade by NAAC



PG AND RESEARCH DEPARTMENT OF MATHEMATICS B.Sc MATHEMATICS SYLLABUS 2021-2022 ONWARDS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS
PROGRAMME OUTCOMES

PO1	Demonstrate basic manipulative skills in algebra, geometry and trigonometry.
PO2	Communicate mathematical principles and ideas with clarity and coherence, both written and verbally, demonstrating communication skills to be used in any future career.
PO3	Demonstrate proficiency in linear algebra, real and complex analysis as well as areas of modern, proof-based Mathematics.
PO4	Compute limits and derivatives using their definitions, and use the fundamental theorem of calculus to compute definite and indefinite integrals.
PO5	Construct counter examples to mathematical statements and understand the importance of hypotheses into a viable career path.

CAUVERY COLLEGE FOR WOMEN(AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS COURSE STRUCTURE
(For the candidates admitted in the year 2021-2022)

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam	Marks		Total	
					Hrs		Hours	Int	Ext		
I	I	Language Course – I (LC) – Tamil*/Other Languages +#	இக்கால இலக்கியம்	19ULT1/ 19ULH1/ 19ULS1/ 19ULF1	6	3	3	25	75	100	
			Story, Novel, History of Hindi Literature-I & Grammar – 1								
			History of Popular Tales Literature and Sanskrit Story								
			Communication in French –I								
	II	English Language Course - I (ELC)	Functional Grammar for Effective Communication –I	19UE1	6	3	3	25	75	100	
	III	Core Course – I (CC)	Differential Calculus and Trigonometry	19UMA1CC1	5	5	3	25	75	100	
			Core Course – II (CC)	Integral Calculus and Fourier Series	19UMA1CC2	6	6	3	25	75	100
			First Allied Course – I (AC)	Mathematical Statistics – I	19UMA1AC1	5	3	3	25	75	100
	IV	UGC Jeevan Kaushal Life skills	Universal Human Values	20UGVE	2	2	3	25	75	100	
					TOTAL	30	22	-	-	-	600

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total		
					Hrs			Int	Ext			
II	I	Language Course – II (LC) - Tamil*/Other Languages +#	இடைக்கால இலக்கியமும், புதினமும்	19ULT2/ 19ULH2/ 19ULS2/ 19ULF2	6	3	3	25	75	100		
			Prose, Drama, History of Hindi Literature –II & Grammar - 2									
			Poetry, Textual Grammar and Alakara									
			Communication in French –II									
	II	English Language Course – II(ELC)	Functional Grammar for Effective Communication –II	19UE2	6	3	3	25	75	100		
	III	Core Course – III (CC)	Analytical Geometry and Vector Calculus	20UMA2CC3	6	6	3	25	75	100		
				First Allied Course – II (AP)	Mathematical Statistics-II (Practical)	19UMA2AC1P	5	3	3	40	60	100
						First Allied Course – III (AC)	Mathematical Statistics-III	19UMA2AC2	5	3	3	25
	IV	Environmental Studies	Environmental Studies	21UGES	2	2	3	25	75	100		
	V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations							
			TOTAL	30	20	-	-	-	600			

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total	
					Hrs			Int	Ext		
III	I	Language Course – III (LC) – Tamil*/Other Languages + #	காப்பியமும், நாடகமும்	19ULT3/ 19ULH3/ 19ULS3/ 19ULF3	6	3	3	25	75	100	
			Medieval, Modern Poem, Poetics & History of Hindi Literature – 3								
			Prose, Textual Grammar and Vakyarachana								
			Communication in French –III								
	II	English Language Course - III(ELC)	Reading and Writing For Effective Communication- I	19UE3	6	3	3	25	75	100	
	III	Core Course – IV (CC)	Differential Equations and Laplace Transforms	19UMA3CC4	5	5	3	25	75	100	
			Classical Algebra and Theory of Equations	19UMA3CC5	5	5	3	25	75	100	
		Second Allied Course – I (AC)	Python Programming	21UMA3AC3	4	4	3	25	75	100	
		Second Allied Course – II (AP)	Python Programming LAB	21UMA3AC2P	2	2	3	40	60	100	
	IV	Non Major Elective I – for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil up to 10 th , +2 but opt for other languages in degree programme	Mathematics for competitive Examinations-I	19UMA3NME1	2	2	3	25	75	100	
			Basic Tamil	19ULC3BT1							
			Special Tamil	19ULC3ST1							
	V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations						
	TOTAL					30	24	-	-	-	700

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext	
IV	I	Language Course – IV(LC) - Tamil*/Other Languages +#	பண்டைய இலக்கியம்	19ULT4/ 19ULH4/ 19ULS4/ 19ULF4	6	3	3	25	75	100
			Letter Writing, Precise Writing, General Essays, Technical Terms, Proverbs, Amplifications, Idioms & Phrases, History of Hindi Literature – 4							
			Drama, History of Drama Literature							
			Communication in French –IV							
	II	English Language Course – IV(ELC)	Reading and Writing For Effective Communication- II	19UE4	6	3	3	25	75	100
	III	Core Course – VI (CC)	Sequences and Series	21UMA4CC6	6	5	3	25	75	100
		Core Course – VII (CC)	Methods in Numerical Analysis	21UMA4CC7	4	3	3	25	75	100
		Second Allied Course – III (AC)	Internet of Things	21UMA4AC4	4	3	3	25	75	100
	IV	Skill Based Elective-I (SBE)	Introduction to R	21UMA4SBE1A	2	2	3	25	75	100
			Introduction to Statistical Tools and Techniques – SPSS	21UMA4SBE1B						
		Non Major Elective II – for those who studied Tamil under Part I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil up to 10 th , +2 but opt for other languages in degree programme	Mathematics for competitive Examinations-II	19UMA4NME2	2	2	3	25	75	100
			Basic Tamil	19ULC4BT2						
	Special Tamil		19ULC4ST2							
V	Extra Credit Course	Swayam Online Course	To be fixed Later	As Per UGC Recommendations						
TOTAL					30	21	-	-	-	700

15 Days INTERNSHIP during Semester Holidays

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext.	
V	III	Core Course – VIII (CC)	Abstract Algebra	21UMA5CC8	6	5	3	25	75	100
		Core Course – IX (CC)	Real Analysis	21UMA5CC9	5	5	3	25	75	100
		Core Course – X (CC)	Statics	21UMA5CC10	5	4	3	25	75	100
		Core Course – XI (CC)	Discrete Mathematics	21UMA5CC11	4	3	3	25	75	100
		Major Based Elective- I	Fuzzy Set Theory and its Applications	21UMA5MBE1A	4	3	3	25	75	100
	Astronomy		21UMA5MBE1B							
	Artificial Intelligence		21UMA5MBE1C							
	IV	Skill Based Elective-II	Statistical Tools and Techniques – R Programming (Practical)	19UMA5SBE2AP	2	2	3	40	60	100
			Statistical Tools and Techniques – SPSS (Practical)	19UMA5SBE2BP						
		Skill Based Elective -III	LaTeX (Practical)	21UMA5SBE3AP	2	2	3	40	60	100
			Numerical methods with MATLAB Programming (Practical)	21UMA5SBE3BP						
		UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100
		V	Extra credit course	Swayam Online Course	To be fixed Later	As per UGC Recommendations				
	Internship			To be fixed Later	-					
TOTAL					30	26	-	-	-	800

Sem	Part	Course	Course Title	Course Code	Ins.	Credit	Exam Hours	Marks		Total
					Hrs			Int	Ext.	
VI	III	Core Course – XII (CC)	Linear Algebra	21UMA6CC12	5	5	3	25	75	100
		Core Course – XIII (CC)	Complex Analysis	21UMA6CC13	6	5	3	25	75	100
		Core Course – XIV (CC)	Dynamics	21UMA6CC14	5	5	3	25	75	100
		Core Course – XV (CC)	Operations Research	21UMA6CC15	5	4	3	25	75	100
		Major Based Elective-II	Graph Theory	21UMA6MBE2A	4	3	3	25	75	100
			Mathematical Modelling	21UMA6MBE2B						
			Fundamentals of Big Data Analytics	21UMA6MBE2C						
		Major Based Elective-III	Probability and Queuing Theory	21UMA6MBE3A	4	3	3	25	75	100
			Number Theory	21UMA6MBE3B						
			Web Technology	21UMA6MBE3C						
	V	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
		Extension Activities	Extension Activities	19UGEA	-	1	-	-	-	-
	TOTAL					30	27	-	-	-
GRAND TOTAL					180	140	-	-	-	4100

List of Allied Courses

Group I (Any one)

1. Physics
2. Mathematical Statistics
3. Financial Accounting

Group II (Any one)

1. Chemistry
2. Computer Science
3. Management Accounting

Language Part – I	-	4	
English Part –II	-	4	
Core Paper	-	15	
Allied Paper	-	4	
Allied Practical	-	2	
Non-Major Elective	-	2	
Skill Based Elective	-	3	
Major Based Elective	-	3	
Environmental Studies	-	1	
Universal Human Values	-	1	
Professional Skills	-	1	
Gender Studies	-	1	
Extension Activities	-	1	(Credit only)

➤ For those who studied Tamil up to 10th, +2 (Regular Stream)

+ Syllabus for other Languages should be on par with Tamil at degree level

those who studied Tamil up to 10th, +2 but opt for other languages in degree level under Part I should study special Tamil in Part IV

** Extension Activities shall be outside instruction hours

Non Major Elective I & II – for those who studied Tamil under Part I

- a) Basic Tamil I & II for other language students
- b) Special Tamil I & II for those who studied Tamil up to 10th or +2 but opt for other languages in degree programme

Note:

	Internal Marks	External Marks
1. Theory	25	75
2. Practical	40	60
3. Separate passing minimum is prescribed for Internal and External marks		

FOR THEORY

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks]

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks]

FOR PRACTICAL

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks]

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks]

SEMESTER I
DIFFERENTIAL CALCULUS AND TRIGONOMETRY
2019-2020 Onwards

Semester – I	DIFFERENTIAL CALCULUS AND TRIGONOMETRY	Hours/Week – 5	
CORE COURSE-I		Credits – 5	
Course Code – 19UMA1CC1		Internal 25	External 75

Objectives:

- To inculcate the basics of differentiation and their applications.
- To introduce the notion of curvature, Evolutes and Involutives in polar co-ordinates.
- To understand the basic concepts of Trigonometry.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the basic concepts of differentiation, extreme functions of two variables.	K3
CO2	Apply the concept of differentiation for explaining curvature.	K3
CO3	Distinguish the trigonometric functions, related problems.	K3
CO4	Associate various types of hyperbolic and inverse hyperbolic functions and Solve problems in summation of trigonometric series.	K4
CO5	Examine the conceptual understanding and fluency with trigonometric functions, techniques and manipulations necessary for success in calculus.	K4

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	S	S	M	S
CO3	S	S	M	M	S
CO4	S	S	M	M	S
CO5	M	M	S	S	M

S-Strong, M-Medium, L-Low

CORE COURSE-I (CC)
DIFFERENTIAL CALCULUS AND TRIGONOMETRY
SYLLABUS

UNIT I

Successive Differentiation: The n^{th} derivative – Standard results – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product – A complete formal proof by induction.

Meaning of the Derivative: Geometrical interpretation – Meaning of the sign of the differential coefficient. Maxima and Minima of functions of two variables.

UNIT II

Curvature – Circle, radius and centre of curvature – Cartesian formula for the radius of curvature – The coordinates of the centre of curvature – Evolute and Involute - Radius of curvature when the curve is given in polar coordinates.

UNIT III

Expansions of $\cos n\theta$ and $\sin n\theta$ – Expansion of $\tan n\theta$ in powers of $\tan \theta$ – Expansion of $\tan(A + B + C + \dots)$ (omitting examples on formation of equations) - Powers of sines and cosines of θ in terms of functions of multiples of θ – Expansion of $\sin^n \theta$ and $\cos^n \theta$ when n is a positive integer – Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ .

UNIT IV

Hyperbolic functions – Relation between hyperbolic functions – Inverse hyperbolic functions.

UNIT V

Logarithms of complex quantities - To find the logarithm of $x + iy$ – General value of logarithm of $x + iy$ – Summation of Trigonometrical Series – Method of differences – Some of series of n angles in arithmetic progression – Sum of cosines of n angles in arithmetic progression – Gregory's series.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S. Narayanan, T. K.Manicavachagom Pillay	Calculus, Volume I	S. Viswanathan (Printer & publishers), Pvt Ltd	2015
2.	S. Narayanan, T. K.Manicavachagom Pillay	Trigonometry	S. Viswanathan (Printer & publishers), Pvt Ltd	2013

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	3	1.1 – 1.6 [1]
	4	2.1 & 2.2 [1]
	8	4 & 4.1[1]
II	10	2.1 - 2.6 [1]
III	3	1, 2, 3, 4, 4.1, 5 & 5.1 [2]
IV	4	1, 2, 2.1 - 2.3 [2]
V	5	5, 5.1, 5.2 [2]
	6	1, 2, 3.1 [2]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	S. Arumugam and Issac	Calculus, Volume I	New Gamma Publishing House	1991
2.	S. Narayanan, T.K. Manichavasagam Pillai	Trigonometry	S. Viswanathan Pvt Limited and Vijay Nicole Imprints Pvt Limited	2004
3.	A.Singaravelu and R.Rama	Differential Calculus and Trigonometry	R publications, Nagapattinam	2003

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

CORE COURSE-II (CC)
INTEGRAL CALCULUS AND FOURIER SERIES
2019-2020 Onwards

Semester - I	INTEGRAL CALCULUS AND FOURIER SERIES	Hours/Week – 6	
CORE COURSE-II		Credits – 5	
Course Code – 19UMA1CC2		Internal 25	External 75

Objectives:

- To inculcate the basics of Integration and their applications.
- To introduce the order of Integration, Triple Integrals, Beta and Gamma functions.
- To understand the basic concepts of Fourier series.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply the concepts of double, triple integrals.	K3
CO2	Distinguish the concepts of Beta and Gamma functions.	K3
CO3	Apply the concepts of half range Fourier series for solving problems necessary for success in calculus.	K3
CO4	Associate various types of Fourier series for solving problems.	K4
CO5	Evaluate the types of integration.	K5

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	S	S	S	S
CO3	S	S	M	M	S
CO4	S	S	M	M	S
CO5	S	M	S	S	M

S - Strong, M - Medium, L - Low

CORE COURSE-II (CC)
INTEGRAL CALCULUS AND FOURIER SERIES
SYLLABUS

UNIT I

Integration: Integration of rational algebraic functions $\int \frac{lx+m}{ax^2+bx+c} dx$ - Integration of Irrational functions $\int \frac{px+q}{\sqrt{ax^2+bx+c}} dx$ - Any expression of the form $\int \frac{dx}{(x-k)\sqrt{ax^2+bx+c}}$ - $\int \frac{dx}{a+b\cos x}$ (Integration of these types only)

UNIT II

Multiple Integrals: Definition of the double integral - Evaluation of the double Integral- Triple Integrals.

UNIT III

Improper Integrals: Beta and Gamma functions: Definitions - convergence of $\Gamma(n)$ - Recurrence formula of gamma functions - Properties of Beta functions - Relation between Beta and Gamma functions -Definite integrals using Gamma functions.

UNIT IV

Fourier Series- Definition - Fourier Series expansion of periodic functions with period 2π - Even and Odd functions.

UNIT V

Half-Range Fourier Series - Definition - Development in cosine series and sine series – Change of Interval - Combination of Series.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S. Narayanan, T.K.Manicavachagam Pillai.	Calculus Vol II	S. Viswanathan (Printer & publishers), Pvt Ltd	2015
2.	S. Narayanan, T.K.Manicavachagam Pillai.	Calculus Vol III	S. Viswanathan (Printer & publishers), Pvt Ltd	2014

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	7	7.3 (Type II)[1]
	8	Case II and case V[1]
	9	Full [1]
II	5	2.1, 2.2 & 4 [1]
III	7	2.1-2.3, 3 to 5 [1]
IV	6	1, 2, 3 [2]
V	6	4, 5.1, 5.2, 6, 7 [2]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	Shanti Narayan	Integral Calculus	S.Chand & Company Ltd	2002
2.	Shanti Narayan & P.K.Mittal	Integral Calculus	S.Chand & Company Ltd	2008
3.	U.P.Singh, R.J.Srivastava & N.H.Siddiqui	Integral Calculus	Wistom Press	2011
4.	J.K.Goyal & K.P.Gupta	Laplace and Fourier Transforms	Pragati Prakashan	2009

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

FIRST ALLIED COURSE-I (AC)
MATHEMATICAL STATISTICS – I
2019-2020 Onwards

Semester – I	MATHEMATICAL STATISTICS – I	Hours/Week – 5	
FIRST ALLIED COURSE-I		Credits – 3	
Course Code – 19UMA1AC1		Internal 25	External 75

Objectives:

- To learn the basic concepts of statistics.
- To learn the basic ideas of statistical tools.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Describe the concept of probability theory and identify applications in real situations.	K2
CO2	Explain the derivation of moment generating function, characteristic function, probability generating function and the proof of Chebychev’s inequality with its applications.	K2
CO3	Compute the index numbers by different types of methods.	K3
CO4	Define and Classify the two dimensional random variables.	K3
CO5	Interpret the various properties of expectation, variance and The concept of covariance.	K3
CO6	Distinguish between a discrete and a continuous random variable.	K4

Mapping with Programme Outcomes:

COs/ POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	M	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S
CO6	S	S	S	S	S

S- Strong; M-Medium; L-Low

FIRST ALLIED COURSE-I (AC)
MATHEMATICAL STATISTICS – I
SYLLABUS

UNIT I

Theory of probability : Introduction – Short History – Definitions of Various Terms – Mathematical or Classical or ‘a Priori’ Probability – Statistical or Empirical Probability – Mathematical Tools: Preliminary Notion of sets – Sets and Elements of Sets – Operations on Sets – Algebra of Sets - Axiomatic approach to Probability – Random Experiment (Sample Space) – Event – Some Illustrations – Algebra of Events – Probability : Mathematical Notion – Probability Function – Laws of Addition of Probabilities – Extension of General Law of Addition of Probabilities – Law of Multiplication or Theorem of Compound Probability – Extension of Multiplication Law of Probability – Independent Events – Pair wise Independent Events – Mutually Independent Events – Baye’s theorem.

UNIT-II

Random Variables and Distribution Functions : Random Variable – Distribution Functions – Properties of Distribution Function – Discrete Random Variable – Probability Mass Function – Discrete Distribution Function – Continuous Random Variable – Probability Density Function – Various Measures of Central Tendency, Dispersion, Skewness and Kurtosis for Continuous Probability Distribution Function – Continuous Distribution Function – Joint Probability Mass Function and Marginal and Conditional Probability Function – Joint Probability Distribution Function – Joint Density Function, Marginal Density Function - Independent Random Variables – The Conditional Distribution Function and Conditional Probability Density Function.

UNIT-III

Mathematical Expectation – Addition Theorem of Expectation – Multiplication Theorem of Expectation – Co-variance – Expectation of a Linear Combination of Random Variables – Variance of a Linear Combination of Random Variables – Expectation of a Continuous random variable – Conditional Expectation and Conditional Variance.

UNIT-IV

Moment Generating Function – Theorems on moment Generating Functions–

Cumulants– Additive Property of Cumulants – Effect of Change of Origin and Scale of Cumulants – Characteristic Function – Properties of Characteristic Functions – Uniqueness Theorem of Characteristic Functions – Chebychev’s Inequality – Weak Law of Large Numbers– Bernoulli’s Law of Large Numbers.

UNIT-V

Index numbers : Introduction – Meaning – Definition – Characteristics – Uses – Types of Index Numbers – Problems in the Construction of Index Numbers – Choice of Formula – Notations – Unweighted Index Numbers – Weighted Index Numbers – Quantity Index Numbers – Test of Consistency of Index numbers – Chain Base Method – Conversion of Chain Index into Fixed Index – Base Shifting – Splicing two Index Number Series – Deflating Index Numbers – Consumer Price Index – Meaning and Need – Uses – Construction of Consumer Price Index – Method of Constructing Consumer Price Index numbers – Aggregate Expenditure method – Family Budget method – Limitations of Index Numbers.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S.C.Gupta & V.K.Kapoor	Elements Of Mathematical Statistics	Sultan Chand & Sons, New Delhi	2004
2.	R.S.N.Pillai & Bhagavathi	Statistics, Theory And Practice	S.Chand & Sons, New Delhi	2008

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	4	4.1 to 4.8 [1]
II	5	5.1 to 5.5.5 [1]
III	6	6.1 to 6.8 [1]
IV	6	6.9 to 6.13.1 [1]
V	14	Full [2]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	S.C.Gupta & V.K.Kapoor	Fundamentals Of Mathematical Statistics	Sultan Chand & Sons.	2015
2.	T.Veerarajan	Probability, Statistics And Random Processes	Tata McGraw Hill education Private Limited	2010
3.	G.S.S.Bhisma Rao	Probability And Statistics	Scitech Publications (India) Pvt. Ltd	2011

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

SEMESTER II
CORE COURSE-III (CC)
ANALYTICAL GEOMETRY AND VECTOR CALCULUS
2020-2021 Onwards

Semester – II	ANALYTICAL GEOMETRY AND VECTOR CALCULUS	Hours/Week – 6	
CORE COURSE-III		Credits – 5	
Course Code – 20UMA2CC3		Internal 25	External 75

Objectives:

- To understand the concepts and properties of analytical geometry.
- To understand the concepts of plane, straight line and sphere.
- To familiarize the students with the principles and practices of vector calculus.
- To familiarize the students with vector integration.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the coordinates in space, equation of a plane.	K3
CO2	Describe the concepts of straight lines and coplanar lines.	K3
CO3	Classify the equation of a sphere and tangent planes.	K3
CO4	Solve the problems of Gauss Divergence Theorem, Stokes Theorem- Green's Theorem.	K3
CO5	Examine the concepts of vector integration for finding scalar potential.	K4

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	S	S	S	S
CO3	S	S	M	M	S
CO4	S	S	M	M	M
CO5	S	S	S	S	M

S-Strong, M-Medium, L-Low

CORE COURSE-III (CC)
ANALYTICAL GEOMETRY AND VECTOR CALCULUS

SYLLABUS

UNIT I:

Coordinate System: Introduction-Rectangular Cartesian Coordinates-Distance between two Points-Direction Cosines.

Planes: Equation of a Plane – Angle Between two Planes – Angle Bisectors of two Planes.

UNIT II:

Straight Lines: Equation of a Straight Line – A Plane and a Line – Equations of Two Skew Lines in a Simple form.

The Sphere: Introduction – Equation of a Sphere – Tangent Line and Tangent Plane – Section of a Sphere.

UNIT III:

Vector Differentiation: Introduction – Vector Algebra- Differentiation of Vectors – Gradient - Divergence and Curl.

UNIT IV:

Vector Integration - Line integrals-Normal Surface Integral $\int_S \vec{F} \cdot \hat{n} dS$ -Flux across a Surface-Volume Integral $\int_V F \cdot dv$

UNIT V:

Gauss's Divergence Theorem $\int_S \vec{F} \cdot \hat{n} dS = \int_V \text{div } \vec{F} dv$ -Stoke's theorem $\int_C \vec{F} \cdot \hat{n} d\vec{r} = \int_S \text{curl } \vec{F} \cdot \hat{n} dS$ -Green's theorem-Stoke's theorem in space- Stoke's theorem in Cartesian form.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S. Arumugam and A. Thangapandi Isaac	Analytical Geometry 3D & Vector Calculus	New Gamma Publishing House, 2011	2011
2.	M.L.Khanna	Vector Calculus	Jai Prakash Nath and Co.,	2002

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	I	1.0 - 1.3 [1]
	II	2.1 - 2.3[1]
II	III	3.1 - 3.3 [1]
	IV	4.0 - 4.3 [1]
III	V	5.0 - 5.4 [1]
IV	III	1 – 4 [2]
V	III	5 – 8 [2]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	P.Duraipandiyan, Lakshmi Duraipandian and D.Muhilan	Analytical Geometry Three dimensional	Emerald Publishers	1984
2.	H.D.Pandey, M.Q.Khan and B.N.Gupta	A Text Book of Analytical Geometry and Vector Analysis	Wisdom Press	2011
3.	P.Duraipandiyan and Lakshmi Duraipandian	Vector Analysis	Emerald Publishers	1986

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

FIRST ALLIED COURSE – II (AP)
MATHEMATICAL STATISTICS – II (PRACTICAL)
2019-2020 Onwards

Semester – II	MATHEMATICAL STATISTICS – II (PRACTICAL)	Hours/Week – 5	
FIRST ALLIED COURSE-II		Credits – 3	
Course Code – 19UMA2AC1P		Internal 40	External 60

Objectives:

- To analyze the statistical problems.
- To provide the knowledge to interpret and solve the statistical problems.
- To ensure with the ideas of statistical tools.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify the discrete and continuous data and find average through the Measures of Central Tendency and Measures of Dispersion.	K1
CO2	Solve the problems in joint, Marginal and Conditional Probability distributions involving two random variables.	K2
CO3	Explain the various methods of finding Correlation and Regression co-efficient between two data sets and their applications.	K2
CO4	Describe and illustrate the concepts of fitting probability distributions.	K2
CO5	Analyze the concepts of testing of hypothesis and apply the test to the real life problems.	K3

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	S
CO2	M	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S-Strong, M-Medium, L-Low

FIRST ALLIED COURSE – II (AP)
MATHEMATICAL STATISTICS – II (PRACTICAL)
SYLLABUS

UNIT I

Measures of central tendency: Arithmetic Mean – Median – Quartiles – Deciles – Percentiles – Mode – Geometric Mean – Harmonic Mean – Measures of Dispersion: Range and Quartile Deviation – Mean Deviation – Standard Deviation – Co-efficient of variation – Skewness – Moments – Kurtosis.

UNIT II

Karl Pearson's Coefficient of Correlation – Rank correlation – Regression.

UNIT III

Theoretical Distributions: Binomial Distribution – Poisson Distribution – Normal Distribution.

UNIT IV

Two-dimensional Random Variables – Two-dimensional or Joint Probability Mass Function – Two-dimensional Distribution Function – Marginal Distribution Function – Joint Density Function, Marginal Density Function – The Conditional Distribution Function and Conditional Probability Density Function (Problems only).

UNIT V

Tests of Hypotheses: Test of Significance for Large Samples – Test of significance of the difference between sample proportion and population proportion – Test of significance of the difference between two sample proportions – Test of significance of the difference between sample mean and population mean – Test of significance of the difference between the mean two samples – Test of significance of the difference between sample S.D. and population S.D. – Test of significance of the difference between S.D.'s of two large samples – Test of Significance for small Samples : Tests of significance based on t-test for Mean – F-test for Variance - Chi-square test for goodness of fit and independence of attributes (Problems only).

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	R.S.N. Pillai and Bagavathi.	Practical Statistics	Sultan Chand & Sons.	2008
2.	S.C.Gupta & V.K.Kapoor	Fundamentals Of Mathematical Statistics	Sultan Chand & Sons.	2015
3.	T.Veerarajan	Probability, Statistics And Random Processes	Tata McGraw Hill education Private Limited	2010

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	3 , 4 , 5	FULL [1]
II	6 , 7	FULL [1]
III	13	FULL [1]
IV	5	5.5, 5.5.1-5.5.5 [2]
V	9	FULL [3]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	R.S.N.Pillai & Bhagavathi	Statistics, Theory And Practice	S.Chand & Sons	2008
2.	V.Rajagopalan	Selected Statistical Tools	New Age International (P) Ltd Publishers	2006
3.	G.S.S.Bhisma Rao	Probability and Statistics	Scitech Publications (India) Private Limited, New Delhi	2011

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

LIST OF PROGRAMS:

- 1) Arithmetic Mean, Geometric Mean and Harmonic Mean.
- 2) Median and Mode.
- 3) Quartile Deviation and Mean Deviation.
- 4) Standard Deviation and Co-efficient of Variation.
- 5) Karl Pearson's Co-efficient of Skewness.
- 6) Bowley's Co-efficient of Skewness.
- 7) Moments and Kurtosis.
- 8) Karl Pearson's Co-efficient of correlation.
- 9) Rank Correlation.
- 10) Fit a regression line.
- 11) Fit a Binomial distribution.
- 12) Fit a Poisson distribution.
- 13) Fit a Normal distribution.
- 14) Marginal and conditional distribution for X and Y.
- 15) Mathematical Expectation for X and Y.
- 16) Test the hypothesis of the difference between two sample means.
- 17) Test the hypothesis for single proportion.
- 18) Test the significance of hypothesis using 't' test.
- 19) Test the significance of hypothesis using 'F' test.
- 20) Test the significance of hypothesis using chi-square test.

FIRST ALLIED COURSE – III (AC)
MATHEMATICAL STATISTICS – III
2019-2020 Onwards

Semester – II	MATHEMATICAL STATISTICS – III	Hours/Week – 5	
FIRST ALLIED COURSE-III		Credits – 3	
Course Code – 19UMA2AC2		Internal 25	External 75

Objectives:

- To enable the students to learn the basic concepts of discrete distribution.
- To make the students analyze the concepts of continuous distribution.
- To ensure the students with the ideas of statistical tools.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Define the chi square Distribution and discuss the applications of chi square Distribution to conduct tests of goodness of fit and independence of attributes.	K2
CO2	Explain Student's t, Fisher's t and F statistics and derive their probability Distribution.	K2
CO3	Identify the concepts of a discrete probability Distribution and compute the moments, Cumulants, m.g.f and various constants of a discrete probability Distribution and its applications.	K3
CO4	Describe the concepts of a continuous probability Distribution and compute the moments, Cumulants, m.g.f and various constants of a continuous probability Distribution and its applications.	K3
CO5	Classify the various properties of the correlation and regression co- efficient and their applications.	K3

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	M	S	S
CO3	S	S	S	S	S
CO4	S	S	S	S	S
CO5	S	S	S	S	S

S-Strong, M-Medium, L-Low

FIRST ALLIED COURSE – III
MATHEMATICAL STATISTICS – III
SYLLABUS

UNIT I

Introduction – Discrete uniform Distribution – Bernoulli Distribution : Moments of Bernoulli Distribution - Binomial Distribution : Moments of Binomial Distribution – Recurrence Relation for the Moments of Binomial Distribution – Factorial Moments of Binomial Distribution – Mean Deviation about Mean of Binomial Distribution – Mode of Binomial Distribution – Moment Generating Function of Binomial Distribution – Additive Property of Binomial Distribution – Characteristic Function of Binomial Distribution – Cumulants of the Binomial Distribution – Poisson Distribution : The Poisson Process – Moments of the Poisson Distribution – Mode of the Poisson Distribution – Recurrence Relation for Moments of the Poisson Distribution – Moment Generating Function of the Poisson Distribution – Characteristic Function of the Poisson Distribution – Cumulants of the Poisson Distribution – Additive or Reproductive Property of Independent Poisson Variates – Probability Generating Function of Poisson Distribution.

UNIT II

Introduction – Normal Distribution : Normal Distribution as a Limiting Form of Binomial Distribution – Chief Characteristics of the Normal Distribution and Normal Probability curve – Mode of Normal Distribution – Median of Normal Distribution – M.G.F. of Normal Distribution – Cumulant Generating Function (c.g.f.) of Normal Distribution – Moments of Normal Distribution – A Linear Combination of Independent Normal Variates – Points of Inflexion of Normal Curves – Mean Deviation About the Mean for Normal Distribution – Area Property (Normal Probability Integral) – Error Function – Importance of Normal Distribution – Fitting of Normal Distribution – Rectangular (or Uniform) Distribution : Moments of Rectangular Distribution – M.G.F. of Rectangular Distribution – Characteristic Function of Rectangular Distribution – Mean Deviation (about mean) of Rectangular Distribution.

UNIT III

Gamma Distribution : M.G.F. of Gamma Distribution – Cumulants Generating Function of Gamma Distribution – Additive Property of Gamma Distribution – Beta Distributions of first kind : Constants of Beta Distributions of first kind – Beta Distributions of second kind : Constants of Beta Distributions of second kind – Exponential Distribution : Moment Generating Function of Exponential Distribution.

UNIT IV

Correlation : Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson’s Co-efficient of Correlation : Limits for Correlation Co-efficient – Assumptions Underlying Karl Pearson’s Correlation Co-efficient – Rank Correlation : Spearman’s Rank Correlation Co-efficient – Repeated Ranks – Repeated Ranks (continued) – Linear Regression : Introduction – Linear Regression : Regression Co-efficient - Properties of Regression Co-efficient – Angle between two lines of Regression – Standard Error of Estimate or Residual Variance – Correlation Co-efficient between Observed and Estimated Values.

UNIT V

Chi-Square Distribution : Introduction – Derivation of the Chi-Square Distribution –M.G.F. of Chi-Square Distribution : Cumulant Generating Function of χ^2 Distribution – Limiting Form of χ^2 Distribution for large degree of Freedom –Characteristic Function of χ^2 Distribution – Mode and Skewness of χ^2 Distribution – Additive Property of χ^2 Variates – Chi- Square Probability Curve – Students’ Distribution : Introduction – Derivation of the Students’ t Distribution – Fisher’s t – Distribution of Fisher’s t – Constants of t-distribution – Limiting Form of t Distribution – Graph of t Distribution – Critical Values of t – F- Distribution : Derivation of Snedecor’s F- Distribution – Constants of F- Distribution – Mode and Points of Inflexion of F- Distribution – Relation between t and F Distributions – Relation between F and χ^2 Distributions.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S.C.Gupta & V.K.Kapoor	Fundamentals Of Mathematical Statistics	Sultan Chand & Sons.	2015

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	8	8.1 to 8.5.9 (omit 8.4.10 to 8.4.12 and 8.5.10) [1]
II	9	9.1 to 9.3.4 (omit 9.2.15) [1]
III	9	9.5 to 9.8.1 [1]
IV	10 11	10.1 to 10.4.2 & 10.7, 10.7.1 to 10.7.3 [1] 11.1 to 11.2.5 [1]
V	15 16	15.1 to 15.3.6 [1] 16.1 to 16.2.7, 16.5, 16.5.1 to 16.5.3, 16.7, 16.8 [1]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	S.C.Gupta & V.K.Kapoor	Elements Of Mathematical Statistics	Sultan Chand & Sons	2004
2.	R.S.N.Pillai & Bhagavathi	Statistics, Theory And Practice	S.Chand & Sons	2008
3.	G.S.S.Bhishma Rao	Probability And Statistics	Scitech Publications (India) Pvt Ltd	2011

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

SEMESTER III

CORE COURSE-IV (CC)

DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS

2019-2020 Onwards

Semester – III	DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS	Hours/Week – 5	
CORE COURSE-IV		Credits – 5	
Course Code – 19UMA3CC4		Internal 25	External 75

Objectives:

- To give an in-depth knowledge of solving Ordinary differential equations including separable, homogeneous, exact, and linear.
- To acquire the knowledge of solving problems using partial differential equations.
- To know the concepts of Laplace transforms and the Inverse Laplace transforms with applications.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Define Laplace transform & its inverse.	K1
CO2	Illustrate the notion of order & degree of the ordinary differential equations.	K2
CO3	Rephrase the partial differential equations by eliminating constants and arbitrary functions.	K2
CO4	Apply the method of variation of parameters for finding the solutions of second order ordinary differential equations.	K3
CO5	Compute general, singular & particular integrals for standard forms.	K3
CO6	Solve the ordinary differential equations by Laplace Transforms and inverse Laplace transforms.	K3

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	M	M	M	S
CO3	S	S	S	S	M
CO4	S	S	S	S	M
CO5	S	S	S	S	M
CO6	S	S	S	S	M

S-Strong, M-Medium, L-Low

CORE COURSE-IV (CC)
DIFFERENTIAL EQUATIONS AND LAPLACE TRANSFORMS
SYLLABUS

UNIT – I:

Equations of the first order but of higher degree:

Equations solvable for dy/dx – Equations solvable for y – Equations solvable for x – Clairaut's form – Extended form of Clairaut's form – Exact differential equations – Conditions of integrability of $M dx + N dy = 0$ – Practical rule for solving an exact differential equation – Rules for finding integrating factors – simple problems.

UNIT –II:

Linear equations with constant coefficients:

Definition – The operator D – Complementary function of a linear equation with constant coefficients – Particular integral – General method of finding P.I. – Special methods for finding P.I. of the forms e^{ax} , $\cos ax$ or $\sin ax$, $e^{ax} V$, x^m – Linear equations with variable coefficients – Methods of finding particular integrals – Special method of evaluating the P.I. when X is of the form x^m – Method of Variation of Parameters (Omit third & higher order equations).

UNIT –III:

Partial differential equations of the first order:

Classification of Integrals – Derivation of partial differential equations – By elimination of constants – By elimination of an arbitrary function – Lagrange's method of solving the linear equation – Special methods for some standard forms $F(p, q) = 0$, $F(x, p, q) = 0$, $F(y, p, q) = 0$, $F(z, p, q) = 0$, $f_1(x, p) = f_2(y, q)$ – Clairant's form – Equations reducible to the standard forms – Charpit's method – Solving of few standard forms from Charpit's method.

UNIT – IV:

Partial differential equations of higher order:

Introduction – Homogeneous differential equation – Methods of finding C.F. – Methods of finding P.I. of the forms e^{ax+by} , $x^r y^s$, $\sin(ax + by)$ or $\cos(ax + by)$, $e^{ax+by} \phi(x, y)$, $\sin ax \sin by$ or $\cos ax \cos by$.

UNIT – V:

Laplace transforms & inverse laplace transforms:

Definition – Piecewise continuity – Sufficient conditions for the existence of the Laplace Transforms – Basic results – Laplace Transform of periodic functions – Some general

theorems & simple applications – Evaluation of certain integrals using Laplace Transform – The Inverse Laplace Transforms –Modification of results in Laplace Transform to get the inverse Laplace Transform – Use of Laplace Transforms in solving ODE with constant coefficients.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S.Narayanan & T.K.Manicavachagom Pillay	Differential Equations And Its Applications	S.Viswanathan Publishers Pvt. Ltd	2016
2.	Dr.S.Arumugam & Mr.A.Thangapandi Isaac	Differential Equations And Applications	New Gamma publishing House	2014

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	4	1-3 [1]
	2	6 [1]
II	5	1-5 [1]
	8	4 [1]
III	12	1-6 [1]
IV	5	1-2 [2]
V	9	1-8 [1]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	M.D.Raisinghania	Ordinary and Partial Differential Equations	S.Chand & Company	2008

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

CORE COURSE-V (CC)
CLASSICAL ALGEBRA AND THEORY OF EQUATIONS
2019-2020 Onwards

Semester - III	CLASSICAL ALGEBRA AND THEORY OF EQUATIONS	Hours/Week – 5	
CORE COURSE-V		Credits – 5	
Course Code – 19UMA3CC5		Internal 25	External 75

Objectives:

- To establish a sound knowledge on theory of equations.
- To inculcate the students in applicable algebra.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain relation between roots and co-efficients of Polynomial equations.	K2
CO2	Apply symmetric functions in solving equations and find sum of r^{th} power of roots.	K3
CO3	Compute transformation of equations and solve Reciprocal equations.	K3
CO4	Interpret the quotient and remainder, Find removal of terms and form an equation whose roots are any power.	K2
CO5	Describe transformation in general with Descarte's rule of signs.	K2
CO6	Classify inequalities in all manners.	K3
CO7	Explain theory of numbers with its applications.	K2

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	M	S	M
CO4	S	M	S	S	S
CO5	S	S	M	S	M
CO6	S	S	S	S	S
CO7	S	S	S	S	S

S-Strong, M-Medium, L-Low

CORE COURSE-V (CC)
CLASSICAL ALGEBRA AND THEORY OF EQUATIONS
SYLLABUS

UNIT I

Relation between the roots and coefficients of Equations – Symmetric function of the roots – Sum of the powers of the roots of an equation

UNIT II

Newton's theorem on the sum of the power of the roots-Transformations of Equations– Reciprocal equations – To increase or decrease the roots of a given equation by a given quantity.

UNIT III

Form of the quotient and remainder when a polynomial is divided by a binomial – Removal of terms – To form of an equation whose roots are any power of the roots of a given equation – Transformation in general – Descarte's rule of signs.

UNIT IV

Inequalities – Elementary principles – Geometric & Arithmetic means – Weirstrass inequalities – Cauchy inequality – Applications to Maxima & Minima.

UNIT v

Theory of Numbers – Prime & Composite numbers – divisors of a given number N – Euler's Function (N) and its value – Integral part of a real number – The highest Power of a prime P contained in $n!$ – Congruences – Fermat's, Wilson's & Lagrange's Theorems.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	T.K.Manickavasagam Pillai & others	Algebra, Volume I	S.V. publications	1985
2.	T.K.Manickavasagam Pillai & others	Algebra, Volume I	S.V. publications	1985

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	6	11-13 [1]
II	6	14-17 [1]
III	6	18-21 & 24[1]
IV	4	1-13 [2]
V	5	1-18 [2]

REFERENCE BOOKS:

S.No	Authors Name	Title of the book	Publishers Name	Year of Publication
1.	H.S.Hall & S.R.Knight	Higher Algebra	Prentice Hall of India, New Delhi	1948
2.	Barnard S & Child	Higher Algebra	J.M.Publication	1936

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

SECOND ALLIED COURSE-I (AC)
PYTHON PROGRAMMING
2021-2022 Onwards

Semester - III	PYTHON PROGRAMMING	Hours/Week – 4	
Second Allied Course-I		Credits – 3	
Course Code – 21UMA3AC3		Internal 25	External 75

Objectives:

- To understand the concepts of Python programming language.
- To provide basic idea on user defined functions of Python programming.
- To inculcate the uses of built in data types of Python programming on real time data.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand Python’s core data types, input and output statements	K2
CO2	Demonstrate different decision making statements	K2
CO3	Explain Loop control statements and functions	K2
CO4	Apply the List, Tuple and Dictionaries concepts	K3

Mapping With Programme Outcomes:

Cos/Pos	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	M	M	M	M	M
CO3	M	S	S	M	M
CO4	S	S	M	M	M

S – Strong; M – Medium; L – Low

SECOND ALLIED COURSE-I (AC)

PYTHON PROGRAMMING

SYLLABUS

UNIT - I:

Basics of Python Programming (12 HOURS)

Introduction- Python Character Set-Token-Python Core Data Type- The print () Function- Assigning value to a variable-Multiple Assignments- Writing Simple Programs in Python- The input() Function –Formatting Number and String

UNIT - II: Operators, Expressions and Decision Statements (12 HOURS)

Operators and Expressions:

Introduction- Operators and Expressions- Arithmetic Operators- Operator Precedence and Associatively-Bitwise Operator.

Decision Statements:

Introduction-Boolean Operators- Using Numbers with Boolean Operators- Using String with Boolean Operators- Boolean Expressions and Relational Operators-Decision Making Statements

UNIT - III: Loop Control Statements and Functions (12 HOURS)

Loop Control Statements:

Introduction-The while Loop-The range () function-The for Loop- Nested Loops-The break Statement- The continue Statement.

Functions:

Introduction-Syntax and Basics of a Function- Use of a Function- Parameters and Arguments in a Function-The return Statement- The Lambda Function

UNIT - IV: Strings and Lists (12 HOURS)

Strings:

Introduction- The Str Class- the basic inbuilt python functions for string- the index [] operator- Traversing string with for and while loop- Immutable strings- The string operators- String operations.

Lists:

Introduction-Creating Lists-Accessing the elements of the List – Python inbuilt functions for Lists-List operator-List methods

UNIT - V: Tuples, Sets, Dictionaries (12 HOURS)

Tuples, Sets and Dictionaries:

Introduction to Tuples-Sets-Dictionaries.

TEXT BOOK:

1. Ashok Namdev Kamthane and Amith Ashok Kamthane, “**Programming and Problem Solving with PYTHON**”, McGraw Hill Education (India) Private Limited. ©2018.

REFERENCE BOOKS:

1. Dr.R. Nageswara Rao Core Python Programming Dreamtech Press 2017.
2. Ch Satyanarayana, M Radhika Mani & B N Jagadesh, “Python Programming”, Universities Press, 2018.
3. Jeeva Jose and P. Sojan Lal, “Introduction to Computing and Problem Solving with Python”, Khanna Book Publisng Co. (P) Ltd., 2016.

WEB LINKS:

1. www.learnpython.org/
2. <https://www.codecademy.com/learn/python>
3. <https://www.Codementor.io>
4. <https://www.Python.org>

PEDAGOGY:

Power point Presentation, Assignments, Group Discussion and e-contents.

COURSE DESIGNER:

Mrs.K.Akila, Assistant Professor, Department of Computer Applications

SECOND ALLIED COURSE-II (AP)
PYTHON PROGRAMMING LAB
2021-2022 Onwards

Semester - III	PYTHON PROGRAMMING LAB	Hours/Week – 2	
Second Allied Course-II		Credits – 2	
Course Code – 21UMA3AC2P		Internal 40	External 60

OBJECTIVE:

- To know the basics of problem solving.
- To understand and write simple python programs.
- To develop python programs with decision making and conditional loops.
- To create user defined functions on python.

COURSE OUTCOME:

On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand and apply Python's basic concepts	K2
CO2	Demonstrate different data types and its usage	K2
CO3	Use the knowledge of functions	K3

MAPPING WITH PROGRAMME OUTCOMES:

Cos/Pos	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	M	M
CO2	M	M	M	M	M
CO3	S	S	S	M	M

S- Strong; **M-**Medium; **L-**Low

LIST OF PRACTICALS

1. Get inputs from user and display them
2. Develop a calculator

3. Implement Decision making and Loop control statements
4. Create and call an user defined function
5. Strings and their built-in functions
6. List and their built-in functions
7. Working with Tuples
8. Working with Dictionaries

WEB REFERENCES:

1. <https://www.programiz.com/python-programming>
2. <https://www.tutorialspoint.com/python>
3. <https://www.w3schools.com/python>

PEDAGOGY:

Power Point Presentation, Demonstration

NON-MAJOR ELECTIVE COURSE – I (NME)
MATHEMATICS FOR COMPETITIVE EXAMINATION-I
2019-2020 Onwards

Semester - III	MATHEMATICS FOR COMPETITIVE EXAMINATION-I	Hours/Week – 2	
NON-MAJOR ELECTIVE COURSE – I		Credits – 2	
Course Code – 19UMA3NME1		Internal 25	External 75

Objectives:

- To provide the knowledge to analyze, interpret and solve the Mathematical problems.
- To develop the thinking capacity to solve the problems.
- To study many short tricks to solve the mathematical problems easily.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Solve the Problems on Numbers and Problems on Ages.	K2
CO2	Explain the concept of time and distance, Calendar and Clock.	K2
CO3	Apply the concept of Data Interpretation in various types of Graphs.	K3
CO4	Distinguish the concept of Series Codes, Relationships, Analogy and Classification.	K3
CO5	Explain the concept of Logical Reasoning.	K3

Mapping With Programme Outcomes:

Cos/Pos	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	S	S	S	S
CO3	S	S	M	M	S
CO4	S	S	M	M	M
CO5	S	S	S	S	M

S – Strong; M – Medium; L – Low

NON-MAJOR ELECTIVE COURSE – I (NME)
MATHEMATICS FOR COMPETITIVE EXAMINATION-I

SYLLABUS

UNIT I

Problems on Numbers – Problems on Ages.

UNIT II

Time and Distance – Calendar – Clocks.

UNIT III

Data Interpretation: Tabulation – Bar Graphs – Pie Charts – Line Graphs.

UNIT IV

Reasoning (Including Mathematical): Series – Codes – Relationship – Analogy – Classification.

UNIT V

Logical Reasoning.

Text Books:

S. No	Authors	Title of the Book	Publishers/Edition	Year of Publication
1.	R. S. Aggarwal	Quantitative Aptitude – For Competitive Examinations (Fully Solved)	S.Chand & Company Pvt.Ltd,	Reprint 2015
2.	Dr. K.Kautilya	UGC NET/JRF/SET Teaching & Research Aptitude (General Paper - I)	UPKAR PRAKASHAN, AGRA – 2, Sixth Edition	2017

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	7, 8	161 – 194 [1]
II	17	384 – 404 [1]
	27,28	593 – 604 [1]
III	36,37,38,39	659 – 726 [1]
IV	5	132 – 161 [2]
V	6	162 – 190 [2]

REFERENCE BOOKS:

S. No	Authors	Title of the Book	Publishers/ Edition	Year of Publication
1.	Edgar Thorpe	Test of Reasoning for Competitive Examinations	Tata McGraw-Hill Publishing Company Limited, New Delhi, 2 nd Edition,	3 rd Re-Print 2000.
2	T.K. Sinha	80+ Practice Sets of Quantitative Aptitude for Bank PO Exams	Arihant Publication (India) limited	2002.

Pedagogy:

Chalk and Talk, PPT, Discussion and Quiz

SEMESTER IV
CORE COURSE VI – (CC)
SEQUENCES AND SERIES
2019-2020 Onwards

Semester - IV	SEQUENCES AND SERIES	Hours/Week – 6	
Core Course - VI		Credits – 5	
Course Code – 21UMA4CC6		Internal 25	External 75

Objectives:

- To lay a good foundation for classical analysis.
- To study the behavior of sequences and series.
- To acquire the knowledge of solving problems in Binomial, Logarithm & Exponential Series.

Course Outcomes:

On the Successful completion of the course, students will be able to

CO No.	CO Statement	Knowledge Level
CO1	Explain the concepts of convergent sequences, divergent sequences and series.	K2
CO2	Apply the ideas of sequences in Algebra of limits.	K3
CO3	Compute the behavior of monotonic functions.	K3
CO4	Apply the theory of Cauchy's condensation test and Cauchy's root test on series.	K3
CO5	Solve the problems based on binomial, logarithmic and exponential series.	K3
CO6	Examine infinite series using D' Alembert's ratio test.	K4

Mapping with Programme Outcome:

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	M	S
CO2	S	S	S	S	S
CO3	S	S	S	M	M
CO4	S	S	S	M	M
CO5	S	M	S	S	S
CO6	S	S	S	S	M

S-Strong, M-Medium, L-Low

CORE COURSE VI – (CC)
SEQUENCES AND SERIES
SYLLABUS

UNIT – I **(15 Hours)**

Introduction – Sequences – Bounded Sequences – Monotonic Sequences – Convergent Sequences – Divergent and Oscillating Sequences – The Algebra of Limits.

UNIT –II **(15 Hours)**

Behavior of Monotonic sequences – Some theorems on limits –Subsequences.

UNIT –III **(15 Hours)**

Infinite Series – Definition of Convergence, Divergence & Oscillate – Convergence of Geometric series – Some general theorems concerning infinite series – Series of positive terms – Comparison tests- convergence of $\sum \frac{1}{n^k}$ – D' Alembert's Ratio test.

UNIT – IV **(10 Hours)**

Cauchy's Condensation test – Cauchy's Root test and simple problems – Absolute Convergence – Conditional Convergence – Alternative Series.

UNIT – V **(20 Hours)**

Binomial theorem for a rational index – Some important particular case of the Binomial expansion – Sign of terms in binomial expansion – Numerically greatest term expansions – Method of splitting functions into partial fractions – Application of the Binomial theorem to the summation of series – Approximate values – Exponential limit – The Exponential theorem – Summation – The Logarithmic series – Modification of the logarithmic series – Summation of series– Euler's constant – Series which can be summed up by the logarithmic series – Calculation of logarithms by means of the logarithmic series.

TEXT BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	Dr.S.Arumugam & Prof.A.Thangapandi Isaac	Sequences and Series	New Gamma Publishing House	2015
2.	T.K.Manicavachagom Pillay, T.Natarajan & K.S.Ganapathy	Algebra, Volume I	S.Viswanathan Pvt Limited	2015

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	3	3.0-3.6 [1]
II	3	3.7-3.9 [1]
III	2	8-14, 16 [2]
IV	2	15, 17, 21-24 [2]
V	3	5-10, 14 [2]
	4	1-3, 5-10 [2]

REFERENCE BOOKS:

S.No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	M.K.Singal & Asha Rani Singal	A First Course in Real Analysis	R. Chand &co	2018
2.	N.P.Bali	Golden Maths series -Real Analysis	Laxmi Publication	2019

Web links:

1. https://youtu.be/JKiwztS6e_s
2. <https://youtu.be/A02NqndQan0>
3. <https://youtu.be/9sLsX9DV5Fs>
4. https://youtu.be/Q3_IGStTGvQ
5. <https://youtu.be/BvdVprh9NgQ>

Pedagogy:

Power point presentation, Group Discussion, Seminar, Assignment.

CORE COURSE – VII (CC)
METHODS IN NUMERICAL ANALYSIS
2021-2022 Onwards

Semester – IV	METHODS IN NUMERICAL ANALYSIS	Hours/Week –4	
Core Course – VII (CC)		Credits – 3	
Course Code – 21UMA4CC7		Internal 25	External 75

Objectives:

- To introduce the basic concepts of solving algebraic and transcendental equations.
- To introduce the numerical techniques of interpolation in various intervals.
- To understand the knowledge of numerical techniques of differentiation and integration.

Course Outcomes:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Apply numerical methods to solve Algebraic, Transcendental equations.	K2
CO2	Explain and solve the numerical techniques of interpolation in various intervals.	K2
CO3	Solve numerical integration and differentiation.	K3
CO4	Solve the system of linear equation with understanding by appropriate methods.	K3
CO5	Compute the numerical solution of ordinary differential equation by various methods.	K3

Mapping with Programme Outcomes:

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	M	M	S	S	S
CO4	M	M	S	S	S
CO5	S	S	S	S	S

S-Strong, M-Medium, L-Low

CORE COURSE – X (CC)
METHODS IN NUMERICAL ANALYSIS
SYLLABUS

UNIT I **(15 Hours)**

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:

Introduction – Method of False Position – Iteration Method – Newton-Raphson Method – Ramanujan’s Method – Secant Method – Muller’s Method.

UNIT II **(15 Hours)**

INTERPOLATION:

Introduction – Errors in Polynomial Interpolation – Finite Differences –Newton’s Formulae for Interpolation – Interpolation with Unevenly Spaced Points: Lagrange’s Interpolation Formula – Divided Differences and Their Properties: Newton’s General Interpolation Formula.

UNIT III **(15 Hours)**

NUMERICAL DIFFERENTIATION AND INTEGRATION:

Introduction – Numerical Differentiation – Numerical Integration: Trapezoidal Rule – Simpson’s 1/3 Rule – Simpson’s 3/8 Rule – Boole’s and Weddle’s Rules –Use of Cubic Splines – Romberg Integration – Newton-Cotes Integration Formulae.

UNIT IV **(15 Hours)**

NUMERICAL LINEAR ALGEBRA:

Introduction – Solution of Linear Systems – Direct Methods : Gauss Elimination – Necessity for pivoting – Gauss-Jordan Method – Modification of the Gauss Method to Compute the Inverse – Solution of Linear Systems – Iterative Methods.

UNIT V**(15 Hours)****NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS:**

Introduction – Solution by Taylor’s Series – Picard’s Method of Successive Approximations – Euler’s Method: Modified Euler’s Method, Runge - Kutta Methods – Predictor – Corrector Methods.

TEXT BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	S. S. Sastry	Introductory Methods of Numerical Analysis	Fifth Edition , PHI Learning Private Limited, Delhi	2018

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTION
I	2	2.1, 2.3 – 2.8
II	3	3.1 – 3.3, 3.6, 3.9 (3.9.1 Only) & 3.10 (3.10.1 Only)
III	6	6.1, 6.2 & 6.4
IV	7	7.1, 7.5 (7.5.1– 7.5.4) & 7.6
V	8	8.1–8.3, 8.4(8.4.2 Only), 8.5 & 8.6

REFERENCE BOOKS:

S.No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	M.K. Jain, S.R.K. Iyengar and R.K. Jain	Numerical Methods for Scientific and Engineering Computations	New Age International Private Limited	1999
2.	C.E. Froberg	Introduction to Numerical Analysis	II Edition , Addison Wesley	1979
3.	Dr. P. Kandasamy, Dr.K. Thiligavathy and Dr.K. Gunavathi	Numerical Methods	S. Chand & Company Pvt.	2013

Web links:

1. https://www.youtube.com/watch?v=3j0c_FhOt5U
2. <https://nptel.ac.in/courses/111/107/111107105/>
3. <https://www.youtube.com/watch?v=0rtaUUonwkU>
4. <https://nptel.ac.in/courses/111/107/111107106/>
5. <https://www.youtube.com/watch?v=QuggSa3G1-w>

Pedagogy:

Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

Second Allied Course III (AC)

Internet of Things

2021-2022 Onwards

Semester – IV	Internet of Things	Hours/Week – 4	
Second Allied Course - III		Credits – 3	
Course Code – 21UMA4AC4		Internal 25	External 75

Objectives

- To study fundamental concepts of IoT
- To understand roles of sensors and learn different protocols used for IoT
- To apply the concept of Internet of Things in the real-world scenario

Course Outcome

CO No.	CO Statement	Knowledge Level
CO1	Understand building blocks of Internet of Things and characteristics	K2
CO2	Analyze basic protocols in wireless sensor network	K4
CO3	Illustrate different sensor technologies for sensing real world entities and identify the applications	K3
CO4	Demonstrate the ability to transmit data wirelessly between different devices	K3
CO5	Design IoT applications in different domain and be able to analyze their performance	K5

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	S	S	S	S	M
CO3	S	S	S	S	S
CO4	S	S	S	M	S
CO5	S	S	S	S	S

S-Strong, M-Medium, L-Low

Second Allied Course III

Internet of Things

2021-2022 Onwards

Syllabus

Unit I :

Introduction to Internet of Things:

Introduction – Overview of Internet of Things (IoT) - Characteristics of IoT - IOT Applications, Working and Implementation of IoT - Components of an IoT System - IoT Architecture and Levels - IoT Ecosystem - Value chain and global value chain - Types of Networks – IoT Technologies and Protocols – Technologies used in IoT.

Unit II :

Communication Protocols – IOT Enabling Technologies – Building blocks of IoT – The logical and Physical design of IoT – Functional blocks of IoT – IoT design Methodology – Communication models – Development tools used in IoT – SDN and NFV for IoT

Unit III :

Things and Connections:

Introduction to control systems – Working of controlled systems – Feedback systems – Connectivity models – OSI Model – TCP/IP model – Types of modes – Wired and Wireless Methodology – Transmission media – Guided media – Unguided media – The process flow of IoT.

Unit IV :

Sensors, Actuators and Microcontrollers:

Introduction – Sensor – Classification of Sensors – Types of Sensors – Criteria to choose a Sensor – Actuators – Classification of Actuators – Microcontroller – Classification of Microcontrollers – Components of Microcontroller – Types of Microcontrollers – Application of Microcontroller – Embedded System – Real time Embedded system – Microprocessor – Evolution of Microprocessor – Major parts of Microprocessor – Characteristics of Microprocessor – Classification of Microprocessors – CISC – RISC – EPIC – Architecture of Microprocessor – Microprocessor vs Microcontroller.

Unit V:

Building IoT Applications :

Introduction to Arduino – Types of Arduino Boards – Introduction to Arduino IDE – Parts of Arduino IDE – Development Cycle – Writing/Editing Code in Sketch – Compiling –

Debugging – Uploading and Running a File – Role of Serial Monitor – Role of Serial Plotter –
LED Programming – Open Your First Sketch.

Text Books:

S.NO.	AUTHORS	TITLE	PUBLISHERS
1	Prof. Satish Jain & Shashi Singh	IoT and its Applications	BPB Publications

Chapters and Sections:

UNIT	CHAPTER	SECTIONS
I	1	1.1 – 1.12
I	1	1.13 – 1.21
II	2	2.1 – 2.12
III	3	3.1 – 3.24
IV	4	4.1 – 4.12

Reference Book:

S.NO.	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1	Arshdeep Bahga and Vijay Madiseti	Internet of Things A Hands-on Approach	Universities Press	2014
2	Raj Kamal	Internet of Things Architecture and Design Principles	Mc Graw Hill Education (India) Private Limited	2017
3	Preston Gralla	How the Internet Works	Pearson Education	2012

Web links

1. <https://iotbyhvm.ooo/physical-design-of-iot/>
2. <https://www.javatpoint.com/iot-internet-of-things>
3. <https://www.oracle.com/in/internet-of-things/what-is-iot/>
4. <https://www.edureka.co/blog/iot-applications/>
5. <https://www.rfpage.com/applications-of-internet-of-things-iot/>

Pedagogy

Power point presentation, Seminar and Quiz

SKILL BASED ELECTIVE – I (A)**INTRODUCTION TO R****2021-2022 Onwards**

Semester – IV	INTRODUCTION TO R	Hours/Week – 2	
Skill Based Elective –I(A)		Credits – 2	
Course Code – 21UMA4SBE1A		Internal 25	External 75

Objectives:

- To explore and understand how to use the R documentation.
- To master the use of the R and R Studio interactive environment.
- To understand how to create and manipulate data's in R.

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Navigate in the R Studio interface.	K2
CO2	Explain concepts of matrices and arrays.	K3
CO3	Discuss about List and data frames.	K3
CO4	Apply R effectively to analyze and visualize data.	K3
CO5	Classify various testing of hypothesis.	K2

Mapping with Programme Outcomes:

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	M	S	S	M
CO3	S	S	S	S	S
CO4	S	M	S	S	M
CO5	S	S	S	S	S

S-Strong, M-Medium, L-Low

SKILL BASED ELECTIVE – I (A)
INTRODUCTION TO R
SYLLABUS

UNIT I **(6 Hours)**

Getting Started:

Obtaining and Installing R from CRAN – Opening R for the First Time – Saving Work and Exiting R – Conventions.

Numerics, Arithmetic, Assignment and Vectors:

R for Basic Math – Assigning Objects – Vectors.

UNIT II **(6 Hours)**

Matrices and Arrays:

Defining a Matrix – Subsetting – Matrix Operations and Algebra – Multidimensional Arrays.

Non-Numeric Values:

Logical Values – Characters.

UNIT III **(6 Hours)**

Lists and Data Frames:

Lists of Objects – Data Frames.

Special Values, Classes and Coercion:

Some Special Values – Understanding Types, Classes and Coercion.

UNIT IV **(6 Hours)**

Elementary Statistics:

Describing Raw Data – Summary Statistics.

Basic Data Visualization:

Barplots and Pie Charts – Histograms – Box-and-Whisker Plots – Scatter Plots.

UNIT V **(6 Hours)**

Common Probability distributions:

Common Probability Mass Functions – Common Probability Density Functions.

Hypothesis Testing:

Components of a Hypothesis Test – Testing Means – Testing Proportions – Testing Categorical Variables – Errors and Power.

TEXT BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	Tilman M. Davies	The Book of R A First Course in Programming and Statistics	No Starch Press Inc.,	2016

CHAPTERS AND SECTIONS:

UNIT	CHAPTER	SECTIONS
I	1	1.1 -1.4
	2	2.1 -2.3
II	3	3.1 - 3.4
	4	4.1 - 4.2
III	5	5.1 & 5.2
	6	6.1 & 6.2
IV	13	13.1 & 13.2
	14	14.1 – 14.4
V	16	16.1 & 16.2
	18	18.1 – 18.5

REFERENCE BOOKS:

S.No	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	Dr. Mark Gardener	Beginning R The Statistical Programming Language	John Wiley & Sons, Inc	2012
2	Joseph Schmuller	Statistical Analysis R for Dummies	John Wiley & Sons, Inc	2017
3	Andy Field Jeremy miles Zoe Field	Discovering Statistics Using R	Sage Publications Ltd	2012

Web links:

1. <https://youtu.be/V8eKsto3Ug>
2. <https://youtu.be/RwDV802ckU8>
3. <https://youtu.be/fDRa82lxzaU>
4. <https://youtu.be/IL0s1coNtRk>
5. <https://youtu.be/SJpd7KC18fQ?list=PLJ5C6qdAvBffF7qtFi8PvRK8x55jsUQ>

Pedagogy:

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

SKILL BASED ELECTIVE- I (B)
INTRODUCTION TO STATISTICAL TOOLS AND TECHNIQUES - SPSS
2021-2022 Onwards

Semester – IV	INTRODUCTION TO STATISTICAL TOOLS AND TECHNIQUES - SPSS	Hours/Week – 2	
Skill Based Elective- I (B)		Credits – 2	
Course Code – 21UMA4SBE1B		Internal 25	External 75

Objectives:

- To learn basic data analysis and interpretation with SPSS.
- To manipulate and transform variables in SPSS.
- To establish a sound knowledge on SPSS.

Course Outcome:

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the objectives of SPSS.	K2
CO2	Apply SPSS for data interpretation.	K3
CO3	Compute various test using SPSS.	K3
CO4	Interpretation of several graphs in SPSS.	K2
CO5	Classify Data View, Variable View and Output View Screens.	K2

Mapping With Programme Outcomes:

COS/POS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	M	S	M
CO4	S	M	S	S	S
CO5	S	S	M	S	M

S – Strong , M – Medium, L– Low

SKILL BASED ELECTIVE- I (B) **INTRODUCTION TO STATISTICAL TOOLS AND TECHNIQUES - SPSS** **SYLLABUS**

UNIT I

(6 hours)

First Encounters:

Introduction and objectives- Entering, Analyzing and Graphing Data

Navigating in SPSS:

SPSS variable View screen-SPSS data view screen-SPSS Main menu- Data Editor
Toolbar – Short tour of variable View screen.

UNIT II

(6 hours)

Getting Data In and Out of SPSS:

typing data using the computer keyboard- Saving your SPSS Data and Output files- Opening your saved SPSS files – opening SPSS sample files- Copying and pasting data to other applications-Importing files from other applications- Exporting SPSS files to other applications.

Levels of Measurement:

Variable view screen: Measure column -Variables measured at the Nominal level- Variables measured at the Ordinal level- Variables measured at the Scale level.

UNIT III

(6 hours)

Entering Variables and Data and Validating Data:

Entering Variables and assigning attributes (Properties)-Entering Data for each variable – Validating Data.

Working with Data and Variables:

Computing a new variable - Recoding Scale Data into a String Variable- Inserting new variables and Cases in to Existing Databases- Data View page: Copy, Cut and Paste procedures.

UNIT IV

(6 hours)

Using the SPSS Help Menu:

Help Options – Using Help Topics – Using Help Tutorial – Using Help Case Studies – Getting Help When Using Analyze on the Main Menu.

Creating Basic Graphs and Charts:

Using Legacy Dialogs to Create a Histogram – Using Chart Builder to Create a Histogram – Using Legacy Dialogs to Create a Bar Graph – Using Chart Builder to Create a Bar Graph - Using Legacy Dialogs to Create a line Graph - Using Chart Builder to Create a line Graph - Using Legacy Dialogs to Create a Pie Chart - Using Chart Builder to Create a Pie Chart.

UNIT V

(6 hours)

Editing and Embellishing Graphs:

Creating a Basic Graph – Editing a Basic Graph – Editing a Three-Dimensional Graph – Exporting Graphs to Documents.

Printing Data View, Variable View and Output Viewers Screens:

Printing Data From the Variable View Screen – Printing Variable Information From and Output Viewer – Printing Tables From and Output Viewer.

TEXT BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	James B. Cunningham & James O. Aldrich	An Interactive Hands-on Approach	SAGE Publications India Pvt Ltd, New Delhi	2012

CHAPTERS AND SECTIONS:

UNIT	CHAPTERS	SECTIONS
I	1 & 2	1.1-1.2, 2.1-2.6
II	3 & 4	3.1-3.8, 4.1-4.5
III	5 & 6	5.1-5.4, 6.1-6.5
IV	7 & 8	7.1- 7.6, 8.1-8.9
V	9 & 10	9.1-9.5 10.1-10.4

REFERENCE BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	Keith McCormick & Jesus Salcedo with Aaron Poh	SPSS Statistics for Dummies	Wiley India Pvt Ltd, New Delhi, 3 rd Edition.	2015
2.	Robert H. Carver & Jane Gradwohl Nash	Doing Data Analysis	Thompson Brooks/Cole	2013
3.	Dr. S .L. Gupta & Hitesh Gupta	SPSS17.0 for Researchers	International Book House Pvt. Ltd- 2 nd Edition.	2014

Web links:

1. <https://youtu.be/Bku1p481z80>
2. <https://www.youtube.com/watch?v=zFBUfZEBWQ>
3. <https://youtu.be/DmS63ivVjis>
4. <https://youtu.be/i8lmUkB4lag>

Pedagogy:

Power point presentation, Group Discussion, Seminar, Assignment.

NON-MAJOR ELECTIVE (NME)– II
MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II
2019-2020 Onwards

Semester - IV	MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II	Hours/Week – 2	
Non-Major Elective-II		Credits – 2	
Course Code – 19UMA4NME2		Internal 25	External 75

Objectives:

- To provide the knowledge to analyze, interpret and solve the Mathematical problems.
- To develop the thinking capacity to solve the problems.
- To study many short tricks to solve the mathematical problems easily

Course Outcomes:

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Solve decimal fractions and simplification.	K2
CO2	Explain the concept of square roots, cube roots, Average, profit and loss	K2
CO3	Apply the concept of Ratio & Proportion and Problems on Trains.	K3
CO4	Distinguish the concept of Simple Interest and Compound Interest.	K3
CO5	Apply the concept of Permutations & Combinations, Odd Man Out & Series.	K3

Mapping with Programme Outcomes:

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	S	S
CO2	M	S	S	S	S
CO3	S	S	M	M	S
CO4	S	S	M	M	M
CO5	S	S	S	S	M

S - Strong, M - Medium, L - Low

NON-MAJOR ELECTIVE – II (NME)
MATHEMATICS FOR COMPETITIVE EXAMINATIONS - II
SYLLABUS

UNIT I (6 Hours)

Decimal Fractions – Simplification

UNIT II (6 Hours)

Square Roots & Cube Roots - Average - Profit & Loss

UNIT III (6 Hours)

Ratio & Proportion - Problems on Trains

UNIT IV (6 Hours)

Simple Interest - Compound Interest

UNIT V (6 Hours)

Permutations & Combinations – Odd Man Out & Series

TEXT BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	R.S.Aggarwal	Quantitative Aptitude	S. Chand & Company Ltd,	2007

CHAPTERS AND SECTIONS:

Unit	Chapter	Pages
I	3 & 4	46 – 116
II	5, 6 & 11	117 - 160 and 251 - 293
III	12 & 18	294 – 310 and 405 - 424
IV	21 & 22	445 – 486
V	30 & 35	613 – 620 and 649 - 657

REFERENCE BOOKS:

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1.	T.K.Sinha	80+ Practice Sets of Quantitative Aptitude for Bank PO Exams	Arihant Publication (India) limited	2002
2.	Abhijit Guha	Quantitative Aptitude for Competitive Examinations	McGraw-Hill Publishing Company Limited, New Delhi, 5 th Edition	2014

Web links:

1. <https://youtu.be/8BeJUzLqOTE>
2. <https://youtu.be/pShzc9AQMos>
3. <https://youtu.be/JP5J-rzoATg>
4. <https://youtu.be/ZnpEoROH1Vc>
5. <https://youtu.be/VIsyYMEAage>

Pedagogy:

Group Discussion, Seminar, Assignment.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MATHEMATICS



M. Sc. MATHEMATICS

AUTONOMOUS SYLLABUS

2022 – 2023 and onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc MATHEMATICS

PO NO.	On completion of M.Sc Mathematics, the students will be able to
PO 1	Problem Analysis Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO 2	Scientific Skills Create and apply advanced techniques and tools to solve the societal environmental issues.
PO 3	Environment and Sustainability Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO 4	Ethics Imbibe ethical and social values aiming towards holistic development of learners.
PO 5	Life long learning Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc MATHEMATICS

PSO NO.	The Students of M.Sc Mathematics will be able to	POs Addressed
PSO1	Make a significant contribution to society's development through mathematical study	PO1 PO2 PO3
PSO2	Provide an in-depth and extensive functional understanding of mathematical basics.	PO1
PSO3	Develop the experimental abilities in order to solve scientific and technical problems.	PO1 PO5
PSO4	Promote the learners and explore the potential in emerging fields.	PO4 PO5
PSO5	Enhance problem-solving, thinking, and creative skills through assignments and project work.	PO4 PO5



Cauvery College for Women (Autonomous), Trichy-18
PG & Research Department of Mathematics
M.Sc Mathematics

Learning Outcome Based Curriculum Framework (CBCS-LOCF)
For the Candidates admitted from the Academic year 2022-2023 onwards

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Algebra-I	22PMA1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Ordinary Differential Equations	22PMA1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Integral Equations, Calculus of Variations and Transforms	22PMA1CC3	6	5	3	25	75	100
	Core Course - IV (CC)	Algebraic Number Theory	22PMA1CC4	6	5	3	25	75	100
	Discipline Specific Elective Course-I (DSE)	A. Advanced Numerical Analysis	22PMA1DSE1A	6	3	3	25	75	100
		B. Mathematical Modelling	22PMA1DSE1B						
		C. Boundary Value Problems	22PMA1DSE1C						
Total				30	23	-	-	-	500

15 Days INTERNSHIP during Semester Holidays

II	Core Course– V (CC)	Algebra-II	22PMA2CC5	6	5	3	25	75	100
	Core Course – VI (CC)	Real Analysis	22PMA2CC6	6	5	3	25	75	100
	Core Course -VII (CC)	Linear Algebra	22PMA2CC7	6	5	3	25	75	100
	Core Choice Course– I (CCC)	Partial Differential Equations	22PMA2CCC1A	6	4	3	25	75	100
		Mathematical Programming	22PMA2CCC1B						
		Difference Equations	22PMA2CCC1C						
	Discipline Specific Elective Course-II (DSE)	A. Computational Mathematics Using MATLAB (P)	22PMA2DSE2AP	6	3	3	40	60	100
		B. Mathematical Modelling Using MATLAB (P)	22PMA2DSE2BP						
		C. Ordinary Differential Equations and Partial Differential Equations Using MATLAB (P)	22PMA2DSE2CP						
	Internship	Internship	22PMA2INT	-	2	-	-	100	100
Extra Credit Course	SWAYAM	As per UGC's Recommendation							
Total				30	24	-	-	-	600

III	Core Course– VIII(CC)	Topology	22PMA3CC8	6	5	3	25	75	100
	Core Course – IX (CC)	Discrete Mathematics	22PMA3CC9	6	5	3	25	75	100
	Core Course - X (CC)	Graph Theory	22PMA3CC10	6	5	3	25	75	100
	Core Choice Course– II (CCC)	Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		Measure and Integration	22PMA3CCC2B						
		Mechanics	22PMA3CCC2C						
	Discipline Specific Elective Course-III (DSE)	A. Analytical Skills for Competitive Examinations	22PMA3DSE3A	4	3	3	-	100	100
		B. Stochastic Processes	22PMA3DSE3B			3	25	75	
		C. Fuzzy Sets and their Applications	22PMA3DSE3C						
Generic Elective Course -I (GEC)	Foundation for Logical Thinking	22PMA3GEC1	3	2	3	25	75	100	
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600

IV	Core Course–XI(CC)	Complex Analysis	22PMA4CC11	6	5	3	25	75	100
	Core Course - XII(CC)	Functional Analysis	22PMA4CC12	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Differential Geometry	22PMA4CCC3A	6	4	3	25	75	100
		B. Formal Language and Automata Theory	22PMA4CCC3B						
		C. Functional Analysis	22PMA4CCC3C						
	Generic Elective Course-II (GEC)	Optimization Techniques	22PMA4GEC2	3	2	3	25	75	100
Project	Project Work	22PMA4PW	9	5	-	-	100	100	
Total				30	21	-	-	-	500
Grand Total				120	92	-	-	-	2200

Courses & Credits for PG and Research Department of Mathematics

S. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course– (CC)	12	60	1200
2.	Core Choice Course– (CCC)	3	12	300
3.	Discipline Specific Elective- (DSE)	3	9	300
4.	Generic Elective Course - (GEC)	2	4	200
5.	Project	1	5	100
6.	Internship	1	2	100
	Total	22	92	2200

Students will go for internship after completing the I Semester exams and the internship will be calculated in the II Semester and credits for internship is 02.

For each semester marks will be for 500(600 for II Semester due to internship)

The internal and external marks for theory and practical papers are as follows:

Subject	Internal	External
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks).
- The passing minimum for End Semester Examination shall be 40% out of 75 marks (i.e. 30 marks).
- The passing minimum not less than 50% in the aggregate.

For Practical:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)
- The passing minimum not less than 50% in the aggregate.

For Project:

Project : 100 Marks
 Dissertation : 80 Marks
 Viva Voce : 20 Marks

Semester I	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSETITLE	CATEGORY	Hrs / WEEK	CREDITS
22PMA1CC1	ALGEBRA- I	CORE	6	5

Course Objective

- **Gain** expertise and confidence in proving theorems to progress in mathematical studies.
- **Acknowledge** the students with experience in axiomatic mathematics while keeping in close touch with the computational aspects of the subject.
- **Enhance** students to understand principles, concepts necessary to formulate, solve and analyze Algebra.

Prerequisite:

- Basic knowledge of sets, relations and functions.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Apply the basic concepts of group theory with the help of numerous examples	K3
CO2	Examine in detail about Permutation Groups and Normal Groups and discuss about counting tricks in algebra	K4
CO3	Solve problems related to theorems	K3
CO4	Classify groups of finite order using Sylow's theorems	K4
CO5	Analyze the Field of Quotients of an integral domain	K4

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	2	2	2	3
CO2	2	3	3	2	2	2	3	2	2	3
CO3	2	2	3	3	3	3	3	2	3	3
CO4	3	3	2	2	3	3	3	3	2	2
CO5	2	2	3	3	2	3	2	2	2	3

Syllabus

Unit I

(17 Hours)

Binary Operations – Groups – Subgroups - Permutations I - Permutations II.

Unit II

(18 Hours)

Isomorphism - Direct products - Finitely Generated Abelian Groups - Groups of Cosets- Normal Subgroups and Factor Groups.

Unit III

(17 Hours)

Series of Groups - Isomorphism Theorems; Proof of the Jordan - Holder Theorem - Sylow Theorems.

Unit IV

(20 Hours)

Rings - Integral domains - The Field of Quotients of an Integral Domain - Quotient Rings and Ideals.

Unit V

(18 Hours)

Factorization of Polynomials over a Field - Unique Factorization Domains -Euclidean Domains -Gaussian Integers and Norms.

Unit VI- Self-Study for Enrichment (Not included for End Semester Examinations)

Cyclic Groups – Homomorphisms - Applications of the Sylow Theorem - Some Noncommutative examples - Homomorphism of Rings.

Text Book

1. John B. Fraleigh,(2018(Reprint)), *A First Course in Abstract Algebra*, Narosa Publishing House, Third edition.

Chapters and Sections

UNIT-I	Chapters 1 to 5[1]
UNIT-II	Chapters 7,8,9,11 and 12[1]
UNIT-III	Chapter 14,15 and 18[1]
UNIT-IV	Chapter 23,24,26 and 28[1]
UNIT-V	Chapter 31 to 34[1]

Reference Books

1. David S. Dummit and Richard M. Foote, (2004), *Abstract Algebra*, Wiley and Sons, Third Edition.
2. Joseph A. Gallian, (1999), *Contemporary Abstract Algebra*, Narosa Publishing House, Fourth Edition.
3. Herstein. I.N, (1975), *Topics in Algebra*, John Wiley, Second Edition.

Web References

1. https://www.youtube.com/watch?v=g7L_r6zw4-c
2. <https://www.youtube.com/watch?v=VSB8jjsn9xI>
3. <https://www.youtube.com/watch?v=WwndchnEDS4>
4. <https://www.youtube.com/watch?v=xTCxmr4ISU4>
5. <https://www.youtube.com/watch?v=iobTKR4-19o>
6. <https://www.youtube.com/watch?v=NfmJQ1ah4vM>
7. <https://www.youtube.com/watch?v=vrFd-5uEv4k>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. K. Kalaiarasi.

Semester I	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSETITLE	CATEGORY	Hrs / Week	CREDITS
22PMA1CC2	ORDINARY DIFFERENTIAL EQUATIONS	CORE	6	5

Course Objective

- **Recognize** certain basic types of first order ODEs for which exact solutions may be obtained and to apply the corresponding methods of solution
- **Qualitative Analysis** of Solutions of First Order Autonomous Equations.
- **Analyze** the concepts of existence and uniqueness of solutions.

Prerequisite

- Fundamental knowledge of ordinary differential equations in UG.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On successful completion of this work, students will be able to	
CO1	Define linear, non-linear, homogeneous and autonomous system of ordinary differential equations.	K1
CO2	Understand the Qualitative properties of solutions by Sturm separation and Sturm comparison theorems.	K2
CO3	Diagnose the power series solution for ordinary differential equations such as Gauss Hyper Geometric, Bessel's and Legendre equations.	K4
CO4	Discriminate the Qualitative properties of solutions for Boundary value problems by using Sturm theorems.	K4
CO5	Analyze the Stability nature of Linear and Non-Linear system for various methods.	K4

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	2	3	3	3	3	3	2	3
CO5	3	3	3	3	3	3	3	3	2	3

Syllabus

UNIT I

(18 Hours)

The General Solution of the Homogeneous Equation – The Use of a Known Solution to Find Another – The Method of Variation of Parameters – Power Series Solutions and Special Functions: Introduction: A Review of Power Series – Series Solutions of First Order Equations – Second Order Linear Equations. Ordinary Points.

UNIT II

(18 Hours)

Regular Singular Points – Gauss's Hypergeometric Equation – The Point at Infinity. Legendre Polynomials – Properties of Legendre Polynomials - Bessel Functions. The Gamma Function, Properties of Bessel Functions.

UNIT III

(18 Hours)

Linear Systems – Homogeneous Linear Systems with Constant Coefficients – The Existence and Uniqueness of Solutions: The Method of Successive Approximations - Picard's Theorem.

UNIT IV

(18 Hours)

Qualitative Properties of Solutions: Oscillations and the Sturm Separation Theorem – The Sturm Comparison Theorem – Eigen Values , Eigen Functions and the Vibrating String.

UNIT V

(18 Hours)

Nonlinear Equations: Autonomous Systems. The Phase Plane and Its Phenomena – Types of Critical Points. Stability – Critical Points and Stability for Linear Systems – Stability by Liapunov's Direct Method - Simple Critical Points of Nonlinear Systems.

UNIT VI - Self- Study for Enrichment(Not included for End Semester Examinations)

The Homogeneous Equation with Constant Coefficients - Regular Singular Points (Continued) – Systems. The Second Order Linear Equation - Sturm Liouville Problems - Nonlinear Mechanics, Conservative systems.

Text Book

1. George F. Simmons (2003). Differential Equations with Applications and Historical Notes, Second Edition. Tata McGraw- Hill Editions.

Chapters and Sections

UNIT – I	Chapter 3	Sections 15, 16, 19
	Chapter 5	Sections 26 to 28
UNIT – II	Chapter 5	Sections 29, 31, 32
	Chapter 8	Sections 44 to 47
UNIT – III	Chapter 10	Sections 55, 56
	Chapter 13	Sections 68, 69
UNIT – IV	Chapter 4	Sections 24, 25
	Chapter 7	Sections 40
UNIT –V	Chapter 11	Sections 58 to 62

Reference Books

1. Raisinghania M.D. (2006), Ordinary and Partial Differential Equations,1st Edition, S.Chand & Co.
2. Coddington E.A. and Levinson N. (2002), Theory of Ordinary Differential Equations, McGraw Hill Publishing Company, NewYork.
3. Chicone, Carmen. (2006), A Ordinary Differential Equations With Applications,2nd Edition, Spring Verlag, NewYork.

Web References

1. <https://www.youtube.com/watch?v=gd1FYn86P0c>
2. <https://www.youtube.com/watch?v=6o7b9yyhH7k>
3. <https://www.youtube.com/watch?v=HAb9JbBD2ig>
4. <https://www.youtube.com/watch?v=kj-qTWhH5N4>
5. <https://www.youtube.com/watch?v=CV81OjuHUS8>
6. <https://www.youtube.com/watch?v=oTN7hGoSPMw>
7. https://www.youtube.com/watch?v=IWm6Coa3_bQ
8. <https://www.youtube.com/watch?v=1HUnrokDN0U>
9. <https://www.youtube.com/watch?v=1HUnrokDN0U>

Pedagogy

Chalk and Talk method, Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. G. JANAKI

Semester I	Internal Marks: 25		External Marks: 75	
COURSECODE	COURSETITLE	CATEGORY	Hrs / Week	CREDITS
22PMA1CC3	INTEGRAL EQUATIONS, CALCULUS OF VARIATIONS AND TRANSFORMS	CORE	6	5

Course Objective

- To introduce the concept of calculus of variations and integral equations and their applications.
- To learn the different types of transforms and their properties.
- To give an experience in the implementation of Mathematical concepts like integral transforms, integral equations and calculus of variations in various field of Engineering.

Prerequisite

- Basic Knowledge of Integral Calculus and Fourier Series

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Apply the concepts of calculus of variations to find the maxima and minima of quantities defined as integrals containing unknown functions.	K3
CO2	Classify various kinds of Fourier sine and cosine transforms with their properties and simple problems.	K3
CO3	Explain the concept of Fourier transform, Hankel transform and its inverse transform.	K3
CO4	Recognize and solve particular cases of Fredholm and Volterra integral equations and variational problem	K4
CO5	Evaluate the integral equations by the method of successive approximations.	K5

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	2	2	2	3
CO2	2	3	3	2	2	2	3	2	2	3
CO3	2	2	3	3	3	3	3	2	2	3
CO4	3	3	2	2	3	3	3	2	2	2
CO5	2	2	3	3	2	3	2	2	2	3

Syllabus

UNIT I

(18 Hours)

Calculus of variations and applications: Maxima and Minima – The simplest case – Illustrative examples - Natural boundary conditions and transition conditions – The Variational notation – The More general case – constraints and Lagrange multipliers – variable end points – Sturm-Liouville problems.

UNIT – II

(18 Hours)

Fourier transforms: Dirichlet's conditions – Fourier series – Fourier's Integral formula – Fourier transform or complex Fourier transform – Inversion theorem for complex Fourier transform – Fourier sine transform - Inversion formula for Fourier sine transform - Fourier cosine transform - Inversion formula for Fourier cosine transform – Linearity property of Fourier transform – Change of scale property – Shifting Property – Modulation Theorem – Multiple Fourier transforms - Convolution - The convolution or Faltung theorem for Fourier transforms - Parseval's identity for transforms – Relationship between Fourier and Laplace transforms – Fourier transform of the derivatives of a function – Problems related to integral equations.

UNIT III

(18 Hours)

Hankel Transforms :Definition – Inverse formula for the Hankel transform – Some important results for Bessel function – Linearity property – Hankel Transform of the derivatives of the function – Hankel Transform of differential operators.

UNIT IV

(18 Hours)

Definition, Regularity Conditions – Special Kind of Kernels – Eigen values and Eigen functions – Convolution Integral – The Inner or Scalar Product of Two Functions – Notation – Integral Equations with Separable Kernals: Reduction to a System of Algebraic Equations – Examples– Fredholm Alternative – Examples.

UNIT V

(18 Hours)

Method of Successive Approximations: Iterative Scheme – Examples – Volterra Integral Equation – Examples – Some Results about the Resolvent Kernel - Classical Fredholm Theory: The Method of Solution of Fredholm – Fredholm’s First Theorem – Examples – Fredholm’s Second Theorem.

UNIT VI - Self-Study for Enrichment(Not included for End Semester Examinations)

Hamilton’s Principle - Finite Fourier transforms- Parseval’s Theorem- An Approximate Method – Fredholm Integral Equation of the First Kind - Fredholm’s Third Theorem.

Text books

1. Francis.B. Hildebrand,(1972), Methods of Applied Mathematics, Prentice – Hall of India Pvt Ltd, New Delhi.
2. Vasishtha.A.R. and Gupta.R.K,(2002), Integral Transforms, Krishna Prakashan Media Pvt Ltd
3. Ram.P.Kanwal,(1971), Linear Integral Equations, Academic Press.

Chapters and Sections

Unit I	Chapter 2	Sections 2.1 to 2.8 [1]
Unit II	Chapter 6	Sections 6.1 to 6.20[2]
Unit III	Chapter 9	Sections 9.1 to 9.6[2]
Unit IV	Chapter 1	Sections 1.1 to 1.7[3]
	Chapter 2	Sections 2.1 to 2.4[3]
Unit V	Chapter 3	Sections 3.1 to 3.5[3]
	Chapter 4	Sections 4.1 to 4.4[3]

Reference Books

1. Gupta,A.S.(2006), Calculus of Variations with Applications, Prentice Hall of India Private Limited, New Delhi.
2. Raisinghania,M.D. (2007), Integral Equations and Boundary Value Problems, S.Chand & Company Ltd, New Delhi.
3. Gupta.P.P and Sunjay Gupta,(2003), Integral Transforms, Kedarnath Ram Nath , Meerut.

Web References

1. <https://youtu.be/70lYJs2xL6Q>
2. <https://youtu.be/HlwYQqUdrQs>
3. <https://youtu.be/6HeQc7CSkZs>
4. <https://youtu.be/UKHBWzoOKsY>
5. <https://youtu.be/3OCYjT5h23w>
6. <https://youtu.be/pAwvErIGIV8>
7. <https://youtu.be/HH9QH692AZE>

Pedagogy

Chalk and talk, Power point presentation, Discussion, Assignment, Quiz, Seminar.

Course Designers

1. Dr. S. Sasikala.
2. Dr. R. Radha.

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PMA1CC4	ALGEBRAIC NUMBER THEORY	CORE	6	5

Course Objective

- **Explore** fundamental concepts of divisibility, Congruences and primes.
- **Analyze** the quadratic Residues, The Mobius Inversion formula, Diophantine equations and their problems.
- **Apply** the ideas of Pythagorean triangle and The Chinese remainder theorem to solve problems.

Prerequisite

Theory of Numbers, Abstract Algebra

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Apply the concepts of divisibility, congruences, primes, primitive roots, quadratic residues, greatest integer functions and linear equations.	K3
CO2	Explore the concepts of arithmetic functions, prime modulus and congruences of Degree two.	K3
CO3	Relate the ideas of Chinese remainder theorem, quadratic reciprocity and The Mobius Inversion formula.	K3
CO4	Determine the solutions of congruences, techniques of numerical calculations, Jacobi symbol, recurrence functions and simultaneous linear equations.	K4
CO5	Examine the conceptual understanding in Pythagorean triangles, Legendre Symbol and related problems.	K4

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	3
CO2	2	3	2	3	2	2	2	2	2	3
CO3	3	3	2	3	3	3	2	2	2	3
CO4	3	3	3	3	3	3	3	2	2	3
CO5	3	3	3	3	3	3	3	2	2	3

Syllabus

UNIT I

(18 Hours)

Divisibility and Congruences

Introduction – Divisibility – The Binomial Theorem – Congruences – Solutions of Congruences – The Chinese Remainder Theorem.

UNIT II

(18 Hours)

Congruences

Techniques of Numerical Calculation — Prime Power Moduli – Prime Modulus – Congruences of Degree Two, Prime Modulus – Public Key Cryptography.

UNIT III

(18 Hours)

Quadratic Reciprocity and Quadratic Forms

Quadratic Residues – Quadratic Reciprocity – The Jacobi Symbol – Binary Quadratic Forms – Equivalence and Reduction of Binary Quadratic Forms – Sums of Two Squares.

UNIT IV

(18 Hours)

Some Functions of Number Theory

Greatest Integer Function – Arithmetic Functions – The Mobius Inversion Formula.

UNIT V

(18 Hours)

Some Diophantine Equations

The Equation $ax + by = c$ – Simultaneous Linear Equations – Pythagorean Triangles.

UNIT VI - Self-Study for Enrichment (Not included for End Semester Examinations)

Primes - Primitive Roots and Power Residues - Positive Definite Binary Quadratic Forms
- Recurrence Functions - Assorted Examples.

Text Books

1. Ivan Niven, Herbert S. Zuckerman & Hugh L. Montgomery (2016) Reprint, *An Introduction to the Theory of Numbers, (Fifth Edition, Reprint 2016)*. Wiley Publishers.

UNIT – I	Chapter 1	Sections 1.1, 1.2 & 1.4
	Chapter 2	Sections 2.1 to 2.3
UNIT – II	Chapter 2	Sections 2.4 to 2.7 & 2.9
UNIT – III	Chapter 3	Sections 3.1 to 3.6
UNIT – IV	Chapter 4	Sections 4.1 to 4.3
UNIT – V	Chapter 5	Sections 5.1 to 5.3

Reference Books

1. David M. Burton (2012), *Elementary Number Theory (Sixth Edition)*, Tata McGraw Hill Education Private Limited, New Delhi.
2. Telang S. G. (2005), *Number Theory* (Reprint 2001), Tata McGraw Hill Education Private Limited, New Delhi.
3. Melvyn B. Nathanson (2005), *Methods in Number Theory* (Reprint 2006), Springer-Verlag, New York, Inc.

Web References

1. https://www.youtube.com/watch?v=ChG_7jeNRHo
2. <https://www.youtube.com/watch?v=e8DtzQkjOMQ>
3. <https://www.youtube.com/watch?v=3W91U-aNclQ>
4. <https://www.youtube.com/watch?v=bg6CksAkZ-k>
5. <https://www.youtube.com/watch?v=4dVTIX4bwP0>
6. <https://www.youtube.com/watch?v=khfIH1H6iUg>
7. <https://www.youtube.com/watch?v=BC2BdenKsYs>

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Vidhya.

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PMA1DSE1A	ADVANCED NUMERICAL ANALYSIS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To **know** the theory behind various numerical methods.
- To **apply** these methods to solve mathematical problems.
- To **train** the students to develop analytical thinking and the study of stability analysis.

Prerequisite

A reasonable background in linear algebra, numerical analysis, partial differential equations, and finite difference methods.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Apply various methods to solve transcendental and polynomial equations	K3
CO2	Use the concepts of interpolation analyze Eigen value problem with Techniques for Mathematical Problems arising in various fields	K4
CO3	Classify the various techniques of interpolation and approximation	K3
CO4	Compute the numerical differentiation problems	K3
CO5	Apply the knowledge of various methods to solve numerical integration problems	K3

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	3	2	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	3	2	3	3	3	2	2	3
CO4	2	2	2	2	3	2	2	2	2	3
CO5	3	3	3	3	3	3	3	3	2	3

Syllabus

UNIT I

(18 Hours)

Transcendental and polynomial equations

Rate of convergence – Polynomial equations: Descartes' Rule of Signs - Iterative Methods: Birge-Vieta method - Bairstow's method.

UNIT II

(17 Hours)

System of Linear Algebraic equations and Eigen Value Problems

Error Analysis for Direct methods – Iteration methods - Eigen values and Eigen vectors – Jacobi method for symmetric matrices - Power method.

UNIT III

(18 Hours)

Interpolation and Approximation

Hermite Interpolation - Piecewise and Spline Interpolation.

UNIT IV

(17 Hours)

Differentiation

Numerical Differentiation – Optimum choice of Step length – Extrapolation methods.

UNIT V

(20 Hours)

Integration

Numerical Integration - Methods based on undetermined coefficients: Newton- Cotes methods: Trapezoidal Method - Simpson's Method - Gauss Legendre Integration Methods - Lobatto Integration Methods.

UNIT VI - Self -Study for Enrichment(Not included for End Semester Examinations)

Direct Method - Graeffe's root squaring method- Gauss Seidel Iteration method - Bivariate Interpolation: Lagrange Bivariate interpolation - Partial Differentiation - Gauss-Chebyshev Integration Methods.

Text Book

Jain. M. K, Iyengar. S. R. K. and Jain. R. K. (Sixth Edition), *Numerical Methods for Scientific and Engineering Computation*, New Age International (P) Limited Publishers, New Delhi.

Chapters and Sections

UNIT-I	Chapter 2	Sections 2.5 and 2.9(Page No. 83 - 93)
UNIT-II	Chapter 3	Sections 3.3 – 3.5, 3.7, 3.11
UNIT-III	Chapter 4	Sections 4.5 and 4.6
UNIT- IV	Chapter 5	Sections 5.2 - 5.4
UNIT- V	Chapter 5	Sections 5.6 (Page No. 348) and 5.8(Page No. 356-365, 380-382)

Reference Books

1. Jain. M. K, (1983), *Numerical Solution of Differential Equations*(2nd Edition), New Age International Pvt Ltd.,
2. Samuel. D. Conte and Carl. DeBoor, (1988), *Elementary Numerical Analysis*(3rd Edition), McGraw-Hill International.
3. Kendall E. Atkinson, (1989), *An Introduction to Numerical Analysis*(2nd Edition), John Wiley & Sons.

Web References

1. https://www.youtube.com/watch?v=hTVjuH6J_C8
2. <https://www.youtube.com/watch?v=EMPyjetvaDg>
3. <https://www.youtube.com/watch?v=YkrSgTBznek>
4. <https://www.youtube.com/watch?v=-fE3I-usIKk>
5. <https://www.youtube.com/watch?v=gyyKvonahXk>.

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Ms. R. Soundaria
2. Dr. P.Sudha

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PMA1DSE1B	MATHEMATICAL MODELLING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- **Analyze** the different mathematical models through Ordinary differential equation and Differential Equations.
- **Understand** the implementation of graph theoretical models.
- **Summarize** and implementation the kinds of Difference equations.

Prerequisite

Classification of ordinary differential equations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Classify the models through Ordinary Differential equations.	K3
CO2	Evaluate the systems of Ordinary Differential equations for various models.	K4
CO3	Examine the Planetary motions through Ordinary Differential equations of second order.	K4
CO4	Explain the basic concepts of Difference equation.	K4
CO5	Compute various types of models through Difference equation.	K3

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	2	2	2	3
CO2	2	3	3	2	2	2	3	2	2	3
CO3	2	2	3	3	3	3	3	2	3	3
CO4	3	3	2	2	3	3	3	3	2	2
CO5	2	2	3	3	2	3	2	2	2	3

Syllabus

UNIT I

(18 Hours)

Mathematical Modelling through Ordinary Differential Equations of First order

Mathematical Modelling Through Differential Equations- Linear Growth and Decay Models – Non-Linear Growth and Decay Models – Compartment Models – Mathematical Modelling in Dynamics Through Ordinary Differential Equations of First Order.

UNIT II

(18 Hours)

Mathematical Modelling through Systems of Ordinary Differential Equations of First Order

Mathematical Modelling in Population Dynamics – Mathematical Modelling of Epidemics Through Systems of Ordinary Differential Equations of First Order – Compartment Models Through Systems of Ordinary Differential Equations – Mathematical Modelling in Medicine, Arms Race, Battles and International Trade in Terms of Systems of Ordinary Differential Equations – Mathematical Modelling in Dynamics Through Systems of Ordinary Differential Equations of First Order.

UNIT III

(20 Hours)

Mathematical Modelling Through Ordinary Differential Equations of Second Order

Mathematical Modelling in Planetary Motions – Mathematical Modelling in Circular Motion and Motion of Satellites – Mathematical Modelling Through Linear Differential Equations of Second Order.

UNIT IV

(17 Hours)

Mathematical Modelling Through Difference Equations

The Need for Mathematical Modelling Through Differential Equations: Some Simple Models – Basic Theory of Linear Difference Equations with Constant Coefficients – Mathematical Modelling Through Differential Equations in Economics and Finance– Mathematical Modelling Through Differential Equations in Probability Theory.

UNIT V

(17 Hours)

Mathematical Modelling through Graphs

Situations that can be Modelled Through Graphs – Mathematical Models in Terms of Directed Graphs–Mathematical Models in Terms of Signed Graphs–Mathematical Models in Terms of Weighted Digraphs.

UNIT VI - Self-Study for Enrichment(Not included for End Semester Examinations)

Mathematical Modelling of Geometrical problems Through Ordinary Differential Equations of First Order - Mathematical Modelling in Economics Through Systems of Ordinary Differential Equations of First Order - Miscellaneous Mathematical Models Through Systems of Ordinary Differential Equations of Second Order - Mathematical Modelling Through Differential Equations in Population Dynamics and Genetics - Mathematical Modelling in Terms of Unoriented Graphs.

Text Books

1. J N Kapur, (Reprint 2001). *Mathematical Modelling*. New Age International (P) Limited, Publishers, New Delhi.

UNIT-I Chapter 2: Sections 2.1 to 2.5

UNIT-II Chapter 3 Sections 3.1 to 3.3 & 3.6

UNIT-III Chapter 4 Sections 4.1 to 4.3

UNIT- IV Chapter 5 Sections 5.1 to 5.3&5.5

Chapter 7 Sections 7.1 to 7.4

UNIT- V Chapter 15 Sections 15.1 to 15.3.6 [2]

Chapter 16 Sections 16.2 to 16.2.5, 16.5, 16.5.1 to 16.5.3 [2].

Reference Books

1. Bimal K.Mishra & Dipak K.Satpathi (First Edition, Reprint 2009). *Mathematical Modeling Applications, Issues and Analysis(1st Edition)*. Ane Books Pvt. Ltd.
2. Edward A. Bender. *An Introduction to Mathematical Modelling*(Reprint 2000).Dover Publications.
3. Rutherford A. *Mathematical Modelling Techniques*(Revised Edition 2012).Dover Publications.

Web References

1. <https://www.youtube.com/watch?v=3Yfsh1SnGIw>
2. <https://www.youtube.com/watch?v=EdtwK8KSwOo>
3. <https://www.youtube.com/watch?v=zcz5GhkvLY>
4. <https://www.youtube.com/watch?v=-wVCKOvceok>
5. <https://www.youtube.com/watch?v=BZwp8gAxvUc>

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment and Smart Classroom.

Course Designer

1. Dr R. Buvaneswari.

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PMA1DSE1C	BOUNDARY VALUE PROBLEMS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- **Gain** expertise and confidence in proving theorems to progress in mathematical studies.
- **Analyze** the implementation of boundary value problem through various models.
- **Summarize** the various aspects of boundary value problem.

Prerequisite:

- Exposure on Fourier series and Differential Equations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Apply real world scenarios in order to solve the problems using multiple approaches.	K3
CO2	Classify Boundary value problems and learn their distinguishing qualitative properties.	K3
CO3	Relate the applications of Laplace and Poisson Equations	K3
CO4	Determine the understanding of Fourier Bessel Series	K4
CO5	Analyze Dirichlet Problems and its solutions in various Regions.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	2	2	2	3
CO2	2	3	3	2	2	2	3	2	2	3
CO3	2	2	3	3	3	3	3	2	3	3
CO4	3	3	2	2	3	3	3	3	2	2
CO5	2	2	3	3	2	3	2	2	2	3

Syllabus

UNIT I

(18 Hours)

One-sided Derivatives- An Integration Formula – Preliminary Theory –
A Fourier Theorem- Discussion of the Theorem.

UNIT II

(17 Hours)

Formal and Rigorous Solutions – The Vibrating String, Initially Displaced – Discussion
of the Solution – Prescribed Initial Velocity – Non homogeneous Differential Equations –
Elastic Bar- Temperatures in a Bar.

UNIT III

(18 Hours)

A Dirichlet Problem – Fourier Series in Two Variable – An Application of Fourier
Integrals – Temperatures $u(x,t)$ in an Unlimited Medium

Fourier-Bessel Series-Temperatures in a Long Cylinder-Heat Transfer at the Surface of
the Cylinder.

UNIT IV

(17 Hours)

Dirichlet Problems in Spherical Regions – Steady Temperature in a Hemisphere.

UNIT V

(20 Hours)

Cauchy Criterion for Uniform Convergence –Abel's Test for Uniform Convergence –
Uniqueness of Solutions of the Heat Equation – Example – Solutions of Laplace's or Poisson's
Equation.

UNIT VI - Self-Study for Enrichment(Not included for End Semester Examinations)

Other Forms of Fourier Series –The Orthonormal Trigonometric Functions - Other Boundary Conditions - Observations and Further Examples - Vibration of a circular Membrane - Other Orthogonal Sets - An Application.

Text Books

1. Ruel V Churchill. (1963). Fourier Series and Boundary Value Problems (Second Edition). McGraw-Hill Book Company.

UNIT-I	Chapter 4	Sections 38 to 42
UNIT-II	Chapter 7	Sections 55 to 61
UNIT-III	Chapter 7	Sections 63 to 66
	Chapter 8	Sections 78 to 80
UNIT-IV	Chapter 9	Sections 89 to 90
UNIT-V	Chapter 10	Sections 92 to 96

Reference Books

1. Raisinghania, M.D.(2014). Ordinary and Partial Differential Equations(1st Edition). S.Chand & Company Pvt.Ltd.
2. George F Simmons, (2003). Differential Equations with Applications and Historical Notes(2nd Edition). Tata McGraw-Hill Publishing Company.
3. Sankara Rao, K. (2019). Introduction to Partial Differential Equations(3rd Edition). Prentice-Hall of India.

Web References

1. <https://www.youtube.com/watch?v=m8aIO-GQkXE>
2. <https://www.youtube.com/watch?v=AgveJEO2a-k>
3. https://www.youtube.com/watch?v=O_HgMWx4a5w
4. <https://www.youtube.com/watch?v=1tDkXMDbvDg&t=119s>
5. <https://www.youtube.com/watch?v=USOmOW-IN3I>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Ms. P. Geethanjali.

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2CC5	ALGEBRA – II	CORE	6	5

Course Objective

- Learn the fundamentals in Galois theory
- Expertise and confidence in proving theorems to progress in Galois theory
- Familiarize the concepts of Galois group

Prerequisite:

- Basic knowledge of algebra.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able To	
CO1	Analyse the important concepts of Galois theory and identify through various examples	K1, K2, K3
CO2	Predict the notions and their connections of Galois theory	K3
CO3	Examine the proof of solvability by Galois theory	K4
CO4	Evaluate clear cut idea in Galois theory extensions and illustrate through examples	K5
CO5	Learn and conclude Galois theory correspondence theorem of algebra	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	2	2
CO2	3	3	3	2	2	3	3	3	2	2
CO3	3	3	3	3	3	3	3	2	3	3
CO4	2	2	3	3	3	2	2	3	3	3
CO5	2	2	3	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Prime Ideals and Maximal Ideals - Irreducible Polynomials.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Classical Formulas - Splitting Fields.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	The Galois Group - Roots of Unity - Solvability by Radicals.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Independence of Characters - Galois Extensions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	The Fundamental Theorem of Galois Theory – Applications – Galois’s Great Theorem.	18	CO1, CO2, CO3,	K1, K2, K3,

			CO4, CO5	K4, K5
VI	Self-Study for Enrichment (Not included for End Semester Examinations) Rings - Domains and Fields - Homomorphism and Ideals - Quotients Rings- Polynomial Rings over Fields.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

Joseph Rotman (2006), *Galois Theory*, 2nd Edition, Springer Verlag

Chapters and Pages

UNIT I Pages 31- 43

UNIT II Pages 44-58

UNIT III Pages 59-75

UNIT IV Pages 76-82

UNIT V Pages 83-95

Reference Books

1. David S. Dummit and Richard M. Foote (Reprint 2017), *Abstract Algebra*, Wiley and Sons, Third Edition
2. John B. Fraleigh (2018), *A First Course in Abstract Algebra*, Narosa Publishing House, Seventh edition
3. I. N. Herstein (2006), *Topics in Algebra*, John Wiley, Second Edition

Web References

1. <https://nrich.maths.org/1422>
2. <https://www.math3ma.com/blog/what-is-galois-theory-anyway>
3. https://people.math.harvard.edu/~elkies/M250.01/galois_topix.html
4. <https://www.maths.ed.ac.uk/~tl/gt/gt.pdf>
5. <https://mathoverflow.net/questions/34125/is-galois-theory-necessary-in-a-basic-graduate-algebra-course>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. K. Kalaiarasi

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2CC6	REAL ANALYSIS	CORE	6	5

Course Objective

- **Identify** the elements and importance of real numbers.
- **Provide** students with the specialist knowledge necessary for basic concepts in Real Analysis.
- **Apply** the proof techniques in analysis to be well prepared for the advanced courses.

Prerequisites

Basic set theory and Calculus

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe fundamental properties of the real numbers that lead to the formal development of real analysis.	K2
CO2	Construct the important concepts of real analysis.	K3
CO3	Ascertain the concepts of basic topology, continuity, differentiation, The Riemann-Stieltjes Integral, sequences and series of functions, functions of several variables.	K4
CO4	Explain various mathematical proofs of basic results in real analysis.	K5
CO5	Develop the abstract ideas and various methods in mathematical analysis that can be applied to important practical problems.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	2	2	2	3
CO2	3	2	3	3	3	3	2	3	2	3
CO3	3	3	3	3	3	3	2	3	3	3
CO4	3	2	3	3	2	3	2	2	2	3
CO5	3	3	3	3	2	3	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basis Topology: Finite, Countable and Uncountable Sets – Metric Spaces – Compact Sets – Connected Sets.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
II	Continuity and Differentiation: Limits of Functions – Continuous Functions – Continuity and Compactness – Continuity and Connectedness – Discontinuities – Monotonic Functions – The Derivative of a Real Function – Mean value Theorems – The Continuity of Derivatives – L’ Hospital’s Rule – Derivatives of Higher Order – Taylor’s Theorem.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
III	The Riemann-Stieltjes Integral: Definition and Existence of the Integral – Properties of the Integral – Integration and Differentiation.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
IV	Sequences and Series of Functions: Discussion of Main Problem – Uniform Convergence – Uniform Convergence and Continuity – Uniform Convergence and Integration – Uniform	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6

	Convergence and Differentiation – The Stone-Weierstrass Theorem.			
V	Functions of Several Variables Differentiation – The Contraction Principle – The Inverse Function Theorem – The Implicit Function Theorem.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Perfect Sets – Infinite Limits and Limits at Infinity – Integration of Vector-valued Functions – Equicontinuous Families of Functions - Linear Transformations.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4, K5, K6

Text Books

1. Walter Rudin (1986). *Principles of Mathematical Analysis (Third Edition)*. McGraw-Hill Book Company.

Chapters and Sections

UNIT-I	Chapter 2: Sections 2.1 – 2.42, 2.45 – 2.47
UNIT-II	Chapter 4: Sections 4.1 – 4.31 Chapter 5: Sections 5.1 – 5.15
UNIT-III	Chapter 6: Sections 6.1 – 6.22
UNIT- IV	Chapter 7: Sections 7.1 – 7.18, 7.26 – 7.33
UNIT- V	Chapter 9: Sections 9.10 – 9.29

Reference Books

1. Robert G. Bartle and Donald R. Sherbert. (2019). *Introduction to Real Analysis (Fourth Edition)*. Wiley India Pvt. Limited.
2. Tom M. Apostol. (2002). *Mathematical Analysis (Second Edition)*. Narosa Publishing House.
3. H.L. Royden. (2003). *Real Analysis (Third Edition, Ninth Reprint)*. PHI Learning Private Limited, New Delhi.

Web References

1. <https://youtu.be/mfoVRabIpQI>
2. <https://tinyurl.com/c756hc6k>
3. <https://youtu.be/6mNGn8dTnJw>
4. https://youtu.be/xIwg_w2quRE
5. <https://youtu.be/yLbgdL9HAeg>
6. <https://tinyurl.com/mux7d53w>
7. <https://youtu.be/8VTG6EsyJh4>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. S. Vidhya

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2CC7	LINEAR ALGEBRA	CORE	6	5

Course Objectives

- **Acquire** knowledge related to basic concepts.
- **Develop** rational thinking patterns in terms of problem solving in competitive exam.
- **Emphasis** knowledge of the various aspects of Linear Algebra.

Prerequisite

Basic Knowledge of algebra and vector space.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember and recall the basic concepts of vector space	K1
CO2	Illustrate the various techniques of problem solving in respective stream	K2
CO3	Apply different terminologies of linear algebra	K3
CO4	Classify the various properties in transformation	K4
CO5	Interpret the problems involved in vector spaces	K5

Mapping of CO with PO and PSO

os	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	3	2	3	2	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	2	2	3	2	3	3	3	2	2	3
CO4	2	2	2	2	3	2	2	2	2	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Matrices: Systems of Linear Equations – Matrices and Elementary Row Operations – Row reduced Echelon Matrices – Invertible Matrices – Bases and Dimension.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Linear Transformations: Linear Transformations - The Algebra of Linear Transformations – Isomorphism of Vector Spaces – Representation of Transformations by Matrices – Linear Functionals – The Transpose of a Linear Transformation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Polynomials:	18	CO1, CO2, CO3,	K1, K2, K3,

	Algebras - The Algebra of Polynomials – Polynomial Ideals – The Prime Factorization of a Polynomial . Determinants: Commutative rings – Determinant functions.		CO4, CO5	K4, K5
IV	Determinants: Permutations and the Uniqueness of Determinants — Introduction - Characteristic values – Annihilating Polynomials.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Elementary Canonical Forms: Invariant Subspaces –Direct – Sum Decompositions – Invariant Direct Sums – The Primary Decomposition Theorem.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self -Study for Enrichment: (Not included for End Semester Examination) Matrix Multiplication - The Double Dual - Lagrange Interpolation - Additional Properties of Determinants - Simultaneous Triangulation and Simultaneous Diagonalization.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

Kenneth Hoffman and Ray Alden Kunze (1975). *Linear Algebra*, Second Edition, Prentice Hall of India Private Limited, New Delhi.

Chapters and Sections

UNIT-I	Chapter 1: Sections 1.2 – 1.4, 1.6 Chapter 2: Sections 2.3
UNIT-II	Chapter 3: Sections 3.1 – 3.5, 3.7
UNIT-III	Chapter 4: Sections 4.1, 4.2, 4.4, 4.5 Chapter 5: Sections 5.1 – 5.2
UNIT- IV	Chapter 5: Sections 5.3 Chapter 6: Sections 6.1 – 6.3
UNIT- V	Chapter 6: Sections 6.4, 6.6 – 6.8

Reference Books

1. Kumaresan S(2004). *Linear Algebra: A Geometric Approach*, Prentice – Hall of India Ltd.
2. Rao A. R, Bhimashankaram P(2000). *Linear Algebra, Second Edition*, Tata McGraw Hill.
3. Edgar Goodaire G(2014). *Linear Algebra*, Pure & Applied World Scientific, Cambridge University Press India Ltd.

Web References

1. <https://youtu.be/Pc2dWW3aSrK>
2. <https://youtu.be/shs8lWDOBHO>
3. <https://youtu.be/nPOooyrM5is>
4. <https://youtu.be/uJNQPgYjlQc>
5. <https://youtu.be/6PEKr7vWsrw>
6. <https://ksuweb.kennesaw.edu>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. P.Shalini

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2CCC1A	PARTIAL DIFFERENTIAL EQUATIONS	CORE CHOICE	6	4

Course Objective

- **Recognize** certain basic types of first and second order PDEs and an in-depth knowledge of solving them by various methods.
- **Analyze** the Characteristics and Compatibility of PDE's.
- **Qualitative Analysis** of the solutions of Boundary value Problems.

Prerequisite

Fundamental knowledge of Partial differential equations in UG.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Interpret the solutions of hyperbolic, linear and second order partial differential equations, Exterior, Interior and boundary value problems using various Methods.	K2
CO2	Develop the various type of first and second order equations, Interior and Exterior value problems and Determine the higher order equations in physics, Characteristics of Equations in Three Variables, Linear Hyperbolic Equations and Elementary Solutions of Laplace's Equation.	K3
CO3	Diagnose the orthogonally, compatibility and characteristics of the partial differential equations with constant and variable coefficients, method of Integral transforms and Families of Equipotential Surfaces.	K3
CO4	Discriminate the solutions of first, second order and hyperbolic equations, Integral Surfaces Passing through a Given Curve, Surfaces Orthogonal to a Given System of Surfaces, Characteristics of Equations in Three Variables, The Solution of Linear Hyperbolic Equations, Separation of Variables	K4
CO5	Ascertain the concepts of Laplace equation to find the solution of boundary value problems, Special Types of First-Order Equations, Linear Partial Differential Equations with Constant Coefficients, Equations with Variable Coefficients, The Method of Integral Transforms, Families of Equipotential Surfaces.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	1
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Partial Differential Equations of The First Order: Partial Differential Equations - Origins of First-order Partial Differential Equations - Cauchy’s Problem for First-order Equations - Linear Equations of the First Order - Integral Surfaces Passing through a Given Curve - Surfaces Orthogonal to a Given System of Surfaces.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4
II	Partial Differential Equations of The First Order: Cauchy’s Method of Characteristics - Compatible Systems of First-order Equations – Charpit’s Method - Special Types of First-Order Equations - Jacobi’s Method.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4
III	Partial Differential Equations of the Second Order: The Origin of Second-order Equations – Second-order Equations in Physics – Higher-order Equations in Physics - Linear Partial Differential Equations with Constant Coefficients - Equations with Variable Coefficients.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4

IV	Partial Differential Equations of the Second Order: Characteristics of Equations in Three Variables - The Solution of Linear Hyperbolic Equations - Separation of Variables - The Method of Integral Transforms.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4
V	Laplace's Equation: Elementary Solutions of Laplace's Equation - Families of Equipotential Surfaces - Boundary Value Problems - Separation of Variables.	18	CO1, CO2, CO3, CO4, CO5	K2, K3, K4
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Nonlinear Partial Differential Equations of the First Order - Solutions Satisfying Given Conditions - Characteristic Curves of Second-Order Equations – Nonlinear Equations of the Second Order– Problems with Axial Symmetry.	-	CO1, CO2, CO3, CO4, CO5	K2, K3, K4

Text Book

1. Ian N. Sneddon (2006), *Elements of Partial Differential Equations*, Dover Publication – INC. Mineola, Newyork.

Chapters and Sections

UNIT- I	Chapter 2:	Sections 1 to 6
UNIT- II	Chapter 2:	Sections 8 to 11, 13
UNIT- III	Chapter 3:	Sections 1 to 5
UNIT- IV	Chapter 3:	Sections 7 to 10
UNIT- V	Chapter 4:	Sections 2 to 5

Reference Books

1. M.D.Raisinghania (2001), *Advanced Differential Equations*, Eighth Edition, S.Chand and Company Ltd., NewDelhi.
2. T.Amarnath (2003), *Elementary Course in Partial Differential Equations*, Second Edition, Narosa Publishing House, New Delhi.
3. Sauvigny, Friedrich (2006), *A Partial Differential Equations 2: Functional Analytic Methods*, Springer, Arizona.

Web References

1. <https://people.bath.ac.uk/mir20/images/odenotes.pdf>
2. <https://pages.pomona.edu/~ajr04747/Spring2014/Math182/Notes/Math182Spring2014Notes.pdf>
3. <https://www.youtube.com/watch?v=VBn1diQCykQ>
4. <https://www.youtube.com/watch?v=f0FeWyloHrs>
5. <https://nptel.ac.in/courses/111106139>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. G. Janaki

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2CCC1B	MATHEMATICAL PROGRAMMING	CORE CHOICE	6	4

Course Objectives

- Ability to **Understand** and **Analyze** managerial problems in industry so that they are able to use resources (capitals, materials, staffing, and machines) more effectively.
- **Knowledge** of formulating mathematical models for quantitative analysis of managerial problems in industry.
- **Allows** a quantitative technique or a scientific approach for making better decisions for operations under the control.

Prerequisite

Basic Knowledge of Operations Research.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry	K1, K2
CO2	Know how to use variables for formulating complex mathematical models in management science, industrial engineering and Transportation science and in real life.	K3
CO3	Analyze a managerial decision problem and formulate into a mathematical model	K4
CO4	To design, improve and operate complex systems in the best possible way	K4, K5
CO5	Determine the solution of NonLinear Programming based on Various Method.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	2	3
CO3	3	2	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	3	3	3
CO5	3	3	2	3	3	3	2	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Advanced Linear Programming: From Extreme Points to Basic Solutions - Generalized Simplex Tableau in Matrix form - Development of the Optimality and Feasibility Conditions - Revised Simplex Algorithm.	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Integer Linear Programming: Integer Programming Algorithms – Cutting Plane Algorithm. Deterministic Dynamic Programming: Recursive Nature of Dynamic Programming(DP) Computations.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Simulation Modeling : Monte Carlo Simulation – Types of Simulation – Sampling from Probability Distribution.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Classical Optimization Theory: Unconstrained Problems – Necessary and Sufficient Conditions – The Newton – Raphson Method – Constrained Problems – Equality Constraints (Jacobi Method).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Non Linear Programming Algorithms: Unconstrained Algorithms – Direct Search Method – Gradient Method - Constrained Algorithms – Quadratic Programming.	19	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self -Study for Enrichment: (Not included for End Semester Examinations) Duality – Matrix Definition of the Dual Problem – Optimal Dual Solution – Forward and Backward Recursion – Generation of Random Numbers – Equality Constraints (Lagrangean Method) – Chance-Constrained Programming.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

Hamdy A.Taha, Ninth Edition, (2014), *Operations Research*, Dorling Kindersley (India) Pvt. Ltd.

Chapters and Sections

UNIT-I	Chapter 7: Sections 1.1, 1.2, 2.1 - 2.2 (Page No. 299 - 313)
UNIT-II	Chapter 8: Sections 2, 2.2 (Page No. 355, 364 - 373), Chapter 11: Sections1 (Page No. 461 - 464)
UNIT-III	Chapter 17: Sections 1, 2, 3.2 (Page No. 681 – 686, 688 - 694)
UNIT- IV	Chapter 18: Sections 1, 1.1, 1.2, 2, 2.1(Page No. 713 - 726)
UNIT- V	Chapter 19: Sections 1, 1.1, 1.2, 2, 2.2 (Page No. 737 – 744, 753 – 758)

Reference Books

1. KantiSwarup, P.K. Gupta, ManMohan, Nineteenth Edition (2017), *Operations Research*, Sultan Chand and Sons Publishers.
2. J.K. Sharma, Fourth Edition (2009), *Operations Research Theory and Applications*, Macmillan India Limited.
3. S.S. Rao, Second Edition (1985), *Optimization Theory and Applications*, New Age International Ltd.

Web References

1. https://www.youtube.com/watch?v=ii_oSKROeRI
2. <https://www.youtube.com/watch?v=NSrIb7mKtwg>
3. <https://faculty.ksu.edu.sa/sites/default/files/index.pdf>
4. <https://www.youtube.com/watch?v=eo2tOPV3AoE>
5. <https://www.youtube.com/watch?v=9ESUw4azhKE>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. E. Litta.

Semester II	Internal Marks: 25		ExternalMarks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS /WEEK	CREDITS
22PMA2CCC1C	DIFFERENCE EQUATIONS	CORE CHOICE	6	4

Course Objective

- **Analyze** the linear difference equations of higher order.
- **Understand** the implementation of nonlinear difference equations..
- **Summarize** the results of oscillation for linear difference equations with systems of variables..

Prerequisite

Classification of linear difference equations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall and Classify the models through linear difference equations of high- order..	K1, K2
CO2	Interpret the systems of two or more dependent variables for various models.	K2
CO3	Solve the Planetary motions through the study of a linear difference or differential equations to examination of an associated complex function..	K3
CO4	Analyze the basic concepts of Difference equations.	K4
CO5	Determine various types of models through the solutions oscillate around zero or eventually positive or eventually negative and also oscillation theory for self-adjoint equations	K5

Mapping of CO with POs and PSOs

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	3	2	2	2	3
CO2	2	3	3	2	2	2	3	2	2	3
CO3	2	2	3	3	3	3	3	2	3	3
CO4	3	3	2	2	3	3	3	3	2	2
CO5	2	2	3	3	2	3	2	2	2	3

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Linear Difference Equations of Higher Order</p> <p>Difference Calculus: The power Shift, Factorial Polynomials and The Antidifference Operator - General Theory of Linear Difference Equations - Linear Homogeneous Equations with Constant Coefficients</p> <p>Nonhomogeneous Equations: Method of Undetermined coefficients : The Method of Variation of Constants (Parameters)</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>System of Linear Difference Equations</p> <p>Autonomous (Time –Invariant) Systems : The Discrete Analogue of the Putzer Algorithm, The Development of the Algorithm for A^n – the Basic Theory</p> <p>The Jordan form: Autonomous (Time – Invariant) Systems Revisited : Diagonalizable Matrices, The Jordan Form and Block-Diagonal Matrices.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>The Z-Transform Method and Volterra Difference Equations</p> <p>Definition and Examples : Properties of the Z-Transform – The Inverse Z-transform and Solutions of Difference Equations : The Power Series Method, The Partial Fractions Method and The Inversion Integral Method</p> <p>Volterra Difference Equations of convolution types: The Scalar Case.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>Oscillation Theory</p> <p>Three-Term Difference Equations – Self-Adjoint Second- Order Equations.</p>	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	Asymptotic Behavior of Difference Equations Tools and Approximation – Poincare’s theorem : Infinite Products and Perron’s Example – Asymptotically Diagonal Systems – High- Order Difference Equations	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examination) Limiting behavior of solutions – Linear Periodic System - Volterra Systems - Nonlinear Difference Equations - Second- Order Difference Equations : A Generalization of the Poincare Perron Theorem.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Saber N Elaydi, Third Edition, (2004), *An Introduction to Difference Equations*, Springer Verlag, New York.

UNIT-I	Chapter 2	Section 2.1 - 2.4
UNIT-II	Chapter 3	Sections 3.1 - 3.3
UNIT-III	Chapter 6	Sections 6.1 - 6.3
UNIT- IV	Chapter 7	Sections 7.1 & 7.2 (Page No. 313 – 320)
UNIT- V	Chapter 8	Sections 8.1 - 8.4

Reference Books

1. Ravi P. Agarwal and Kanishka Perera, Reprint, (2006), *Proceedings of the Conference on Differential and Difference Equations and Applications*, Hindawi Publishing Corporation.
2. Ravi P. Agarwal, Second Edition, (2000), *Difference Equations and Inequalities*, Marcel Dekker, Inc., New York.
3. Klaus Neusser, Reprint, (2021), *Difference Equations for Economists* RePEc/ IDEAS.

Web References

1. <https://www.youtube.com/watch?v=zw8xM5GHvZQ>
2. <https://www.youtube.com/watch?v=MtHpbGUIGaA>
3. <https://www.youtube.com/watch?v=ESKx8PEJCB4>
4. https://www.youtube.com/watch?v=_Xub0zCmlXk
5. <https://www.youtube.com/watch?v=IKtROKsWVR4>
6. <https://eprints.kfupm.edu.sa/id/eprint/9906/1/9906.pdf>

Pedagogy

Power point Presentations, Group Discussions, Seminar, Quiz, Assignment and Smart Classroom.

Course Designer

Dr R. Buvaneswari.

Semester II	Internal Marks: 40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PMA2DSE2AP	COMPUTATIONAL MATHEMATICS USING MATLAB - PRACTICAL	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To Provide Software that can be used to explore and experiment with Mathematical Constructions.
- Flexible for users to solve the various system of equations.
- To attain a high level of user support.

Prerequisite

- Basic knowledge of Higher Mathematics

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember the concepts of Algebra, Geometry, Numerical Analysis, Calculus, etc.	K1
CO2	Understand the calculation by reading documented source code	K2
CO3	Relate the mathematical thinking that is applicable to daily life	K3
CO4	Associate technological tools for graphical visualization	K4
CO5	Develop skills with core elements of MATLAB and gain an appreciation of social scientific work	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	2
CO2	3	3	3	2	2	2	3	2	2	3
CO3	2	2	2	2	2	2	2	2	2	2
CO4	2	3	2	3	2	3	2	3	2	2
CO5	2	2	2	2	2	2	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

LIST OF PROGRAMS

1. Mathematical operations
2. Finding GCD and LCM
3. Finding roots and solving the system of equations
4. Matrix Operations
5. Decision Making
6. Loop Types
7. Vector Operations
8. Working with Arrays
9. Plotting 2D Graphs
10. Plotting 3D Graphs
11. Importing and Exporting data in Excel
12. Integration
13. Differentiation and Finding Maxima and Minima
14. Manipulating strings
15. Laplace Transform and Fourier Transform

Web References

1. <https://www.mathworks.com/products/matlab.html>
2. <https://www.mathworks.com/help/matlab/ref/plot.html>
3. <https://www.mathworks.com/help/stateflow/ug/operations-for-vectors-and-matrices.html>
4. https://www.tutorialspoint.com/matlab/matlab_matrices.htm
5. <https://www.javatpoint.com/matlab-numerical-integration>

Pedagogy

Power point presentations and Assignment.

Course Designers

1. Dr. S. Sasikala
2. Ms. R. Soundaria

Semester II	Internal Marks: 40 Marks:60		External	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PMA2DSE2BP	MATHEMATICAL MODELLING USING MATLAB– PRACTICAL	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- **Analyze** the concepts and use the necessary to the real-life problems using MATLAB.
- **Apply** the technical knowledge to **interpret** and **solve** the problems using MATLAB.
- **Explore** the ideas of MATLAB in Mathematical modelling.

Prerequisite

Basic knowledge of Mathematical Modelling and MATLAB.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the importance of Mathematical Modelling in the real world using MATLAB.	K2
CO2	Apply Mathematical concepts to identify the appropriate mathematics to realize a solution using MATLAB.	K3
CO3	Make use of formulas, familiar with memory and file management in MATLAB.	K4
CO4	Determine various types of models through Difference equation .	K5
CO5	Formulate, Analyse and simulate mathematical models using MATLAB.	K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	2	2	2
CO2	3	2	3	3	3	3	3	2	2	2
CO3	3	2	3	3	3	3	3	2	2	2
CO4	3	2	3	3	3	3	3	2	2	2
CO5	3	2	3	3	3	3	3	2	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

LIST OF PROGRAMS

- 1) Lagrange 's Formula for Area of a Rectangle.
- 2) Simple interest and Compound interest.
- 3) Integral equations.
- 4) Calculus of variations in functionals involving two and three independent variables.
- 5) Difference Equation of a System.
- 6) MATLAB programming in dynamic programming.
- 7) Delay differential equations.
- 8) Linear programming in MATLAB.
- 9) Mixed-Integer linear programming.
- 10) Application of Non-linear programming.
- 11) Simulating simple circuit.
- 12) Programming a simple markov model.
- 13) Design Optimization.
- 14) MATLAB solution of a diffusion equation.
- 15) Commodities trading with MATLAB.

Web References

1. <https://www.youtube.com/watch?v=Y93V9wOWETs>
2. <https://www.youtube.com/watch?v=ryxh5CoihwE>
3. <https://www.youtube.com/watch?v=K6vjDI4hzKo>
4. <https://www.youtube.com/watch?v=LpVv306NSnE>
5. <https://www.youtube.com/watch?v=z4aMBaTPW3I>
6. <https://www.youtube.com/watch?v=TCWrD3cZG9s>
7. https://www.youtube.com/watch?v=bJy_QJTOxQA
8. <https://www.mathworks.com/videos/mixed-integer-linear-programming-in-matlab-91541.html>
9. <https://www.youtube.com/watch?v=qTJDNXRfcsc>
10. <https://www.youtube.com/watch?v=yLIQ1dzAsl8>
11. <https://www.youtube.com/watch?v=wr35tzLMMfw>
12. <https://www.mathworks.com/videos/design-optimization-with-matlab-1601644975662.html>
13. <https://www.youtube.com/watch?v=S3DXGvrdx1w>
14. <https://www.youtube.com/watch?v=m6bkXNEKE7E>
15. <https://www.mathworks.com/videos/modeling-an-insulin-infusion-pump-87684.html>

Pedagogy

Power point presentations, Live Demo, Hands on training.

Course Designer

Dr. C. Saranya

Semester II	Internal Marks:40	External Marks:60		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/ Week	CREDITS
22PMA2DSE2CP	ORDINARY DIFFERENTIAL EQUATIONS AND PARTIAL DIFFERENTIAL EQUATIONS USING MATLAB PRACTICAL	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To identify different ordinary and partial differential equation problems and reformulate them in a way that is appropriate for using MATLAB.
- Use functions from the programming language library for efficient calculations and visualization.
- Solve problems systematically and implement the solution in MATLAB.

Prerequisite

Fundamental knowledge of ordinary and partial differential equations.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Describe the use of fundamental data structures	K3
CO2	Apply MATLAB effectively to analyze and visualize data	K4
CO3	Solve scientific and mathematical problems	K4
CO4	Apply basic functions for ordinary and partial differential equations	K3
CO5	Compute programs in MATLAB	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	2	2	3	2	2	3
CO2	3	2	3	2	3	2	3	3	3	3
CO3	3	3	3	2	3	2	3	3	3	2
CO4	3	3	2	3	3	3	2	3	3	3
CO5	3	3	2	3	3	3	2	3	3	3

“1”–Slight (Low)Correlation

“2”–Moderate (Medium)Correlation

“3”– Substantial (High)Correlation

“-” indicates there is no correlation.

LIST OF PROGRAMS

1. Computing the solutions of First Order Differential Equations.
2. Determine the solutions to Initial Value Problems.
3. Plotting the solutions of First Order Differential Equations.
4. Plotting the solution of the second-order equations.
5. Computing the Solutions of the heat equations.
6. Finding the solutions of the Poisson equations.
7. Determine the solutions of Laplace Equations by Direct Method.
8. Computing the solutions of Laplace Equations by Iterative Method.
9. Solving the nonlinear system of Partial Differential Equations.
10. Plotting for the single Partial Differential Equations with the initial conditions.

Web References

1. <https://in.mathworks.com/help/matlab/math/partial-differential-equations.html>
2. <https://www.math.tamu.edu/reu/comp/matode.pdf>
3. <https://www.math.tamu.edu/~phoward/m401/pdemat.pdf>
4. <https://www.youtube.com/watch?v=-DmTK868J4A>
5. <https://www.youtube.com/watch?v=rwC7YU2WUf4>

Pedagogy

Power point presentations, Live Demo, Hands on training.

Course Designers

1. Dr. G. Janaki
2. Ms. A. Gowri Shankari.



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III Cycle) with A Grade by NAAC

ISO 9001:2015 Certified

Annamalai Nagar, Trichy -18.

MINUTES OF THE BOARD OF STUDIES MEETING OF PG & RESEARCH DEPARTMENT OF PHYSICS, CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) HELD ON MONDAY, OCTOBER17, 2022@2.00P.M at RESEARCH CENTRE

The following members attended the meeting:

- | | | |
|-----|---------------------------|----------------------|
| 1. | Dr.G. Maheswari | Chairperson&Head |
| 2. | Dr.T.R.Seshadri | Subject Expert |
| 3. | Dr.R.Nagalakshmi | Subject Expert |
| 4. | Dr.P.Muruganandam | Subject Expert |
| 5. | Dr.Sudhagar Pitchaimuthu | International Expert |
| 6. | Dr. Sony Punnose | Industrial Expert |
| 7. | Dr.Pushparani Micheal Raj | International Alumna |
| 8. | Dr.S.Gowri | Member |
| 9. | Dr.R.Meenakshi | Member |
| 10. | Dr.R.Gayathri | Member |
| 11. | Ms.S.Priya | Member |
| 12. | Ms.D.Devi | Member |
| 13. | Ms.A.MaryGirija | Member |
| 14. | Dr. K. Kannagi | Member |

15.	Dr. N.Manopradha	Member
16.	Ms.R.A.Kiruthika	Member
17.	Dr.B.Anitha	Member
18.	Dr.M.Kavimani	Member
19.	Dr.T.Noorunnisha	Member
20.	Dr .R.Mekala	Member
21.	Ms. M.Bowya	Student
22.	Ms. R.Ashrutha	Student

The leave of absence was granted to Dr. Dr.R.Nagalakshmi, Subject Expert, NIT, Trichirappalli and Dr.Pushparani Micheal Raj, International Alumna, Max Planck institute for Quantum Optics, Germany.

The Agenda for the meeting was as follows:

ITEM NO.BOS/07/01

Ratification to replace the title of Core Practical - I (CP), Physics Practical - I with Properties of Matter, Waves and Acoustics - Practical (22UPH1CC1P) of B.Sc., Physics Programme (2022-2023) batch and onwards in Semester - I and recommend to Academic Council, Cauvery College for Women(Autonomous),Tiruchirappalli-18.

ITEM NO.BOS/07/02

Ratification to replace the title of First Allied Course - I (AC), Mathematics - I with Calculus and Fourier series (22UPH1AC1), First Allied Course - II Mathematics - II with Algebra, Analytical Geometry of 3D & Trigonometry(22UPH1AC2) for B.Sc., Physics Programme (2022-2023) batch and onwards in Semester-I and recommend to Academic Council, Cauvery College for Women(Autonomous),Tiruchirappalli-18.

.ITEM NO. BOS/07/03

To consider and approve the Programme Structure (Six semesters) of B.Sc., Physics Programme for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

ITEM NO. BOS/07/04

To consider and approve the II Semester syllabus of B.Sc., Physics Programme for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

ITEM NO. BOS/07/05

Ratification to replace I Semester Core course -III , Electronics (19PPH1CC3) as Discipline Specific Elective Course- I (DSE) Microprocessor and Microcontroller(22PPH1DSE1A) of M.Sc., Physics for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

ITEM NO. BOS/07/06

To consider and approve the Programme Structure (Four Semesters) of M.Sc. Physics for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

ITEM NO. BOS/07/07

To consider and to approve the II Semester syllabus of M.Sc. Physics for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

ITEM NO. BOS/07/08

Appreciation of Board of Studies Members who contributed to prepare syllabus.

ITEM NO. BOS/07/09

Any other matter with the permission of the Chair.

Dr.G.Maheswari, Chairperson & Head, PG&Research Department of Physics extended the warm welcome to the members. Discussions based on the agenda were carried out.

1. RESOLUTION NO.BOS/07/01

Ratified the Core Practical - I (CP), Physics Practical– I with Properties of Matter, Waves and Acoustics – Practical (22UPH1CC1P) of B.Sc., Physics Programme (2022-2023) batch and onwards in Semester-I and recommended to Academic Council, Cauvery College for Women(Autonomous),Tiruchirappalli-18.

2. RESOLUTION NO.BOS/07/02

Ratified the First Allied Course- I (AC) of I Semester , Mathematics – I with Calculus and Fourier series (22UPH1AC1), First Allied Course- II of I Semester , Mathematics – II with Algebra,Analytical Geometry of 3D & Trigonometry(22UPH1AC2) for B.Sc., Physics Programme (2022-2023) batch and onwards and recommended to Academic Council, Cauvery College for Women(Autonomous),Tiruchirappalli-18.

3.RESOLUTION NO.BOS/07/03

Considered and approved the Programme Structure (Six semesters) of B.Sc. Physics for 2022 -2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

4.RESOLUTION NO.BOS/07/04

Considered and approved the II Semester syllabus of B.Sc., Physics Programme for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18

5.RESOLUTION NO.BOS/07/05

Ratified the I Semester Core course -III, Electronics (19PPH1CC3) as Discipline Specific Elective Course- I (DSE) of M.Sc., Physics for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18.

6.RESOLUTION NO.BOS/07/06

Considered and approved the programme Structure (Four Semesters) of M.Sc. Physics for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18 with the following changes.

- Title of Discipline Specific Elective - II, Numerical methods and C++ programming (22PPH2DSE2A) changed as Numerical methods and Python programming(22PPH2DSE2A).
- Title of Core Practical II, Physics Practicals - II (Microprocessor and C++ programming) (22PPH2CC2P) changed as Numerical methods and Python programming (22PPH2CC2P).

7. RESOLUTION NO.BOS/07/07

Considered and approved the II Semester syllabus of M.Sc., Physics for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirappalli-18 with the following changes.

Syllabus of C++ programming replaced with Python programming.

C++ programs are replaced with Python programs.

8. RESOLUTION NO.BOS/07/08

Dr.G.Maheswari,Chairperson thanked all the members for their suggestions and substantial inputs provided in the meeting.

There being no other matter,the meeting was concluded with a vote of thanks to the chair.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI – 620 018

PG AND RESEARCH DEPARTMENT OF PHYSICS



B.Sc., PHYSICS SYLLABUS

(2022-2023 Onwards)

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
TIRUCHIRAPPALLI-620 018
PG AND RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two – fold.

- To provide an outstanding and distinctive education to our undergraduate and postgraduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	<p style="text-align: center;">LEARNING ENVIRONMENT</p> <p>To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.</p>
PEO2	<p style="text-align: center;">ACADEMIC EXCELLENCE</p> <p>To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.</p>
PEO3	<p style="text-align: center;">EMPLOYABILITY</p> <p>To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.</p>
PEO4	<p style="text-align: center;">PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY</p> <p>To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.</p>
PEO5	<p style="text-align: center;">GREEN SUSTAINABILITY</p> <p>To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.</p>

PROGRAMME OUTCOMES FOR B.Sc PHYSICS PROGRAMME

PO NO.	Programme Outcome
	On completion of B.Sc Physics Programme, The students will be able to
PO 1	Domain Knowledge: Analyse, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO 2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues.
PO 3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO 4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO 5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc PHYSICS PROGRAMME

B.Sc PHYSICS CURRICULUM [2022-2023 Onwards]

PSO NO.	Programme Specific Outcomes Students of B.Sc Physics will be able to	POs Addressed
PSO1	Intensify the student academic capability, unique qualities and transferable skills which will give them opportunity to evolve as responsible citizens.	PO1, PO2, PO4
PSO2	Explain the fundamentals laws involved in physics.	PO1, PO5
PSO3	Understand the theory and consequence of the various physical occurrence.	PO1, PO2, PO3, PO5
PSO4	Carryout experiments to interpret the laws and concepts of Physics.	PO1, PO2, PO5
PSO5	Relate the theories learnt and the skills procured to solve enduring problems.	PO1, PO2, PO3, PO5



Cauvery College for Women (Autonomous)

PG & Research Department of Physics

B.Sc., Physics

LEARNING OUTCOME BASED CURRICULAM FRAMEWORK (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar-I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French – I	22ULF1						
	II	English Language Course- I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Properties of Matter, Waves and Acoustics	22UPH1CC1	5	5	3	25	75	100
				22UPH1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	Calculus and Fourier series	22UPH1AC1	4	3	3	25	75	100
				22UPH1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal – Universal Human Values	22UGVE	2	2	-	100	-	100
Total					30	22				700
II	I	Language Course-II (LC)	இடைக்கால இலக்கியமும் புதினமும்	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar –II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course- II(ELC)	Functional English for Effective Communication –II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Mechanics and Relativity	22UPH2CC2	5	5	3	25	75	100
				22UPH2CC2P	3	3	3	40	60	100
		Core Course -III (CC)	Introduction to Digital Electronics	22UPH2CC3	3	3	3	25	75	100
				22UPH2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
			Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
	Extra Credit Course			SWAYAM	As per UGC Recommendation					
Total					30	23				800

III	I	Language Course-III (LC)	காப்பியமும் நாடகமும்	22ULT3	5	3	3	25	75	100		
			Hindi Literature & Grammar -III	22ULH3								
			Prose, Textual Grammar and Vakyarachana	22ULS3								
			Intermediate French-I	22ULF3								
	II	English Language Course-III(ELC)	Learning Grammar Through Literature – I	22UE3	6	3	3	25	75	100		
	III	Core Course– IV (CC)	Thermal Physics and Statistical Mechanics	22UPH3CC4	6	6	3	25	75	100		
				Core Practical – III (CP)	Thermal Physics (P)	22UPH3CC3P	3	3	3	40	60	100
				Second Allied Course-I (AC)	Chemistry – I	22UPH3AC4	4	3	3	25	75	100
				Second Allied Course- II (AP)	Chemistry-I (P)	22UPH3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course- I (GEC)	Physics in Everyday Life	22UPH3GEC1	2	2	3	25	75	100		
			Basic Tamil - I	22ULC3BT1								
			Special Tamil - I	22ULC3ST1								
		Extra Credit Course	SWAYAM	As per UGC Recommendation								
Total					30	23				700		

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	பண்டைய இலக்கியமும் உரைநடையும்	22ULT4	6	3	3	25	75	100		
			Hindi Literature & Functional Hindi	22ULH4								
			Drama, History of Drama Literature	22ULS4								
			Intermediate French -II	22ULF4								
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature– II	22UE4	6	3	3	25	75	100		
	III	Core Course – V (CC)	Electricity, Magnetism and Electromagnetism	22UPH4CC5	6	6	3	25	75	100		
				Core Practical – IV (CP)	Electricity and Magnetism (P)	22UPH4CC4P	4	4	3	40	60	100
				Second Allied Course- III (AC)	Chemistry – II	22UPH4AC6	4	3	3	25	75	100
				Internship	Internship	22UPH4INT	-	2	-	25	75	100
	IV	Generic Elective Course- II (GEC)	Photography and Videography	22UPH4GEC2	2	2	3	25	75	100		
			Basic Tamil - II	22ULC4BT2								
			Special Tamil - II	22ULC4ST2								
		Skill Enhancement Course – I (SEC)	Web Designing (P)	22UPH4SEC1P	2	2	3	40	60	100		
	Extra Credit Course	SWAYAM	As per UGC Recommendation									
Total					30	25				800		

V	III	Core Course – VI (CC)	Optics	22UPH5CC6	6	6	3	25	75	100
		Core Practical – V (CP)	General and Electronics (P)	22UPH5CC5P	3	3	3	40	60	100
		Core Course – VII (CC)	Atomic and Nuclear Physics	22UPH5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Analog Electronics	22UPH5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Materials Science	22UPH5DSE1A	5	4	3	25	75	100
	B. Laser Physics		22UPH5DSE1B							
	C. Astrophysics and Cosmology		22UPH5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Physics concepts through Animation (P)	22UPH5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
Total				30	29					700
VI	III	Core Course – IX (CC)	Fundamentals of Microprocessor	22UPH6CC9	6	6	3	25	75	100
		Core Course – X (CC)	Classical and Quantum Physics	22UPH6CC10	5	5	3	25	75	100
		Core Practical –VI (CP)	Electronics and Microprocessor (P)	22UPH6CC6P	3	3	3	40	60	100
		Core Course – XI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. Communication Physics	22UPH6DSE2A	5	4	3	25	75	100
			B. Computational Physics	22UPH6DSE2B						
			C. Medical Physics	22UPH6DSE2C						
	Project	Project Work	22UPH6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total				30	28					700
Grand Total				180	150					4400

Project Work: 100 Marks

- i. Internal Component – 40 Marks
Review-I- 20 Marks
Review-II- 20 Marks
- ii. External Components - 60 Marks
Report Valuation - 40 Marks
Viva -Voce - 20 Marks

Core Papers : 11

Core Practical: 06

Project Work : 01

Internship : 01

List of Allied Courses:

First Allied Course – Mathematics

Second Allied Course – Chemistry

List of Generic Elective Courses:

Generic Elective Course -I

Physics in Everyday Life

Generic Elective Course -II

Photography and Videography

List of Skill Enhancement Courses:

Skill Enhancement Course - I

Web Designing (P)

Skill Enhancement Course - II

Physics concepts through Animation (P)

List of Major Based Electives:

Discipline Specific Elective -I

Materials Science/Laser Physics/Astrophysics and Cosmology

Discipline Specific Elective -II

Communication Physics/Computational Physics/Medical Physics

Extra Credit Course: Swayam Online Course

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 mark (i.e.30 marks)

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e.24 marks)

Internal Component (Theory)

Component	Marks
Library	5
Assignment	5
Seminar	5
CIA I &II	10
	25

Internal Component (Practical)

Component	Marks
Observation	5
Record	10
Continuous Performance in Practical	10
Model	15
	40

Internship Component

Internal Component	Marks	External Component	Marks
Communication Skill	5	Regularity	10
Presentation Skill	10	Problem Solving	10
		Participation and Hands-on training	20
Report Evaluation	10	Professional Attitude	15
		Report Writing	20
	25		75

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH1CC1	PROPERTIES OF MATTER, WAVES AND ACOUSTICS	CC-I	5	5

Course Objectives

- To build the conceptual understanding of materials with mathematical skills and reviews the prior knowledge of properties of matter.
- To study the basics of bending of beams and its applications.
- To study the concepts of viscosity and surface tension.
- To study concepts of waves and understand the acoustical phenomena.

Pre-requisites

- Knowledge about the concepts of elasticity and bending moment
- Fundamental knowledge of capillarity, viscosity of various liquids
- Develop the idea of formula, frequency of vibration and factors affecting the architectural acoustics

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Understand the basic ideas of Physical properties of different states of matter and sound	K1, K2
CO 2	Analyze the characteristics of elasticity, Simple Harmonic motion, viscosity, surface tension and the requisites of good acoustics	K3
CO 3	Evaluate the ideas of elasticity, Harmonic oscillations and excess pressure of surface tension in fluids and analyze the capillarity nature in liquids	K4
CO 4	Apply the concepts of moduli of elasticity, surface tension, viscosity, waves and acoustics	K3, K5
CO 5	Develop the idea of bending of beams, composition of Harmonic oscillation, empirical relations between surface tension and temperature, stokes formula, frequency of vibration of strings and factors affecting the architectural acoustics	K4

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	1	3	2	3	2	1
CO 2	3	3	2	3	1	3	2	3	2	2
CO 3	3	3	2	1	1	3	3	2	2	1
CO 4	3	3	3	2	2	3	3	2	3	1
CO 5	3	3	3	2	1	3	3	2	2	1

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ELASTICITY AND BENDING OF BEAMS Elasticity–Basic ideas-Work done in a strain- Relation between elastic constants and Poisson’s ratio-Twisting couple on a cylinder-Torsional pendulum (with and without weights)- Determination of rigidity modulus and moment of inertia -Bending of Beams-Bending moment- Depression for loaded end of a cantilever-Measurement of Young ‘s modulus- Non-uniform bending (pin and microscope method)- Uniform bending (mirror and telescope method)- Non-uniform and uniform bending of a beam-Koenig ‘s method.	22	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	HARMONIC OSCILLATIONS Periodic Motion- Simple Harmonic Motion and Harmonic Oscillator- Energy of a Harmonic Oscillator-Composition of Two Simple Harmonic Motions of Equal Periods in a Straight Line - Lissajous Figures - Damping Force- Damped Harmonic Oscillator-Examples of Damped Harmonic Oscillator-Power Dissipation-Quality Factor-Forced Harmonic Oscillator.	13	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	SURFACE TENSION Surface tension – Definition – Molecular forces – Measurement of angle of contact -Explanation of surface tension on kinetic theory –Excess pressure inside a curved liquid surface – Measurement of surface tension: capillary rise method - drop weight method - surface tension of solids and gases - empirical relations between surface tension and temperature.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	VISCOSITY Newtonian and non-Newtonian fluids - critical velocity and Reynolds Number - Viscosity – Streamlined and turbulent motion – Poiseuille’s formula and its correction–Terminal velocity-Stokes formula-Stoke’s method for coefficient of viscosity-Searle’s viscometer-Viscosity of gas- Meyer’s formula.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	WAVES AND ACOUSTICS Wave Motion- Plane Progressive Harmonic Wave- Intensity of a Wave-Transverse Waves in Stretched Strings- Modes of Transverse Vibrations of Strings- Longitudinal Waves in Rods and Gases -Wave Velocity and Group Velocity-Intensity of sound-Decibel and Bel-Loudness of sound- Reverberation - Factors affecting the architectural acoustics and their remedy-Sound distribution in auditorium-Requisites for good acoustics- Noise and its measurement- Noise reduction sound insulation.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	SELFSTUDY FOR ENRICHMENT: (Not to be included for External Examination) Elasticity of rubber-like materials-An Harmonic Oscillator-Surface tension of polymeric liquids - Viscosity of Nano fluids and highly viscous liquids-Water Waves: Ripple and Gravity Waves.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
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Text Books

1. Murugesan, R., (2012). *Properties of Matter and Acoustics*. (3rdedition) S.Chand& Co, New Delhi.
2. Newman, F.H., & Searle, V.H. L., (1961). *The General Properties of Matter*. (5thedition) E.Arnold, London.
3. Mathur, D.S., (2010). *Elements of Properties of Matter*. (1stedition) S. Chand & Company, New Delhi.
4. Khanna, D.R., & Bedi, R.S., (1969). *Textbook of Sound*. (7thedition) Atmaram and sons, New Delhi.
5. Subrahmanyam, N., & BrijLal., (2015). *Textbook of Sound*. (2nd edition) Vikas Publishing House, Chennai.

Reference Books

1. Murugesan, R., & KiruthigaSivaprasath, (2012). *Properties of Matter and Acoustics*. (3rd edition) S.Chand & Co, New Delhi.
2. Gulati, H.R., (1982). *Fundamentals of General Properties of Matter*. (1st edition) S.Chand& Co, New Delhi.
3. Saighal, R.L., (1998). *Text Book of Sound*. (2nd edition), S. Chand & Company, New Delhi.
4. Brown, R.C., (2005). *Mechanics and Properties of Matter*. (1st edition) Longmans Green and company, London.
5. David Halliday, Robert Resnick., (2013). *Fundamentals of physics*. (11th edition) Wiley Plus, United Kingdom.

Web References

1. <https://www.insula.com.au/physics/1279/L7.html>
2. <https://www.insula.com.au/physics/1279/L7.html>
3. <https://www.youtube.com/watch?v=CQGIgu-8dmA>
4. <https://hyperphysics.phy-astr.gsu.edu/hbase/pbuoy.html>
5. [https://kanchiuniv.ac.in/coursematerials/Physics%20book_Final%20\(1\).pdf](https://kanchiuniv.ac.in/coursematerials/Physics%20book_Final%20(1).pdf)

Pedagogy

Chalk and Talk, Assignment, Group discussion and Quiz

Course Designer

Dr.S.Gowri

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH1CC1P	PROPERTIES OF MATTER, WAVES AND ACOUSTICS (P)	CP-I	3	3

Course Objectives

- To help students to enhance their experimental skills.
- To gain hands-on experience with a variety of techniques.
- To learn the basic principles and procedures of laboratory work.

Pre-requisites

- Basic knowledge on usage of scientific apparatus.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Select the equipment and get the necessary accessories.	K1
CO 2	Demonstrate the use of equipment for various measures.	K2
CO 3	Construct the experiment by arranging and assembling the equipment.	K3
CO 4	Solve the physical quantity using the relevant formula after gathering accurate data through observations. Keep a detailed record of all laboratory activities.	K3
CO 5	Apply experimental approaches to correlate with physics theory to develop practical understanding.	K3

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	1	1	2	1	3	2	1	2	1
CO 2	2	3	2	2	2	3	3	1	2	1
CO 3	1	1	2	3	1	3	2	1	3	1
CO 4	2	3	3	3	2	1	3	1	3	2
CO 5	3	2	3	3	3	1	3	2	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (Any 8)	HOURS	COs	COGNITIVE LEVEL
<ol style="list-style-type: none">1. Young's modulus – Uniform bending (Pin and Microscope).2. Young's modulus – Cantilever depression (scale and telescope).3. Static Torsion: Determination of the Rigidity Modulus [N] of a material.4. Rigidity modulus – Dynamic method.5. Comparison of the co-efficient of viscosities of two liquids using the Burette method.6. Surface Tension and Interfacial Surface Tension – Drop weight method.7. Coefficient of viscosity of liquid – Variable pressure head.8. Surface Tension – Capillary rise method.9. Viscosity of liquid – Stoke's method.10. Sonometer – determination of frequency of tuning fork.11. Long focus convex lens - f, R, refractive index-determination.12. Air wedge – thickness of thin wire.	3 Hrs/Week	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Ouseph, C.C., Rao, U.J., Vijayendran, V., (2016). *Practical Physics and Electronics*. S.Viswanathan, Printers & Publishers Pvt Ltd., Chennai.

Reference Book

1. Prof.Namboodirippad, M.N., Prof..Daniel, P.A., (1982). *B.Sc., Practical Physics*. G.B.C. Publications, Cochin.

Web References

1. <https://vlab.amrita.edu/?sub=1&brch=280&sim=550&cnt=1>
2. <https://vlab.amrita.edu/index.php?sub=1&brch=280&sim=1518&cnt=4>
3. <http://amrita.olabs.edu.in/?sub=1&brch=5&sim=225&cnt=4>
4. <http://www.olabs.edu.in/?sub=1&brch=5&sim=224&cnt=2>

Pedagogy

Demonstration, practical sessions and viva voce

Course Designer

Ms.N.Manopradha

FIRST ALLIED COURSE-I (AC)
CALCULUS AND FOURIER SERIES
 (For B.Sc Physics & Chemistry)
 (2022-2023 and Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UPH1AC1/ 22UCH1AC1	CALCULUS AND FOURIER SERIES	ALLIED	4	3

Course Objective

- Explore the students with mathematical methods formatted for their major concepts and train them in basic Integrations.
- Analyze mathematical statements and expressions.
- Evaluate the fundamental concepts of Differentiation and Integration.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain the concepts of Calculus and Fourier series	K1,K2
CO2	Classify the problem models in the respective area.	K3
CO3	Solve various types of problems in the corresponding stream.	K3
CO4	Identify the properties of solutions in the core area.	K3
CO5	Discover the applications of Calculus and Fourier series.	K4

Mapping of CO with PO and PSO

os	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	2	2	3	2	2	2	2
CO3	3	2	2	2	2	3	2	2	2	2
CO4	3	2	2	2	2	3	2	2	2	2
CO5	3	2	2	2	2	3	2	2	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Successive Differentiation: The n^{th} derivative – Standard results – Method of splitting the fractional expressions into partial fractions - Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product (proof not needed) – A complete formal proof by induction (proof not needed) - Curvature- Circle, radius and center of curvature - Cartesian formula for the radius of curvature–Simple problems in all these.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Evaluation of integrals: Integration of Rational algebraic functions– Rule (a) – Rule (b) Integration of the form $\int \frac{lx + m}{ax^2 + bx + c} dx$ – Rule (c)- Integration of Irrational functions : Integration of the form $\int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx$ – Integration of the form $\int \frac{dx}{(x + p)\sqrt{ax^2 + bx + c}}$ - Integration of the form $\int \frac{dx}{a + b \cos x}$.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Reduction Formula: Properties of definite integrals –Reduction formula (when n is a positive integer) for 1] $\int e^{ax} x^n dx$ 2] $\int x^n \cos ax dx$ 3] $\int \sin^n x dx$ 4] $\int_0^{\frac{\pi}{2}} \sin^n x \cos^m x dx$ (without proof) and illustrations.</p>	13	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Double and Triple Integrals: Definition of the double integral-Evaluation of Double integral (Problems Only)- Change of order and evaluation of the double integral (Problems only).</p>	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Fourier Series: Definition of Fourier Series – Finding the Fourier Coefficients for a given periodic function with period 2π- Even and Odd functions –Half range Fourier series.</p>	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self-Study for Enrichment: (Not to be included for External examination) Radius of curvature when the curve is in Polar co-ordinates - (i) $\int \frac{dx}{ax^2 + bx + c}$ (ii) $\int \frac{dx}{\sqrt{ax^2 + bx + c}}$ - (1) $\int \cos^n x dx$ (2) $\int_0^{\frac{\pi}{2}} \cos^n dx$ -Triple Integrals in simple cases(Problems Only)- Development in cosine series - Development in sine series.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume I*. S. Viswanathan Pvt Limited.
2. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume II*. S. Viswanathan Pvt Limited.
3. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume III*. S. Viswanathan Pvt Limited.

UNIT-I	Chapter 3:Sections 1.1 to 1.6,2.1,2.2[1] Chapter 10:Sections 2.1 to 2.3 [1]
UNIT-II	Chapter 1:Sections 7.1,7.3,7.4,8(CASE II, CASE V), 9 [2]
UNIT-III	Chapter 1:Sections 11,13.1 to 13.5 [2]
UNIT-IV	Chapter 5:Sections 2.1,2.2,4 [2]
UNIT-V	Chapter 6:Sections 1to 4[3]

Reference Books

1. Sankarappan, S. Arulmozhi,G. (2006). Vector Calculus, Fourier series and Fourier Transforms. Vijay Nicole Imprints Private Limited.
2. Vittal, P.R. (2014). Allied Mathematics. Margham Publications.
3. Singaravelu, A. (2003). Differential Calculus and Trigonometry. R Publication.

Web Links

1. <https://www.youtube.com/watch?v=tBtF3Lr-VLk&t=64s>
2. <https://www.youtube.com/watch?v=Z4oSGuAZrZM>
3. https://www.youtube.com/watch?v=w6llnAQX_f8
4. <https://www.youtube.com/watch?v=LMcj8o0ERNE>
5. <https://www.youtube.com/watch?v=GAwQGCyWy0>
6. <https://www.youtube.com/watch?v=9X3gqehcFII>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr. P. Saranya
2. Ms.L.Mahalakshmi
3. Ms.P.Geethanjali

FIRST ALLIED COURSE-II (AC)
ALGEBRA, ANALYTICAL GEOMETRY OF 3D & TRIGONOMETRY
 (For B.Sc Physics & Chemistry)
 (2022-2023 and Onwards)

Semester I	Internal Marks: 25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UPH1AC2/ 22UCH1AC2	ALGEBRA, ANALYTICAL GEOMETRY OF 3D & TRIGONOMETRY	ALLIED	4	3

Course Objective

- Analyze the mathematical methods formatted for their major concepts.
- Evaluate the problems in Algebra and Trigonometry.
- Explain the basics of Three-Dimensional geometry.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain various notions in Algebra, Analytical Geometry of 3D & Trigonometry.	K1,K2
CO2	Identify the problem models.	K3
CO3	Apply the concepts of Algebra, Analytical Geometry of 3D & Trigonometry.	K3
CO4	Solve the given problems in the respective stream.	K3
CO5	Analyze the applications of the core area.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2	3	2	2	2	2
CO2	2	2	2	3	2	3	2	2	2	2
CO3	2	2	2	3	2	3	2	2	2	2
CO4	2	2	2	3	2	3	2	2	2	2
CO5	2	2	2	3	2	3	2	2	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
 “3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Series Expansion:</p> <p>Application of Binomial Theorem to summation of series – Approximate values – Summation of series by Exponential series - Summation of series by Logarithmic series (Formulae only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
II	<p>Matrices:</p> <p>Matrix-Special types of Matrices –Scalar multiplication of a matrix-Equality of matrices-Addition of matrices-Subtraction of matrices-Symmetric matrix-Skew symmetric matrix-Hermitian and Skew Hermitian matrix –Multiplication of matrix – Inverse matrix-Inner product-Solution of simultaneous equations-Rank of a matrix-Elementary transformation of a matrix-A system of m homogeneous linear equations in n unknowns-Linear dependence and independence of vectors-System of non-homogeneous linear equations - Eigen values and Eigenvectors.(Applications only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
III	<p>Three-Dimensional Geometry:</p> <p>The Sphere – Definition- The equation of a sphere when the center and radius are given-The equation of a sphere to find its center and radius- The length of the Tangent Plane from a point to the sphere – The Plane Section of a sphere – Equation of a circle on a sphere – Intersection of two spheres in a circle.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
IV	<p>Expansion of Trigonometric functions:</p> <p>Expansions of $\cos n\theta$ and $\sin n\theta$ - Expansion of $\tan(A + B + C + \dots)$ (omitting examples on formation of equations) –Powers of sines and cosines of θ in terms of functions of multiples of θ – Expansions of $\cos^n \theta$ when n is a positive integer – Expansions of $\sin^n \theta$ when n is a positive integer – Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ - The expansions of $\sin \theta$ and $\cos \theta$ to find the limits of certain expressions.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.

V	Hyperbolic functions: Hyperbolic functions – Relation between hyperbolic functions – Relations between hyperbolic functions and circular functions - Inverse hyperbolic functions.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
VI	Self-Study for Enrichment : (Not to be included for External examination) Series which can be summed up by the Logarithmic series - Simple applications of Matrices- The equation of the tangent plane to the sphere at a point. (Only problems) - Expansion of $\tan \theta$ in terms of powers of θ - Separation of real and imaginary parts of $\tanh(x+iy)$.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.

Text Books

1. Manichavasagam Pillai, T.K. Natarajan,T.& Ganapathy, K.S.(2015). *Algebra, Volume I*. S. Viswanathan Pvt Limited.
2. Manichavasagam Pillai, T.K. (2015). *Algebra, Volume II*. S.Viswanathan Pvt Limited.
3. Manichavasagam Pillai, T.K. & Natarajan,T. (2016). *A Text book of Analytical Geometry Part-II 3D*. New Gamma Publishers.
4. Manichavasagam Pillai, T.K. & Narayanan,S.(2013). *Trigonometry*. S. Viswanathan Pvt Limited.

UNIT-I Chapter 3:Sections 10,14[1]

Chapter 4:Sections 3,7,9 [1]

UNIT-II Chapter 2:Sections 1 to 16 [2]

UNIT-III Chapter 4:Sections 1-5,6,6.1,7,8 [3]

UNIT-IV Chapter 3:Sections 1 to 4, 4.1,5,5.1[4]

UNIT-V Chapter 4:Sections 1,2,2.1 to 2.3[4]

Reference Books

1. Arumugam,S.Issac,A. (2017). *Analytical Geometry 3D and Vector calculus*. New Gamma Publishing house.
2. Pandey, H.D. Khan, M.Q. & Gupta, B.N. (2011). *A Text Book of Analytical Geometry and Vector Analysis*. Wisdom Press.
3. Singaravelu, A. (2003). *Differential Calculus and Trigonometry*. R Publication.

Web Links

1. <https://www.youtube.com/watch?v=JayFh5EJHcU>
2. <https://www.youtube.com/watch?v=h5urBuE4Xhg>
3. <https://www.youtube.com/watch?v=59z6eBynJuw>
4. <https://www.youtube.com/watch?v=9DyPyJb2N9g>
5. <https://www.youtube.com/watch?v=HOk2XLeFPDk>
6. <https://www.youtube.com/watch?v=G1C1Z5aTZSQ>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr. P. Saranya
2. Dr.L.Mahalakshmi
3. Ms.P.Geethanjali

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22UGVE	UNIVERSAL HUMAN VALUES	Part IV	2	2

COURSE OBJECTIVES

1. To enable the learners to learn the values of love and compassion.
2. To foster the values of righteousness and service among the learners.
3. To enhance the morale of the learners by inculcating the values renunciation and peace.
4. To inspire the learners to practice the basic human values so as to make them become responsible citizens of the Nation.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

CO Number	CO Statement On the successful completion of this course, the students will able to	Cognitive Level
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth and Non - Violence	K2
CO3	Explain the value of Righteousness and Service	K3
CO4	Practice the values of Renunciation (sacrifice) & Peace	K4
CO5	Prioritize Human Values in their day today life	K5

Syllabus

Unit I: (6 Hours)

Love and Compassion

- **Introduction:** what is love? Forms of love for self, parent's family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore

Unit II: (7 Hours)

Truth and Non - Violence

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- **Introduction:** what is non-violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non-violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore

Unit III: (6 Hours)

Righteousness and Service

- **Introduction:** What is Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore

Unit IV: (6 Hours)

Renunciation (sacrifice) & Peace

- Introduction: what is renunciation? Renunciation and sacrifice. Self restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's needs, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace

Unit V: (5 Hours) Practicing human values

- What will learners learn/gain if they practice human values? What will learners lose if they Don't Practice human values?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies

Pedagogy: Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, and Case Study.

Course Designer: Dr.G.Mettilda Buvaneswari

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH2CC2	MECHANICS AND RELATIVITY	CC-II	5	5

Course Objectives

- To find the time of flight and impact velocity of a projectile that lands at a different height from that of launch.
- To explain motion along curved path.
- To illustrate the motion of rigid bodies and outline laws of gravitation.
- To make use of the ideas of frames of reference.

Pre-requisites

- A solid understanding of scalars and vectors.
- Fundamental concepts of physics.
- Basic understanding of Newtonian mechanics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Define the effects of a change in the position of any physical object or event.	K1
CO 2	Demonstrate laws and principles in physics.	K2
CO 3	Apply the mathematical tools in understanding physics.	K3
CO 4	Make use of simple concepts of mechanics in daily life.	K3
CO 5	Analyse the principles behind the mechanics of objects travelling at relativistic speeds.	K4

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	3	3	3	3	2	2	3
CO 2	2	3	3	3	3	3	3	2	2	3
CO 3	2	3	3	3	3	3	3	2	3	3
CO 4	2	3	3	2	3	3	2	2	2	3
CO 5	2	3	3	2	3	3	2	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>PROJECTILE, IMPACT AND FRICTION:</p> <p>Projectile – Path of a projectile is a parabola – Range of horizontal and inclined plane – Impulse of a force – Impulsive force – Impact between two smooth bodies – Laws of impact – Direct and oblique impacts – Impact of a smooth sphere on a smooth horizontal plane – Loss in kinetic energy due to direct and oblique impacts – Friction – Laws of friction – Angle of friction.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>MOTION ON A PLANE CURVE:</p> <p>Centripetal and centrifugal forces – Hodograph – Expression for normal acceleration by the hodograph method – Motion of cyclist along a curved path – Motion of a railway carriage round a curved track – Upsetting of a carriage on a curved level track – Motion of a carriage on a banked-up curve – Effect of the Earth's rotation on the value of the acceleration due to gravity – Variation of g with altitude.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>DYNAMICS OF RIGID BODIES AND GRAVITATION:</p> <p>Moment of Inertia - Kinetic energy and angular momentum of rotating body - Theorems of perpendicular and parallel axes – Acceleration of a body rolling down an inclined plane without slipping – Oscillations of a small sphere on a large concave smooth surface – Compound pendulum – Centre of suspension and centre of oscillation – Centre of percussion – Minimum period of a compound pendulum – Kater's pendulum.</p> <p>Newton's laws of gravitation – Kepler's laws of planetary motion – Deduction of Newton's law of gravitation – Determination of G – Boy's method.</p>	25	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>FRAMES OF REFERENCE:</p> <p>Frames of reference: Inertial and Non-Inertial – Galilean Transformation: Transformation of position, length, velocity and acceleration – Galilean invariance: Newton's law of motion, law of conservation of momentum and energy – Transformation equation for one frame of reference rotating with its axis with respect to an inertial frame – Coriolis force – Foucault's pendulum.</p>	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	SPECIAL THEORY OF RELATIVITY: Michelson-Morley experiment - concept of ether - Einstein's special theory of relativity - Lorentz transformation - time dilation - length contraction – proper length and proper time - simultaneity - relativistic mass, momentum, force and acceleration - equivalence of mass and energy ($E = mc^2$).	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Angular acceleration – Relation between the torque and angular acceleration of a rigid body – Conservation of energy – Conical pendulum – Moment of Inertia of a flywheel – Torsion pendulum.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanamurthi, M., and Nagarathinam, N., (2008). *Dynamics*. (8th edition) The National Publishing Company, Chennai.
2. Mathur, D.S., and Hemne, P.S., (2015). *Mechanics*. (Revised edition) S. Chand & Company Ltd., New Delhi.

Reference Books

1. Narayanamurthi, M., and Nagarathinam, N., (2002). *Statics, Hydrostatics and Hydrodynamics*. (3rd edition) The National Publishing Company, Chennai.
2. Murugesan, R., (2016). *Mechanics and Mathematical Physics*. (3rd edition) S. Chand & Company Ltd., New Delhi.
3. Brijilal Subramaniam, (1990). *Mechanics and Relativity*. (1st edition), Margham Publications.
4. Murugesan, R., and Kiruthiga Sivaprasath, (2016). *Modern Physics*. (18th edition) S. Chand & Company Ltd., New Delhi.

Web References

1. <https://courses.lumenlearning.com/suny-osuniversityphysics/chapter/4-3-projectile-motion/>
2. <http://www.jbsw.shikshamandal.org/wp-content/uploads/2016/07/2-Gravitation.pdf>
3. <https://vlab.amrita.edu/?sub=1&brch=280&sim=518&cnt=1>
4. <https://www.youtube.com/watch?v=wD7C4V9smG4>
5. <https://www.youtube.com/watch?v=TgH9KXEQ0YU>

Pedagogy

Chalk and Talk, Assignment, Group discussion and Quiz

Course Designer

Dr.N.Manopradha

Semester II	Internal Marks: 40	External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH2CC2P	MECHANICS AND DIGITAL ELECTRONICS (P)	CP-II	3	3

Course Objectives

- To give students a foundational understanding of how to measure various physical quantities.
- To use scientific equipment to estimate various physical properties.
- To investigate the basic idea behind digital technology.
- To construct basic logic gates using distinct components.

Pre-requisites

- Basic knowledge on usage of scientific apparatus.

Course Learning Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO1	Select the equipment and get the necessary accessories.	K1
CO2	Explain the experiment's fundamental concepts.	K2
CO3	Make use of fundamental principles and experiment circumstances.	K3
CO4	Experiment with the laboratory norms.	K3
CO5	Examine the applications.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	1	1	2	1	3	2	1	2	1
CO2	2	3	2	2	2	3	3	1	2	1
CO3	1	1	2	3	1	3	2	1	3	1
CO4	2	3	3	3	2	1	3	1	3	2
CO5	3	2	3	3	3	1	3	2	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation

Syllabus

LIST OF EXPERIMENTS (Any 8)	HOURS	COs	COGNITIVE LEVEL
1. CRO – Study of wave forms – Lissajous figures. 2. Compound pendulum – g and k. 3. Moment of Inertia – Torsional Pendulum. 4. Young’s modulus – Non-Uniform bending (Pin and Microscope). 5. Young’s modulus – Uniform bending (Optic lever). 6. Verification of Laws of Transverse Vibrations [I & II laws] in a stretched string using a sonometer. 7. Verification of Logic gates. 8. Construction of Half and Full adder. 9. NAND as UBB. 10. NOR as UBB. 11. Spectrometer – μ of solid prism. 12. Concave lens – Focal length determination.	3 Hrs/Week	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Ouseph, C.C., Rao, U.J., Vijayendran, V., (2016). *Practical Physics and Electronics*. S.Viswanathan, Printers & Publishers Pvt Ltd., Chennai.

Reference Book

1. Prof.Namboodirippad, M.N., Prof.Daniel, P.A., (1982). *B.Sc., Practical Physics*. G.B.C. Publications, Cochin.

Web References

1. <https://vlab.amrita.edu/?sub=1&brch=280&sim=210&cnt=2>
2. <https://vlab.amrita.edu/?sub=1&brch=280&sim=1509&cnt=1>
3. <https://de-iitr.vlabs.ac.in/exp/truth-table-gates/simulation.html>
4. <https://amrita.olabs.edu.in/?sub=1&brch=6&sim=244&cnt=4>

Pedagogy

Demonstration, practical sessions and viva voce

Course Designer

Dr.N.Manopradha

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UPH2CC3	INTRODUCTION TO DIGITAL ELECTRONICS	CC-III	3	3

Course Objectives

- To learn different numbers systems and their conversion from one to another.
- To understand the working of logic gates and to use Boolean equations and Karnaugh maps to simplify and check the output of logic circuits.
- To know the uses of encoders, decoders, multiplexers and demultiplexers.
- To understand the working of flip-flops and to analyze sequential circuits.

Pre-requisites

- Basic knowledge on binary number system.
- Fundamental ideas on logic gates.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Define number system and convert one number system to other number systems and to select the most suitable one for specific application.	K1
CO 2	Interpret logic circuits and thereby develop equivalent circuits.	K2
CO 3	Develop combinational logic circuits.	K3
CO 4	Examine different arithmetic and logic functions with appropriate selection of inputs and check the possible outputs for arithmetic and logic circuits.	K4
CO 5	Simplify Boolean expressions and design logic circuits.	K4

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	2	3	3	2	2	2
CO 2	2	2	2	2	2	3	3	2	3	3
CO 3	2	3	3	2	2	3	3	3	3	3
CO 4	2	2	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	NUMBER SYSTEMS AND CODE: Binary number system – Binary to decimal conversion – Decimal to binary conversion – Octal numbers – Conversion of octal numbers – Hexadecimal numbers – Conversion of hexadecimal numbers – The ASCII code – The Gray code.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	ARITHMETIC CIRCUITS: Binary addition – Binary subtraction – Unsigned binary numbers – Sign – Magnitude numbers – 2's complement representation – 2's complement arithmetic – Half and Full adder – Half and Full subtractor.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	DIGITAL LOGIC AND LOGIC CIRCUITS: Basic gates – NOT, OR, AND – EX-OR gates – Universal logic gates – NOR, NAND – Boolean laws and Demorgan's theorems – Sum-of-Products method – Truth table to Karnaugh map – Pairs, Quads, and Octets – Karnaugh map simplifications – Don't-care conditions.	11	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	COMBINATIONAL LOGIC CIRCUITS: Multiplexer – 4 to 1 multiplexer – Demultiplexer – 1 to 4 demultiplexer – Decoder – 2 to 4 decoder – BCD to seven segment decoder – Encoders – Decimal to BCD encoder.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	FLIP – FLOPS: RS flip-flops – Clocked RS flip-flops – Edge-triggered RS flip flops – JK flip – D flip-flops – T flip flops – Applications of flip-flops.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) BCD code – Subtraction by 1's and 2's complement method – Solving Boolean Expressions using Karnaugh Map (2,3 and 4 variables) – 4-bit adder/subtractor – Introduction to shift registers – Basic Shift Register Operations.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Donald P Leach, Albert Paul Malvino, Goutam Saha, (2011). *Digital Principles and Applications*. (7th edition) Tata McGraw – Hill Publishing Company Limited, New Delhi.
2. Jain,R.P, (2009). *Modern Digital Electronics*. (4th edition) Tata McGraw Hill Education Private Limited, Noida.
3. Vijayendran, V, (2003). *Digital fundamentals*. (1st edition) S. Viswanathan Printers and Publishers Pvt. Ltd, Chennai.
4. Virendra Kumar, (2007). *Digital electronics Theory and Experiments*. (2nd edition) New Age International Publishers, Chennai.

Reference Books

1. James W. Bignel, (2007). *Digital Electronics*. (5th edition) Cengage learnings, Uttar Pradesh.
2. MandalS.K, (2017). *Digital Electronics Principles & Applications*. (1st edition) McGraw Hill Education, Karnataka.
3. Thomas L. Floyd, (2015). *Digital Fundamentals*. (11th edition) Pearson Education, Bengaluru.
4. Kothari,D.P., J.S. Dhillon, (2016). *Digital Circuits and Design*. (1st edition) Pearson Education, Bengaluru.

Web References

1. <https://circuitglobe.com/rs-flip-flop.html>
2. <http://hyperPhysics.phy-astr.gsu.edu/hbase/Electronic/jkflipflop.html>
3. <https://circuitglobe.com/half-adder-and-full-adder-circuit.html>
4. <https://programmerbay.com/construct-4-to-1-multiplexer-using-logic-gates/>
5. <https://www.electronicshub.org/demultiplexerdemux/>
6. <https://www.elprocus.com/designing-of-2-to-4-line-decoder/>
7. <https://www.electricaltechnology.org/2018/05/bcd-to-7-segment-display-decoder.html>

Pedagogy

Chalk and Talk, Assignment, Group discussion and quiz

Course Designer

Ms.D.Devi

ALLIED COURSE – III

(For Physics)

ODE, PDE, LAPLACE TRANSFORMS AND VECTOR ANALYSIS

(2022-2023 Onwards)

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22UPH2AC3	ODE, PDE, LAPLACE TRANSFORMS AND VECTOR ANALYSIS	ALLIED	4	3

Course Objective

- Explain the basics of Ordinary Differential Equations.
- Emphasize in the field of Partial Differential Equations.
- Explore the mathematical methods formatted for major concepts.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Explain various notions in ODE, PDE, Laplace transforms & Vector Analysis.	K1, K2
CO2	Classify the problem models in the respective area.	K3
CO3	Identify the properties of solutions in the core area.	K3
CO4	Solve various types of problems in the corresponding stream.	K3
CO5	Analyze the applications of the core area.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	3	2	3	3
CO2	3	2	2	2	2	2	3	2	3	3
CO3	3	2	2	2	2	2	3	2	3	3
CO4	3	2	2	2	2	2	3	2	3	3
CO5	3	2	2	2	2	2	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Ordinary Differential Equations: Equations of the first order but of higher degree – Type A: Equations solvable for $\frac{dy}{dx}$ - Type B: Equations solvable for y - Equations solvable for x-Clairaut's Form (simple cases only). Linear equations with constant coefficients: Definitions – The operator D- Complementary function of a linear equation with constant co-efficients - Particular integral: General method of finding P.I- Special methods for finding P.I.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Partial differential equations: Classification of integrals–Derivation of Partial differential equations: By elimination of constants - By elimination of arbitrary function-Lagrange's method of solving the linear equation-Special methods –Standard forms-I,II,III,IV(Geometrical Meaning is not needed)-(only problems in all the above) – (No proof needed for any formula).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Laplace Transforms: Laplace Transforms – Definition -Sufficient conditions for the existence of Laplace transform-Basic results-Laplace transform of periodic functions-Some general theorems-Evaluation of integrals using Laplace transform.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Inverse Laplace Transform: The Inverse Transform –Modification of results obtained in finding Laplace transforms to get the inverse transforms of functions- Laplace Transforms to solve ordinary differential equations with constant co-efficients.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Vector Differentiation: Limit of a vector function-continuity of vector functions-Derivative of a vector function-Some Standard Results-Geometrical significance of vector differentiation-Physical application of derivatives of vectors - partial derivative of a vector function. Gradient, Curl and Divergence: Scalar and Vector point functions – Gradient of a scalar point function-Directional derivative of a scalar point function-Equations of tangent plane and normal line to a level surface. Divergence and curl of a vector point function: Definition- Curl of a vector point function- irrotational vector.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self -Study for Enrichment: (Not included for End Semester Examination) Equations that do not contain x and y for explicitly- Equations reducible to the standard form - Piecewise continuity - Laplace Transforms to solve ordinary differential equations with variable co-efficients - Physical interpretation of divergence of a vector - Physical interpretation of curl of a vector-Vector identity.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

1. Narayanan. S, Manicavachagam Pillai. T. K. (2016). *Differential Equations and its applications*. S. Viswanathan Pvt Limited.
2. Vittal. P. R, Malini. V. (2016). *Vector Analysis*. Margham Publications.

Chapters and Sections

UNIT-I Chapter 4: Sections 1-3 [1]

Chapter 5: Sections 1-4 [1]

UNIT-II Chapter 12: Sections 1-5.4 [1]

UNIT-III Chapter 9: Sections 1-5 [1]

UNIT- IV Chapter 9: Sections 6-8 [1]

UNIT- V Chapter 1: Pages (1-24,26-35) [2]

Reference Books

1. Narayanan. S, Manicavachagam Pillai. T. K. (2003). *Calculus, Vol. III*. S.Viswanathan Pvt Limited.
2. Arumugam Isaac. (2014). *Differential Equations and Applications*. New Gamma Publishing House.
3. Sankarappan. S, Arulmozhi. G. (2006). *Vector Calculus, Fourier Series and Fourier Transforms*. Vijay Nicole Imprints Private Limited.

Web References

1. https://www.youtube.com/watch?v=OM01KTc0_9w
2. <https://youtu.be/zlfsh1SyH58>
3. <https://www.youtube.com/watch?v=dCVBZbebl8Y>
4. <https://www.youtube.com/watch?v=Y8GXpS31CGI>
5. <https://www.youtube.com/watch?v=IVJjm5FE4x8>
6. <https://www.youtube.com/watch?v=FXTt6Sa79mI>
7. https://www.academia.edu/35399426/CHAPTER_1_VECTOR_DIFFERENTIATION

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment.

Course Designer

1. Dr.L.Mahalakshmi

Semester:II	InternalMarks:100			
COURSECODE	COURSETITLE	CATEGORY	HRS/ WEEK	CREDI TS
22UGEVS	ENVIRONMENTAL STUDIES	ABILITY ENHANCEMENTCOMP ULSORYCOURSE	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classification of various types of ecosystem with its structure and function.	K2
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low) Correlation

“2” – Moderate (Medium)

Correlation “3”–Substantial (High)Correlation

“-“indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	<p>Natural Resources: Renewable and non-renewable resources:</p> <p>a. Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.</p> <p>b. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflict over water, dams benefits and problems.</p> <p>c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.</p> <p>d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.</p> <p>e. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.</p> <p>f. Land resources: Land resources, land degradation, man-induced Landslides, soil erosion and desertification.</p> <p>g. Role of an individual in conservation of natural resources.</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	<p>Ecosystems</p> <p>Concept, Structure and function of an ecosystem. Producers, consumers and decomposers</p> <p>Energy flow in the ecosystem and Ecological succession.</p> <p>Food chains, food webs and ecological pyramids</p> <p>Introduction, types, characteristic features, structure and function of the following ecosystem: -Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, nestuaries)</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3, K4

IV	<p>Bio diversity and Environmental Pollution Introduction,types and value of biodiversity.India as a mega diversity nation. Hot-spots of biodiversity.Threatsto biodiversity:habitatloss,poaching of wildlife,man-wildlife conflicts.Endangered and endemic species of India.Conservation of biodiversity:In-situand Ex-situ conservation of biodiversity.Definition,Causes,effects and control measures of :Air Pollution, Water Pollution, Soil Pollution, Noise pollution,Nuclear hazards,Solid waste Management:Causes,effects and control measures of urban and industrial wastes. E-Waste Management:Sources and Types of E-waste.Effect of E-waste on environment and humanbody.Disposal of E-waste,Advantages of Recycling E-waste.Role of an individual inprevention of pollution.Disastermanagement:floods,earthquake , cyclone and landslides.</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3, K4
V	<p>Social Issues and the Environment Water conservation,rain water harvesting,water shedmanagement. Climate change,global warming, acid rain,ozone layer depletion, Waste land reclamation. Environment Protection Act Wildlife Protection Act. Forest Conservation Act. Population explosion–Family Welfare Programmes Human Rights-Value Education.HIV/ AIDS- Women and Child Welfare. Role of Information Technology in Environment and human health.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt Ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480p
4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P. Cooper, T.H. Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay.
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. B. Thamilmaraiselvi

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI – 18

PG & RESEARCH DEPARTMENT OF PHYSICS



M.Sc., PHYSICS SYLLABUS

(2022-2023 Onwards)

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS),
TRICHY-18.**

PG AND RESEARCH DEPARTMENT OF PHYSICS

VISION

To establish a substratum for excellence and creation of knowledge by igniting the essence of learning physics and exploring its area of research with novel ideas.

MISSION

Our mission is two – fold.

- To provide an outstanding and distinctive education to our undergraduate and postgraduate students.
- To expand our research enterprises via centers and institutes to achieve national and international prominence in strategic research areas.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	STATEMENTS
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc PHYSICS PROGRAMME

PO NO.	Programme Outcome On completion of M.Sc Physics Programme, The students will be able to
PO 1	Problem Analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO 2	Scientific Skills: Create and apply advanced techniques and tools to solve the societal environmental issues.
PO 3	Environment and sustainability: Ascertain eco- friendly approach for sustainable development and inculcate scientific temper in the society.
PO 4	Ethics: Imbibe ethical and social values aiming towards holistic development of learners.
PO 5	Lifelong learning: Instil critical thinking, communication, initiative which potentially leads to higher rates of employment and educational fulfillment.

PROGRAMME SPECIFIC OUTCOME FOR M.Sc PHYSICS PROGRAMME

M.Sc PHYSICS CURRICULUM (2022-2023 onwards)

PSO NO.	Programme Specific Outcomes Students of M.Sc Physics will be able to	POs Addressed
PSO 1	Demonstrate proficiency in the mathematical concepts needed for a proper understanding of Physics	PO1, PO2, PO5
PSO 2	Understand the basic concepts of Physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.	PO2, PO5
PSO 3	Learn numerous numerical problem-solving approaches and the fundamentals of curve fittings.	PO1, PO2
PSO 4	Learn about microprocessors and microcontrollers, as well as practical microprocessor programming abilities	PO1, PO2
PSO 5	Provide students with broad theoretical and practical knowledge in all specialization of Physics with required qualitative and quantitative techniques.	PO1, PO2', PO5



Cauvery College for Women (Autonomous)
PG & Research Department of Physics
M.Sc., Physics

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs./ week	Credits	Exam			Total	
						Hrs.	Marks			
							Int.	Ext.		
I	Core Course– I (CC)	Mathematical Physics	22PPH1CC1	6	5	3	25	75	100	
	Core Course – II (CC)	Classical Dynamics and Relativity	22PPH1CC2	6	5	3	25	75	100	
	Core Course –III (CC)	Quantum Mechanics - I	22PPH1CC3	6	5	3	25	75	100	
	Core Practical - I (CP)	General Physics and Electronics - I (P)	22PPH1CC1P	6	5	3	40	60	100	
	Discipline Specific Elective Course-I (DSE)	Microprocessor and Microcontroller	22PPH1DSE1A	6	3	3	25	75	100	
			Non – Destructive Evaluation Techniques							22PPH1DSE1B
			Astrophysics							22PPH1DSE1C
Total				30	23	-	-	-	500	
15 Days INTERNSHIP during Semester Holidays										
II	Core Course– IV (CC)	Electromagnetic Theory	22PPH2CC4	6	5	3	25	75	100	
	Core Course – V (CC)	Quantum Mechanics -II	22PPH2CC5	6	5	3	25	75	100	
	Core Choice Course– I (CCC)	Electronics	22PPH2CCC1A	6	4	3	25	75	100	
		Nonlinear Dynamics	22PPH2CCC1B							
		Spectroscopy	22PPH2CCC1C							
	Core Practical - II (CP)	Microprocessor and Python Programming (P)	22PPH2CC2P	6	5	3	40	60	100	
	Discipline Specific Elective Course-II (DSE)	Numerical Methods and Python Programming	22PPH2DSE2A	6	3	3	25	75	100	
			Physics of Sensor and Transducer							22PPH2DSE2B
			Material Characterization and Measurement Techniques							22PPH2DSE2C
	Internship	Internship	22PPH2INT	-	2	-	25	75	100	
Extra Credit Course	SWAYAM	As per UGC Recommendation								
Total				30	24	-	-	-	600	

III	Core Course– VI (CC)	Statistical Mechanics	22PPH3CC6	6	5	3	25	75	100
	Core Course – VII (CC)	Solid State Physics	22PPH3CC7	5	5	3	25	75	100
	Core Choice Course– II (CCC)	Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		Communication Electronics	22PPH3CCC2B						
		Physics of Semiconductor Devices	22PPH3CCC2C						
	Core Practical - III (CP)	General Physics and Electronics - II (P)	22PPH3CC3P	6	5	3	40	60	100
	Discipline Specific Elective Course-III (DSE)	Crystal Growth and Thin Film Physics	22PPH3DSE3A	5	3	3	25	75	100
		Physics for Competitive Examinations	22PPH3DSE3B			2	-	100	
		Weather Forecasting	22PPH3DSE3C			3	25	75	
	Generic Elective Course -I (GEC)	Science of Materials	22PPH3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600
IV	Core Course–VIII (CC)	Nuclear and Particle Physics	22PPH4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	Nonlinear Optics	22PPH4CCC3A	6	4	3	25	75	100
		Nanophysics	22PPH4CCC3B						
		Space Physics	22PPH4CCC3C						
	Core Practical - IV (CP)	Electronics (P)	22PPH4CC4P	6	5	3	40	60	100
	Generic Elective Course-II (GEC)	Trouble Shooting of Home Appliances	22PPH4GEC2	3	2	3	25	75	100
	Project	Project Work	22PPH4PW	9	5	-	-	100	100
	Total				30	21	-	-	-
Grand Total				120	92	-	-	-	2200

Courses & Credits for M.Sc., Physics

Sl. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course – (CC)	8	40	800
2.	Core Choice Course– (CCC)	3	12	300
3.	Core Practical - (CP)	4	20	400
4.	Discipline Specific Elective- (DSE)	3	9	300
5.	Generic Elective Course - (GEC)	2	4	200
6.	Project	1	5	100
7.	Internship	1	2	100
	Total	22	92	2200

- Project : 100
- Marks Dissertation : 80 Marks
- Viva Voce : 20 Marks
- Core Papers : 08
- Core Choice Course : 03
- Core Practical : 04
- Discipline Specific Elective : 03
- Generic Elective Course:02
- Project : 01
- Internship : 01

Note:

1. Theory Internal 25 marks External 75 marks
2. Practical ” 40 marks ” 60 marks
3. Separate passing minimum is prescribed for Internal and External
 - a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
 - b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e. 30 mark)
 - c) The passing minimum not less than 50% in the aggregate.

Internal Component (Theory)

Component	Marks
Library	5
Assignment	5
Seminar	5
CIA I &II	10
	25

Internal Component (Practical)

Component	Marks
Observation	5
Record	10
Continuous Performance in Practical	10
Model	15
	40

INTERNSHIP COMPONENTS

Internal components	Marks	External components	Marks
Communication skill	5	Regularity	10
Presentation skill	10	Problem solving	10
		Participation and Hands-on training	20
Report evaluation	10	Professional attitude	15
		Report writing	20
Total	25		75

SEMESTER -I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH1CC1	MATHEMATICAL PHYSICS	CC - I	6	5

Course Objectives

- To provide a strong mathematical foundation in vector calculus, matrices and differential equations
- To learn complex variables and residue theorem technique to solve real integrals appearing in physics problems
- To understand basics of Fourier Transform and Laplace Transform.
- To demonstrate competence with the basic ideas of linear algebra including concepts of linear systems, theory of matrices, , eigenvectors and diagonalization.
- To enhance problem solving skills and to give the ability to formulate, interpret and draw inferences from the mathematical solutions.

Pre-requisites

- Strong Foundation of vector Analysis.
- Understand and appreciate the properties of complex variable.
- Commendable knowledge of special functions to apply physics problems.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Remember and Understand the various mathematical concepts used in physics.	K1, K2
CO 2	Analyze mathematical tools like vector, matrix, group theory, complex integration, Fourier and Laplace series, special function will prepare the student to solve ODE; PDE's which model physical phenomena.	K3
CO 3	Evaluate the vector, linear, simultaneous and differential equations which will be necessary to pursue other areas in physics.	K4
CO 4	Apply mathematical methods to predict the problems in classical physics, statistical physics and quantum mechanics as well as electrodynamics.	K5
CO 5	Solve the physical problems using mathematical techniques.	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	1	2	1	1	3	3	2	2	2
CO 2	3	1	1	1	1	3	1	2	2	2
CO 3	3	1	1	1	1	3	3	1	2	2
CO 4	3	1	3	1	1	1	3	2	2	2
CO 5	3	1	2	1	1	3	3	2	3	1

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation;
“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Vector Analysis Vector integration – Line integral– Surface integral – Flux – Volume integral – Green’s theorem – Stokes’ theorem – Divergence theorem – Orthogonal curvilinear coordinates – Unit vectors in curvilinear coordinate system – The gradient, divergence, curl and Laplacian in cylindrical and spherical polar coordinates.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>Matrix and Group theory Characteristic equation of a matrix – Matrix algebra – Rank of a Matrix – System of linear equations – Types of matrix – Inverse of a matrix – Eigenvalues and eigenvectors – Cayley–Hamilton theorem – Reduction of a matrix to diagonal form – Jacobi method. Introduction to Group Theory – Group Multiplication Table – Cyclic Group – Subgroup – Cosets – Classes – Invariant Subgroup – Homomorphism and Isomorphism – Reducible and Irreducible Representation – Formation of character table of C_{2v}– $SU(2)$ and $SO(3)$</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Complex Variables Complex functions and variables – Condition for a function to be analytic– Complex integration – Cauchy’s theorem – Taylor expansion – Laurent series – Cauchy’s residue theorem – Computations of residue – Evaluation of integrals using residues.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Fourier and Laplace’s Integral Transforms Fourier’s Transform– Infinite Fourier Sine and Cosine Transforms– Properties of Fourier’s Theorem– Finite Fourier sine and cosine transforms. Laplace transforms– Properties of Laplace Transforms– Convolution Theorem– Evaluation of Inverse Laplace Transforms by Convolution Theorem– Evaluation of Laplace Transform using Differential Equations.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Special Functions Solution of Differential Equations – Legendre, Hermite and Bessel Differential Equations using Power Series method – Generating Function, Rodrigues Formula, Recurrence relation, Orthogonality relations.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not included for End Semester Examinations) Exact differential –Sylvester’s theorem–Formation of character table of C_{3v}– Elementary ideas in Lie Groups and Lie Algebras –Cauchy’s integral formula– Simple applications of Fourier Transforms– Laguerre differential equation.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Gupta.B.D., (2015). *Mathematical Physics*. (2nd Edition)Vikas Publishing House, Mumbai.
2. Satya Prakash., (2014). *Mathematical Physics*.(1st Edition) Sultan chand & sons, Newdelhi.
3. Sexena.A.K., (2015). *Mathematical Physics*.(1st Edition) Narosa Pub, Newdelhi.
4. Joshi.A.W., (2006). *Matrices and Tensors in Physics*. (4th Edition)New Age, Newdelhi.
5. MurraySpiegel., (2009). *Schaum Series of Complex. (2nd Edition) Analysis* .McGraw-Hill, Newyork.
6. Balakrishnan.V., (2018). *Mathematical Physics with Applications*. Indian Academy of Science, Bangalore.

Reference Books

1. Dass, H.K., & Rama Verma., (2018).*Mathematical Physics*.(1st Edition) S.Chand & Co, New Delhi.
2. Pipes, L.A.,& Harvill,L.R., (1970).*Mathematical Physics for Engineering*.(3rd Edition) McGraw-Hill, Newyork.

Web References

1. <https://nptel.ac.in/courses/115/106/115106086/>
2. <https://nptel.ac.in/courses/115/103/115103036/>
3. <https://www.classcentral.com/course/swyam-mathematical-methods-in-physics-1-23045>

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Dr.R.Gayathri

SEMESTER - I	INTERNAL MARKS : 25	EXTERNAL MARKS : 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH1CC2	CLASSICAL DYNAMICS AND RELATIVITY	CC - II	6	5

Course Objectives

- To acquire Basic Knowledge about Lagrangian formulation
- To expose the students to the fundamentals of Hamiltonian equation.
- To demonstrate knowledge and understanding of the fundamental concepts of Rigid body dynamics
- To acquire knowledge of real time problems in macroscopic view and applying it to the microscopic level
- To develop critical thinking and problem solving skills

Pre-requisites

- Knowledge about Lagrange's equation
- Knowledge about Motion under a central force
- Fundamental knowledge of physical concepts , mathematical methods of classical mechanics

Course Outcome and Cognitive Level Mapping:

CO Number	CO Statement On the successful completion of course, the student will be able to	Cognitive Level
CO 1	Remember and Understand the primary idea and principle governing the concept of tensor as well as the discrete and continuous mechanical systems related concepts in classical mechanics.	K1,K2
CO 2	Analyze the constraints on mechanical systems and Interpret the importance of concepts such as generalized coordinates.	K3
CO 3	Evaluate the ideas of rigid body dynamics and kinematics as well as the central force acting on the objects.	K4
CO 4	Apply the Lagrangian and Hamiltonian formulation of classical mechanics,poisson brackets and canonical transformations are used in order to simplify the methods to be used in solving physics problems.	K5
CO 5	Create conclusions about classical dynamics, including matrix generalization and special relativity.	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	1	3	3	2	2	2	2
CO 2	3	3	2	1	3	3	2	2	2	2
CO 3	3	3	2	1	3	3	2	2	2	2
CO 4	3	3	2	1	3	3	2	2	2	2
CO 5	3	3	2	1	3	3	2	2	2	2

“1”-Slight (Low) Correlation

“3”- Substantial (High) Correlation

“2”-Moderate (Medium) Correlation

“-“indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Lagrangian Formalism: Mechanics of a system of particles – Conservation of linear momentum, Angular momentum and Energy-constraints – Classification of constraints – Degrees of freedom – Generalized coordinates – Principle of virtual work – D’Alembert’s principle – Lagrange’s equation of motion – Applications – Linear harmonic oscillator – Simple Pendulum – Compound Pendulum – Atwood’s Machine.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Hamilton’s Formulation: Phase space and motion of the system -Hamiltonian function – Hamiltonian Variation principle – Hamilton’s canonical equations of motion – physical significance of H – advantages of Hamiltonian approach – Applications of Hamilton’s equations of motion – Simple Pendulum – Principle of least action- Canonical Transformations- Infinitesimal constant transformations- Poisson brackets -Equation of motion in Poisson brackets and its relation	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Central Force Problems: Equations of motion and first integrals - The equivalent One - Dimensional problem and General features of orbits - The Kepler problem: Inverse square law of force-the Laplace-Runge - Lenz Vector – Scattering in a central force field - Scattering in a Problem to laboratory coordinates	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Rigid Body Dynamics and Oscillatory Motion: Euler angles - Moments and Products of inertia - Euler’s equations –Symmetric top under the action of gravity -Applications-Theory of small Oscillations and normal modes-Frequencies of free Vibration and normal coordinates-Linear triatomic molecule.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Tensor and Relativistic Mechanics: Occurrence of tensor in physics-Kronecker delta-Dummy and Free index-Covariant and Contravariant-Inner and Outer Product-Quotient Law-Basic Postulates of special theory of relativity-Lorentz transformationsin real four dimensional spaces, force and energy equations in relativistic mechanics- Lagrangian formulation of relativistic mechanics-Hamiltonian formulation of relativistic mechanics	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Superiority of Lagrangian approach over Newtonian approach-Application of Lagrangian and Hamiltonian: motion in a Uniform gravitational field-Advantage of Hamiltonian approach-Advantage of Canonical transformation-Relation between Lagrange and Poisson brackets-One dimensional harmonic oscillator- Special theory of relativity- Relativistic Generalization of Newton’s laws.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Herbert Goldstein., (2001) *Classical Mechanics*, Narosa Publishing House , 2nd Edition, New Delhi.
2. Upadhyaya J.C.,(2015) *Classical Mechanics*, Himalaya Publishing House.
3. Gupta, Kumar &Sharma .,(2012) *Classical Mechanics*, PragatiPrakashan, India.
4. Takwale R G &Puranik P S .,(2010) *Classical Mechanics*, Tata McGraw Hill Education Pvt. Ltd Noida.
5. Joshi A.W.,(2002) *Matrices and Tensors in Physics*,New Ag International(P)Ltd.,Publishers,Newdelhi.

Reference Books

1. Rana N.C. and Joag P. S (1998) *Classical Mechanics*, Tata McGraw Hill, New Delhi.
2. Douglas Gregory (2008) *Classical Mechanics*,University press , Cambridge.

Web Resources

1. https://sites.astro.caltech.edu/~golwala/ph106ab/ph106ab_notes.pdf
2. http://users.uoa.gr/~pjioannou/mechgrad/chapter3_Goldstein.pdf
3. <http://www.cds.caltech.edu/~marsden/wiki/uploads/projects/geomech/Alemicds205final.pdf>
4. <https://www.physics.rutgers.edu/~shapiro/507/book7.pdf>
5. [https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Classical_Mechanics_\(Tatum\)/04%3A_Rigid_Body_Rotation/4.08%3A_Force-free_Motion_of_a_Rigid_Symmetric_Top](https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Classical_Mechanics_(Tatum)/04%3A_Rigid_Body_Rotation/4.08%3A_Force-free_Motion_of_a_Rigid_Symmetric_Top)
6. <https://byjus.com/jee/what-is-cartesian-coordinate-system/>
7. [https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Variational_Principles_in_Classical_Mechanics_\(Cline\)/17%3A_Relativistic_Mechanics](https://phys.libretexts.org/Bookshelves/Classical_Mechanics/Variational_Principles_in_Classical_Mechanics_(Cline)/17%3A_Relativistic_Mechanics)

Pedagogy

Lecture, Seminar, Assignment and power point presentation

Course Designer

Ms.R.A.Kiruthika

SEMESTER- I	INTERNAL MARKS : 25	EXTERNAL MARKS : 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH1CC3	QUANTUM MECHANICS - I	CC-III	6	5

Course Objectives

- To study the fundamentals of wave mechanics.
- To study the stationary state and eigen spectrum of systems using time dependent Schrodinger equation.
- To solve the exactly soluble eigen value problems.
- To know the matrix formulation of quantum theory and how it can be used to understand the equation of motion.
- To understand the theory of identical particles and angular momentum.

Pre-requisites

- A thorough understanding of mechanics.
- Knowledge of partial differential equation and variable separable method.
- Commendable knowledge of integral and differential calculus.

Course Outcomes and Cognitive Levels Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall and interpret the classical and quantum mechanics	K1,K2
CO2	Analyze the various applications of quantum mechanics	K3
CO3	Discover the formalism in quantum mechanics	K4
CO4	Apply the different type of approaches to solve quantum mechanical systems	K5
CO5	Elaborate the operators in both classical and Quantum Mechanics	K6

Mapping of CO with PSO and PO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	1	2	3	3	3	3	3
CO2	3	3	3	1	3	3	3	3	3	3
CO3	3	3	3	1	3	2	2	3	2	2
CO4	3	3	2	1	2	1	1	1	1	1
CO5	3	3	2	1	3	3	3	3	3	3

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation;
“-” – Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>SCHRÖDINGER EQUATION APPROACH</p> <p>Recapitulation of the need for Quantum Mechanics - Thought experiments using Young's double slit -Motivation to introduce a wave function-probabilistic interpretation and Normalization - Time dependent Schrödinger equation (free particle in one dimension) - Generalization to three dimension - Non-normalizable wavefunction and Box normalization - Expectation values: Ehrenfest theorem - Conditions on the wave function-The time-independent Schrödinger equation.</p> <p>APPLICATIONS</p> <p>Particle in a square well potential - Solution of wave equation in bound states - Energy Eigenvalues - Energy Eigenfunctions - Square potential barrier: Quantum mechanical tunnelling - Reflection at potential barrier and walls -The free particle - Deuteron</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>ABSTRACT FORMALISM- I</p> <p>Linear vector space - linear operator - Eigenfunctions - Eigenvalues - Hermitian operator- - Commutation relations- Their connection with Poisson Brackets of Classical Mechanics - Properties of Unitary operator- Postulates of quantum mechanics - Observables and their connection with Hermitian operators</p>	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>ABSTRACT FORMALISM- II</p> <p>Uncertainty relation – Dirac's notation - Equation of motion - Momentum representation - Heisenberg method: Matrix representation of quantum states and operator-Properties of matrix element – Evolution of Schrodinger equation in matrix form - Unitary transformation-Linear harmonic oscillator in matrix form.</p>	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>SIMPLE HARMONIC OSCILLATOR</p> <p>Wave-function approach:</p> <p>Schrödinger equation and Energy eigenvalues - Energy eigenfunctions: Series Solution; Asymptotic behavior-Orthonormality - Properties of stationary states</p> <p>Abstract Operator Approach:</p> <p>Formulation of Harmonic oscillator problem in abstract notation - Creation, Annihilation and number operators- Solving the Eigen value problem in Abstract Notation - Eigen states and Energy eigenvalues</p>	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	<p>ANGULAR MOMENTUM</p> <p>Wave-function approach: Angular momentum operators – Commutations relations of Angular momentum - Eigenvalues and eigenfunctions of L^2 and L_z- Separation of variables- Admissibility conditions on solutions - Spherical harmonics - Physical interpretation - Angular Momentum in Stationary States of Systems with Spherical Symmetry</p> <p>Abstract Operator Approach: Constructing the Operators for J^2 and J_z - Raising and lowering operators - Eigenvalues of J^2 and J_z - Angular momentum matrices - Spin angular momentum – Addition of angular momentum- Clebsch Gordon Coefficients – Selection rules – Recursion relations - Computation of Clebsch Gordon Coefficients</p>	19	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self Study for Enrichment (Not included for End Semester Examination) De Broglie's Hypothesis-Interpretation of the Wave-Particle Dualism - Photons: The Quantization of Fields -Alpha emission- Coherent state- Parity.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Mathews P. M., and Venkatesan K., (1987), *A Text Book of Quantum Mechanics*, Tata McGraw Hill, New Delhi.
2. Aruldhas G., (2009), *Quantum Mechanics*, Prentice Hall of India.
3. Ghatak .A., and Lokanathan S., (1987), *A Text Book of Quantum Mechanics*. Tata McGraw Hill, New Delhi.
4. Eugen Merzbacher., (1998), *Quantum Mechanics*, John Wiley & Son, Inc, New York

Reference Books

1. Devanathan V., (2006) *Quantum Mechanics*, Narosa Publishing House, New Delhi
2. Schiff .L., (2004) *Quantum Mechanics*, Tata McGraw Hill, New Delhi
3. Shankar.R., (2007), *Principles of Quantum Mechanics*, Springer, New Delhi
4. Thankappan V.K., *Quantum Mechanics*., Wiley Eastern Ltd, New Delhi

Pedagogy

Chalk and Talk ,Lecture, Seminar, Assignment, Power point presentation

Web References

1. <https://www.britannica.com/science/quantum-mechanics-physics>
2. <https://www.livescience.com/33816-quantum-mechanics-explanation.html>
3. <https://plato.stanford.edu/entries/qm/>

Course Designer

Dr.R.MEENAKSH

SEMESTER-I	INTERNAL MARKS: 40	EXTERNAL MARKS: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH1CC1P	GENERAL PHYSICS AND ELECTRONICS-I(P)	CP-I	6	5

Course Objectives

- To determine certain physical constants
- Demonstrate the concepts of spectrometry and to find optical constants
- Explore the concepts of electrical discharge in applied magnetic field
- Explain the operation of IC 555 timer as multivibrators
- To understand properties and characteristics of electronic components and devices

Pre-requisites

- Fundamental knowledge of Physical and optical constants
- Understand the concepts of specific charge of an electron by Magnetron method
- Experimental knowledge of IC 555 timers as multivibrators

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Explain the basics of experimental physics.	K2
CO 2	Understand the fundamental physics behind many scientific discoveries through hands on experience.	K2
CO 3	Explore the concepts of spectrometry involved in the optic processes.	K3
CO 4	Verify experimentally the basic laws of physics	K4
CO 5	Develop the skill in handling instruments in the construction of circuits	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	1	2	1	2	2	3	2	1	2	1
CO 2	1	3	2	3	1	3	3	2	2	1
CO 3	3	3	2	3	2	3	2	3	3	2
CO 4	2	3	2	3	3	2	3	2	3	2
CO 5	3	2	3	3	3	2	2	2	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

LIST OF EXPERIMENTS (Any 10)	Hours	COs	COGNITIVE LEVEL
1. DETERMINATION OF Q, N, Σ BY ELLIPTICAL FRINGES METHOD 2. DETERMINATION OF RYDBERG'S CONSTANT USING SPECTROMETER 3. DETERMINATION OF WAVELENGTH BY USING MICHELSON'S INTERFEROMETER. 4. CHARGE OF AN ELECTRON BY SPECTROMETER 5. STUDY OF HALL EFFECT IN A SEMICONDUCTOR 6. DETERMINATION OF E/M OF ELECTRON BY MAGNETRON METHOD 7. DESIGN AND STUDY OF ASTABLE AND MONOSTABLE MULTIVIBRATORS USING IC555 8. DESIGN AND STUDY OF WEIN BRIDGE OSCILLATOR 9. DESIGN AND STUDY OF PHASE SHIFT OSCILLATOR 10. OPERATION OF SHIFT REGISTER USING SISO, SIPO, PIPO 11. DESIGN OF REGULATED POWER SUPPLY 12. FREQUENCY DIVIDER USING IC 555. 13. CHARACTERISTICS OF SCR/CHARACTERISTICS OF DIAC/CHARACTERISTICS OF TRIAC	6 Hrs Week	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Ouseph, C.C., Rao, U.J., & Vijayendran, V., (2009). *Practical Physics and Electronics*. S.Viswanathan, Printers & Publishers Pvt Ltd.
2. Dr.Somasundaram, S., (2012). *Practical Physics*. Apsara Publications.

Reference Books

1. Dunlap, R.A., (1988). *Experimental Physics: Modern Methods*. Oxford University Press, New Delhi.
2. Jones, B.K., (1986). *Electronics for Experimentation and Research*. Prentice-Hall.
3. Zbar, P.B., Malvino, A.P., & Miller, M.A., (1994). *Basic Electronics: A Text-Lab Manual*. Tata Mc-Graw Hill, New Delhi.

Web References

1. <https://www.msuniv.ac.in/Download/Pdf/b2efcbdbc4be452>
2. <https://www.studocu.com/in/document/reva-institute-of-technology-and-management/bachelors/msc-electronics-lab-student-copy/17586392>
3. <https://www.vlab.co.in/broad-area-physical-sciences>

Pedagogy

Demonstration, practical sessions and viva voce

Course Designer

Dr.S.Gowri

SEMESTER-I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH1DSE1A	MICROPROCESSOR AND MICROCONTROLLER	DSE-I	6	3

Course Objectives

- To understand the architecture of 8085 & 8051
- To impart the knowledge about the instruction set
- To understand the interfacing circuits for various applications of 8051 microcontroller.
- To introduce the architecture of advanced microprocessors and microcontroller.
- To analyse the basic concepts and programming of 8051 microcontroller

Pre-requisites

- Knowledge about Digital circuits
- Understanding of Programming languages

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Understand the Basics of Microprocessor and impart the knowledge about the instruction set	K1,K2
CO 2	Demonstrate programming proficiency using the various addressing modes and data transfer instructions of microprocessor/Microcontroller	K3
CO 3	Explain the data transfer schemes and interfacing devices	K4
CO 4	Distinguish the instruction set of microprocessor and microcontroller and Create program with Microcontroller	K5
CO 5	Develop programming skill using interfacing and Peripheral devices of Microprocessor	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	1	1	3	1	1	1	3	2	2
CO 2	2	2	1	3	1	3	3	2	2	3
CO 3	1	1	2	3	1	2	3	1	2	2
CO 4	1	1	2	3	1	3	3	3	2	3
CO 5	2	2	1	3	1	3	3	3	2	3

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	CONGNITIVE LEVEL
I	ARCHITECTURE OF 8085: Architecture of 8085 - Data and Address buses - Registers in 8085- Addressing modes in 8085- Pin configuration of 8085 - Instruction set of 8085-Instruction types (based on number of bytes, operation) data transfer - Arithmetic - Logical- Branching- Stack and I/O instructions - Instruction cycles - Fetch operation - Execute operation - Machine cycle and State - Instruction and data flow - Timing diagram - Memory read and memory write cycles.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	MICROPROCESSOR PROGRAMING : Assembly language - Stacks - Subroutines - MACRO - Delay Subroutine - Examples of Assembly language Programming - Addition-Subtraction – Shift an 8-bit number left by one bit-Mask off Least Significant 4Bits of an 8-bit number-Find the largest and Smallest number in a data array - Sum of a series - Multiplication - Division -Multi-byte addition and subtraction.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	DATA TRANSFER SCHEMESAND INTERFACING AND PERIPHERAL DEVICES: Programmed data transfer scheme-Synchronous and Asynchronous and serial data transfer schemes- Interfacing devices- Types of interfacing devices- Programmable Peripheral Interface (PPI- 8255)- Communication interfacing device (Universal Synchronous Asynchronous Receiver Transmitter (USART- 8251))- Programmable DMA controller (8257).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	MICROCONTROLLER-8051: Introduction to microcontroller-Difference between microprocessor and microcontroller. 8051 microcontroller: Pin configuration- Architecture and Key features 8051- Data types and directives Instruction set: Data transfer instructions - Arithmetic instructions – Logical instructions- Branching instructions- Addressing modes - Simple programs – Addition and subtraction of two 8-bit numbers – Multiplication-Division- Largest Number in an array -Sum of a set of numbers.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	MICROPROCESSOR APPLICATIONS: Microprocessor Interfacing and Applications: Programmable peripheral interface Intel 8255- Interfacing 7 segment LED display-Measurement of temperature-Microprocessor based traffic control-To generate square wave or pulse using Microprocessor.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	SELF STUDY FOR ENRICHMENT (Not included for End Semester Examination) Assembly language Programs using Microprocessor - Decimal to Hexadecimal Conversion - Ascending and Descending order- Shift an 8-bit number left by 2 bit - Shift a 16-bit number left by one bit - Shift a 16-bit number left by 2 bit - Mask off Most Significant 4Bits of an 8-bit number.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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Text Books

1. Ram B. (2013). *Fundamental of Microprocessor and Microcontroller*. Dhanpat Rai Publications(P) Ltd, New Delhi. 8th Edition
2. Godse A.P, Godse D.A. (2017). *Microprocessors and microcontrollers*. Technical Publications, Pune. 4th Revised Edition

Reference Books

1. Muhammad Ali Mazidi, Jinnice Gillispie Mazidi. (2004) *The 8051 microcontroller and embedded systems*. Pearson Education, Delhi. 2nd Edition.
2. A. Nagoorkani. (2012) *Microprocessors & Microcontrollers*. RBA Publications, Chennai. 2nd Edition.

Web References

1. http://nptel.ac.in/noc20_ee42
2. <http://classcentral.com/course/swayam-microprocessor-an-interfacing-17694>.

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Dr. T. Noorunnisha

SEMESTER-I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDIT
22PPH1DSE1B	NON - DESTRUCTIVE EVALUATION TECHNIQUES	DSE-I	6	3

Course Objectives

- To impart the knowledge in various Non-destructive testing (NDT) techniques.
- To overview the concepts and methods employed for NDT of Structures and materials.
- To understand the concept of Ultrasonic testing.
- To understand the limitations of NDT techniques.
- To introduce the concept of Real time Radiography Techniques.

Pre-requisites

- Knowledge about Acoustics
- Understanding of Ultrasonics
- Basic ideas about X- Rays

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course ,students will be able to	
CO 1	Understand the basic working principles of various NDT methods and importance of NDT.	K1,K2
CO 2	Identify and Demonstrate the limitations of NDT techniques and codes.	K2,K3
CO 3	Analyze and Interpret Non-destructive testing and Mechanical testing.	K4,K5
CO 4	Examine the Real time Radiography Techniques.	K4
CO 5	Test the instrumentation techniques with the aid of basic Principles.	K5

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	1	1	1	1	3	3	3	2	2
CO 2	2	1	1	1	2	3	3	2	2	1
CO 3	1	1	1	1	1	3	3	3	2	2
CO 4	1	1	1	1	1	3	3	1	2	1
CO 5	1	2	1	1	2	3	1	3	1	2

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	CONGNITIVE LEVEL
I	<p>Overview of NDT: NDT Versus Mechanical testing - Overview of the Non-Destructive Testing Methods for the detection of manufacturing defects- Merits and limitations - Visual inspection - Unaided and aided - Visual Examination- Optical aids used for visual inspection- Applications.</p>	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6
II	<p>Surface NDE Methods: Liquid Penetrant Testing- Basic principles – Procedure for penetrant testing - Penetrant testing materials - Testing methods - Applications and limitations - Magnetic Particle Testing Principle- Magnetizing techniques- Procedure-Equipment used for MPT- Limitations-Eddy Current Testing principles- Applications –Limitations.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Radiography: Radiography Basic principle -X ray source - production of X rays – High energy X ray source- Properties of X rays and gamma rays- radiographic imaging -Inspection techniques - Applications - Limitations - Safety in radiography.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Ultrasonic Testing: Ultrasonic Testing - Ultrasonic transducers- Inspection methods- Techniques for normal beam inspection - Techniques for angle beam inspection - Flaw characterization techniques - detection equipment - Modes of display- Immersion testing- Applications - Advantages-Limitations.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Acoustic Emission: Testing Principles of Acoustic Emission Testing - Techniques- Applications - Thermography: Contact and non-contact inspection methods – Heat sensitive paints and other coatings – Heat sensitive papers – Advantages and limitations – Instrumentations and methods – Applications.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self Study for Enrichment (Not included for End Semester Examination) Basic properties of sound - Difference between Testing and Non Destructive Testing -Different types of Non Destructive Testing methods- Liquid Penetrant Testing and its application - Radio activity testing in Industries- Fundamentals of X-Rays.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Dr. Baldev Raj, T. Jayakumar and M. Thavasimuthu., (2018). *Practical Non- Destructive Testing.*, Narosa Publications, New Delhi. 3rd Edition
2. Ravi Prakash. (2010). *Non-Destructive Testing Techniques.*, New Age International Publishers. 1st Revised Edition

Reference Books

1. Barry Hull & Vernon John., (1988). *Non Destructive Testing.* Springer.
2. Hull B., (2012). *Non-destructive Testing.*, Springer Verlag., Springer Verlag. 1st Edition
3. Charles, J. Hellier., (2013). *Handbook of Nondestructive evaluation.*, McGrawHill, New York. 2nd Edition.
4. Aquil Ahmad Leonard J. Bond., (1989) *Non Destructive Examination and Quality Control, Metals Handbook.*, American Metals Society, Metals Park, OH. Vol. 17 9th Edition.

Pedagogy

Chalk and Talk, Seminar, Assignment, Power Point Presentation, Group discussion and Quiz

Course Designer

Dr. T. Noorunnisha

SEMESTER-I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH1DSE1C	ASTROPHYSICS	DSE-I	6	3

Course Objectives

- To study the positional astronomy such as measurement of distances, and angular positions of celestial objects
- To identify the physical principles involved in stellar processes
- To study the types of galaxies, dynamics of stars in a galaxy and its implication for dark matter.
- To understand the physics of the formation of white dwarfs and neutron stars
- To study the expansion of the universe and evolution of temperature in the Universe

Pre-requisites

- A thorough knowledge in Mechanics and Relativity
- Basic Knowledge in Calculus
- A basic insight in Electromagnetism

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Recall & interpret the basic concepts of Astrophysics	K1,K2
CO 2	Relate and identify the principles of physics in the study of astronomical objects	K2,K3
CO 3	Analyse the celestial objects in the universe	K4
CO 4	Classify and explain the stars, galaxies and stellar evolution	K4,K5
CO 5	Discuss the knowledge of the physical universe and its evolution	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	1	3	3	3	3	2	3
CO2	3	2	3	1	3	3	3	3	2	3
CO3	3	3	3	1	3	3	2	2	1	2
CO4	3	3	3	1	3	3	3	2	1	2
CO5	3	3	3	1	3	2	3	2	1	2

“1” – Slight (Low) Correlation
 “3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
 “-” – Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Distance measurements Historical measurement of the Radius of the Earth Distance to Moon and Sun –Parallax method to measure the distance to nearby stars – Distance to inner planets – Cepheid Variables and distance to nearby Galaxies. Angular coordinates to describe angular positions on the Celestial Sphere – RA and Declination</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>Stellar structure Virial Theorem –application of virial theorem to stellar systems – Formation of stars – Hertzsprung Russell Diagram – main sequence – Mass – Luminosity – Temperature relations of stars in Main Sequence – Post main sequence evolution of stars</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>Compact Objects Formation of White dwarf and neutron stars – Mass estimation of relativistic and non-relativistic white dwarf – Chandrasekhar Mass limit – Mass of Neutron stars – Binary stars in a co rotating frame –Lagrange points – Qualitative aspects of mass transfer and accretion disk formation.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>Galaxies Types of Galaxies – Hubble’s tuning fork diagram – dynamics of stars in galaxies – rotation curve in spiral galaxies – velocity distribution of stars in Elliptical Galaxies– Problems on density profile calculation using different rotation curves.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>Basic Cosmology Newtonian derivation for the expansion of the Universe – Hubble’s law –Radiation and matter in Cosmology – evolution of radiation Temperature in the Universe – Basics of Cosmic Microwave Background Radiation</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>Self-Study for Enrichment (Not included for End Semester Examinations) Concept of Zenith – Nadir– Star clusters- types of binaries – the Discovery of Dark Matter– the importance of 21 cm radiation.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Frank H. Shu. (1982). *The physical universe –An introduction to astronomy*. University Science books.1st Edition.
2. V. B. Bhatia. (2001). *A Textbook of Astronomy and Astrophysics with Elements of Cosmology*. Narosa Publishing House. Revised Edition.
3. K.D.Abhyankar. (1999). *Astrophysics: Stars and Galaxies*. Universities Press.1st Edition.

Reference Books

1. S.L. Shapiro, S. A. Teukolsky.(1983). *Black holes, white dwarfs and neutron stars*. John Wiley.1st Edition.
2. S.Chandrasekhar.(2003).*An introduction to the study of stellar structure*. Dover publications.1st Edition.

Web References

1. <https://www.coursera.org/courses?query=astrophysics>
2. https://onlinecourses.swayam2.ac.in/arp19_ap73/preview

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation

Course Designers

1. Ms. J. Aarthi
2. Dr. B. Anitha

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH2CC4	ELECTROMAGNETIC THEORY	CC-IV	6	5

Course Objectives

- To learn the theory for the field produced by stationary and moving charges.
- To study the charged systems and propagation of electromagnetic fields.
- To learn the basics of electromagnetic theory in electromagnetic waves
- To get knowledge about different geometrics of wave guides

Pre-requisites

- Strong foundation of basic Laws of Electromagnetic theory
- Commendable Knowledge of Electrostatic and Magnetostatic Boundary conditions
- Grasping Power in the concepts Field equations, conservation laws and Gauge transformations

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Remember and Understand the fundamentals of Electrostatics, Magneto statics and Electromagnetic waves.	K1,K2
CO 2	Analyze the concept of Electrodynamics fields and electromagnetic theory in Electrostatics	K3
CO 3	Evaluate the magnetic and electric field using various laws of magnetostatics and electrostatics.	K4
CO 4	Apply the transverse behavior of electromagnetic field equations for different propagating media and boundary value problems in electro-magneto statics	K5
CO 5	Create ability to evaluate electromagnetic wave equations and to solve problems in electro-magneto statics	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	2	3	3	2	2	2
CO 2	3	3	2	2	2	3	1	2	2	1
CO 3	2	3	3	2	2	3	3	1	2	2
CO 4	3	3	2	2	2	1	2	2	2	2
CO 5	3	2	2	2	1	3	3	2	3	1

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	ELECTROSTATICS Coulomb's law – The electric field – Continuous charge distributions- Field lines, Flux and Gauss's law and its application Field due to an infinite, straight, uniformly charged wire – Multipole expansion of a charge distribution- The Divergence of E – The curl of E – Electric potential - Poisson's and Laplace Equation - Potential of a localized charge distribution –Uniqueness theorems.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	BOUNDARY VALUE PROBLEMS IN ELECTROSTATICS Boundary conditions – Potential at a point between the plates of a spherical capacitor –Potential at a point due to uniformly charged disc – Method of image charges –Point charge in the presence of a grounded conducting sphere-- Point charge in the presence of a charged, insulated conducting sphere -Conducting sphere in a uniform electric field –Laplace equation in rectangular coordinates.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	MAGNETOSTATICS The Lorentz Force Law – The Biot- Savart Law – The magnetic field of steady current - The Divergence and Curl of B – Applications of Ampere's Law – Magnetic scalar and vector potentials– Magnetic dipole in a uniform field– Magnetization current- Magnetic intensity–Magnetic susceptibility and permeability	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	FIELD EQUATIONS AND CONSERVATION LAWS Ohm's law -Faraday's law – induced electric field - Inductance – Energy in magnetic fields – Maxwell's equations in free space and linear isotropic media - Boundary conditions on fields at interface-continuity equations – Poynting's theorem - Potential formulation – Lorentz and Coulomb Gauge transformations – retarded potentials.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	ELECTROMAGNETIC WAVES AND WAVE PROPAGATION Electromagnetic waves in free space –Propagation of electromagnetic waves in isotropic dielectrics and in anisotropic dielectrics–Reflection and refraction of electromagnetic waves: Kinematic and dynamic properties –TM and TE modes–Propagation in rectangular waveguides– Cavity resonator.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Electrostatic Boundary conditions-boundary value problems on spherical symmetry-Method of images -Magnetic potential from uniform surface current - of a long solenoid-Potential formulation-Energy and momentum in EM waves	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Jackson.J.D. (1999), *Classical Electrodynamics*, 3rd edition John-Wiley, New York
2. Chopra.K.K and. Agarwal.G.C, (1999), *Electromagnetic Theory* 3rdedition K.Nath & Co.,Meerut
3. Jordan . E.C. and K.G.Balmain,(2015), *Electromagnetic Waves and Radiating Systems*, 3rd edition New Delhi.

Reference Books

1. Griffiths. D.J.(2014) *Introduction to Electrodynamics* 4th edition. Pearson, Essex,
2. Chow. T.L.(2012)*Electromagnetic Theory* 4th edition. Jones and Bartlett Learning.

Web References

1. <https://bbsbec.edu.in/wp-content/uploads/2020/01/Question-Bank2.pdf>
2. <https://studentsfocus.com/ee8391-et-question-papers-electromagnetic-theory-previous-year-question-papers- eee-3rd-sem/>
3. <https://learnengineering.in/ee8391-electromagnetic-theory/>

Pedagogy

Chalk and Talk, Lecture, Seminar, Assignment and Power Point Presentation

Course Designer

Dr.K.KANNAGI

SEMESTER -II	INTERNAL MARKS : 25	EXTERNAL MARKS : 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH2CC5	QUANTUM MECHANICS – II	CC-V	6	5

Course Objectives

- To demonstrate the use of Schrodinger wave equation through some simple one-dimensional problems and their solutions.
- To discuss the quantum features of the new method which are absent in the classical method.
- To familiarize the students to the new mathematical tools such as operators and linear vector space required for venturing into the realm of quantum mechanics and to introduce Schrodinger wave equation.
- To analytically and algebraically treat the orbital angular momentum problem, to bring out its quantum nature and to port it to have a theory of spin angular momentum.
- To generalize the one-dimensional problems to three dimensional ones to broaden the horizon of the students leading to the understanding of the concept of degeneracy.
- To solve hydrogen atom problem to explain atomic spectrum.

Pre - requisites

- A thorough understanding of mechanics.
- Knowledge of partial differential equation and variable separable method.
- Commendable knowledge of integral and differential calculus.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Remember and Understand the perturbation theory to formulate problems for proper understanding of Physics	K1,K2
CO 2	Analyze the advanced techniques in Physics to gain insights towards quantum mechanics	K3
CO 3	Evaluate and ascertain the mathematical concepts behind fundamentals of quantum mechanics.	K4
CO 4	Apply the development of mathematical skills and problem solving in perturbation theory	K5
CO 5	Create the critical thinking over the relativistic quantum physics	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	3	3	3	2	2	3
CO 2	3	2	2	2	2	2	1	2	3	2
CO 3	2	3	3	2	3	3	3	1	2	3
CO 4	2	3	2	2	2	1	2	2	2	2
CO 5	3	2	2	2	1	3	3	2	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	TIME-INDEPENDENT PERTURBATION THEORY I Perturbation theory for discrete levels: Equation in various orders-Non-degenerate levels - degenerate levels: Removal of Degeneracy - Stark effect: Ground state of Helium - First excited state of Helium atom – Spin orbit interaction - Two electron atoms	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	TIME-INDEPENDENT PERTURBATION THEORY II Variational method: Upper bound on ground state energy - Application to excited states -Ground state of a two electron atom - Hydrogen molecule - Exchange Interaction - WKB approximation: One dimensional Schrödinger equation with asymptotic solution-Solution near a turning point-Bohr-Sommerfeld Quantum Condition - WKB solution of the radial wave equation	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	TIME-DEPENDENT PERTURBATION THEORY Perturbative solution for transition amplitude - Selection rule - First order and second transitions: Constant perturbation - Fermi's golden rule - Scattering of a particle by a potential - Inelastic Scattering: Exchange Effects - Harmonic perturbations: Amplitude for transition with change of energy - Transition induced by incoherent spectrum of perturbing frequencies - The Dipole Approximation: Selection Rules- The Einstein Coefficients: Spontaneous Emission	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	SCATTERING THEORY The Born approximation - Validity of Born approximation - Born Series- Eikonal approximation- Partial wave analysis: Asymptotic behaviour of partial waves - Scattering amplitude in terms of phase shifts - Optical theorem - Exactly Soluble Problems :Scattering by a square well potential- Scattering by coluomb potential -Scattering by a hard sphere-Mutual Scattering Of Two Particles: Reduction of the Two - Body Problem-Transformation from Centre of Mass to Laboratory Frame of Reference-Collisions between Identical Particles.	22	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

V	RELATIVISTIC QUANTUM MECHANICS Generalization of the Schrodinger equation-Hydrogen like atom- The Klein - Gordan equation: Plane Wave Solutions; Charge and Current Densities –Non relativistic Limit - Dirac Equation: Dirac’s Relativistic Hamiltonian-Position Probability Density; Expectation Values - Dirac’s matrices -Plane Wave Solutions of the Dirac Equation - Spin of the Dirac particle -	17	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V1	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Differential and total cross section-Scattering amplitude - Scattering amplitude in terms of Green’s functions- Significance of Negative Energy State - Spin Orbit Energy	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Mathews.P. M. and Venkatesan K, (1987), *A Text Book of Quantum Mechanics*, Second edition Tata McGraw Hill, New Delhi.
2. Aruldas G, (2009), *Quantum Mechanics*, Second edition , Prentice Hall of India. Ghatak A & Lokanathan S, (1987), *A Text Book of Quantum Mechanics*, Tata McGraw Hill, New Delhi
3. Eugen Merzbacher, (1998), *Quantum Mechanics*, Third edition, John Wiley & Son, Inc, Newyork

Reference Books

1. Devanathan V, (2006), *Quantum Mechanics*, Narosa Publishing House, New Delhi,
2. Schiff L , (2014), *Quantum Mechanics*, 4th edition, Tata McGraw Hill, New Delhi,
3. Shankar R, (2007), *Principles of Quantum Mechanics*, 2nd edition, Springer, New Delhi.
4. Thankappan V.K, *Quantum Mechanics*, 2nd Edition Wiley Eastern Ltd, New Delhi.

WebReferences

1. <https://www.britannica.com/science/quantum-mechanics-physics>
2. <https://plato.stanford.edu/entries/qm/>
3. <https://www.newscientist.com/definition/quantum-mechanics/>

Pedagogy

Chalk and talk , Lecture, Seminar, Assignment and Power Point Presentation

Course Designer

Dr.R.MEENAKSHI

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH2CCC1A	ELECTRONICS	CCC- I	6	4

Course Objective

- To Provide the working of advanced semiconductor devices and digital circuits
- To Understand the utility of OP-AMP
- To learn the basics of integrated circuit fabrication, applications of timer IC-555
- To get knowledge about building block of digital systems.
- To enhance problem solving skills and to promote the ability to apply digital circuits

Pre-requisites

- A Thorough Knowledge of Semiconducting Devices
- Strong Insight in IC Fabrication Technique
- Grasping Power in the concepts OP-AMP

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Remember and Understand the concepts of semiconductor devices	K1,K2
CO 2	Analyze the working function of Semiconductor and ICs	K3
CO 3	Evaluate the basic concepts of Sensor ,Transducers, operational amplifier , oscillator circuits and IC	K4
CO 4	Apply the Principles and Concepts of Sensor ,Transducers and Semiconductor devices in digital and analog circuits.	K5
CO 5	Recommend projects in electronics relevant to industrial and R &D needs	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	2	1	3	3	2	2	2
CO 2	3	3	2	2	2	3	1	2	2	2
CO 3	2	3	3	2	2	3	3	1	2	2
CO 4	3	3	2	2	2	1	2	2	2	2
CO 5	3	2	2	2	1	3	3	2	3	1

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>SPECIAL DEVICES, SENSORS AND TRANSDUCER</p> <p>Device construction and characteristics of Schottky Diode, Step Recovery Diode, MOSFET, UJT, SCR - Optoelectronic devices: Light Emitting Diode (LED), LASER Diode, Photo Multiplier Tube – Sensors: Photoconductive Cell, Photo Voltaic Cell - Transducers: Electromagnetic Flow meter, Linear Variable Differential Transformer (LVDT), Strain Gauge, Resistance Temperature Detectors.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>OPERATIONAL AMPLIFIER</p> <p>Characteristics of an Op – amp -inverting and non-inverting amplifier – adder, subtractor, differentiator – integrator – Active filters: low pass – high pass filters – voltage comparator – Wave form generators: Phase shift and Wein’s Bridge Oscillator - Schmitt trigger – Design of Binary weighted and R- 2R ladder method - D/A converter – A/D converter, Counter Method, Solving Simultaneous equation.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>IC FABRICATION AND IC 555 TIMER</p> <p>Basic monolithic ICs – epitaxial growth, masking, and etching – Diffusion of impurities – monolithic transistors – integrated diodes – resistors and inductors – monolithic circuit layout – metal semiconductor contact. IC 555 Timer – Functional diagram of 555 timer – Astable multivibrator – Monostable multivibrator – Voltage Controlled Oscillator (VCO).</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>COMBINATIONAL AND ARITHMETIC LOGIC CIRCUIT</p> <p>Combinational logic circuit design – Karnaugh map method – Quine Mc Cluskey’s tabular method – decoders: 1 of 16 Decoder – BCD to seven segments decoder - totalizing counter- Encoder: 8 input priority encoder - 16 line to 1 line multiplexer – Demultiplexer: 1 to 16 Demultiplexer controlled inverter - half adder/ subtractor – Arithmetic logic unit – 2’s complement, adder, subtractor, one digit BCD adder and subtractor using IC7483- Serial and parallel adder units.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>SYNCHRONOUS COUNTERS AND MEMORY DEVICES</p> <p>Universal synchronous counter stage-counter functions – module N counter using IC74193 – design of synchronous counters – ring counter – Johnson counter – Memory classification – ROM – Memory organization - PROM- EPROM- RAM- Block Diagram of Static RAM- Serial and Parallel Expansion of RAM – memory – DRAM- Basic DRAM memory cell- Magnetic disk memory: Charge Coupled device- Magnetic bubble memory.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Gunn Diode- IMPATT Diode-Successive Approximation method-Fabrication Process-Concepts of combinational Logic circuit-PAL and PLA	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
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Text Books

1. Virendra Kumar (2003) *Digital Technology Principles and Practice* New Age International Prentice Hall New Jersey.
2. Albert Paul , Melvino (1982) *Electronic Principles* Tata MC Graw– Hill publishing company Limited, New Delhi.
3. Malcolm Goodge, (2010) *Semiconductor device Technology*, TATA McGraw Hill publications, New Delhi.
4. Millmanand Halkias(1983), *Integrated Electronics*, TATA McGraw Hill publications, New Delh,.
5. AllenMottershed, (1982)*Semiconductor devices and applications*, New Age International publishers.

Reference Books

1. Chattopadhyay. D and Rakshit P.C, (2010),*Electronics Fundamentals and Applications*, New age international Publications, New Delhi.
2. Gayakwad R.A, (1999) *Op. amps & linear integrated circuits*, Prentice HallIndiaPvt.Ltd.
3. Salivahanan S, Suresh Kumar N,(2011)*Electronic devices and Circuits*, Tata McGraw Hill.
4. L.Floyd, *Electronic Devices*, (2006) Pearson Education New York.
5. Theraja B.L, (2012) *Basic electronics*, S.Chand.

Web References

1. <http://www.analog.com/en/education/education-library/tutorials/ analog- electronics.html>
2. https://www.tutorialspoint.com/digital_electronics/index.asp

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Dr.K.KANNAGI

SEMESTER-II	INTERNAL MARKS: 25	EXTERNAL MARKS: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH2CCC1B	NONLINEAR DYNAMICS	CCC-I	6	4

Course Objectives

- To provide an introduction to discrete and continuous nonlinear dynamical systems
- To analyze an advanced level learning of Nonlinear Dynamics, Chaos and applications.
- To understand the concepts of integrable dynamical systems and solitons.
- To understand the concepts on the linear stability analysis

Pre-requisites

- Basic understanding of non-linear differential equations.
- Concepts of solitons.
- Understanding the basic needs of controlling chaos.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Understanding the concepts on the linear stability analysis	K2
CO 2	Explain the basic bifurcations with suitable examples.	K2
CO 3	Illustrate the various characterizing tools such as power spectrum and Lyapunov exponents.	K3
CO 4	Identify numerical experiment of Fermi, Pasta and Ulam and its outcome.	K4
CO 5	Analyze linear and nonlinear systems and appreciate the concept of nonlinearity	K5,K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	3	3	3	3	3	3	2	2	3
CO 2	2	3	3	3	3	3	3	2	2	3
CO 3	2	3	3	3	3	3	3	2	3	3
CO 4	2	3	3	2	3	3	2	2	2	3
CO 5	2	3	3	2	3	3	2	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>NON-LINEAR DYNAMICS Dynamical systems–linear and nonlinear forces–mathematical implications of nonlinearity–working definitions and effects of nonlinearity –damped and driven nonlinear oscillators– autonomous and non-autonomous systems – dynamical systems as coupled first – order differential equations: equilibrium points – phase space/phase plane and phase trajectories – stability – attractors and repellers – classification of equilibrium – points – limit cycle motion – periodic attractor.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>BIFURCATIONS AND CHAOS Bifurcation theory–Local and global bifurcations - Three dimensional autonomous systems and chaos, Lyapunov exponents –Torus–quasi-periodic attractor – Poincaré map – Period doubling cascades–Feigenbaum number–characterization–Homoclinic orbits, heteroclinic orbits–Strange attractor and strange non-chaotic attractor.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>DISCRETE DYNAMICS SYSTEMS, SYNCHRONIZATION AND CONTROLLING OF CHAOS Linear and nonlinear discrete dynamics systems – complex iterated maps–Logistic map–Linear stability–Period doubling phenomena and chaos–Lyapunov exponents–Chaos synchronization– Synchronization manifold and stability properties – Controlling of Chaos –applications.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>FRACTALS, CELLULAR AUTOMATA AND PATTERN FORMATION Dimension of regular and chaotic attractors – Fractals – Koch curve Cantor set – Sierpinski set–Julia and Mandelbrot sets–Cellular automata–Self organized criticality–Stochastic resonance–pattern formation–Time series analysis</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>INTEGRABLE SYSTEMS AND SOLITONS Finite dimensional integrable systems - Linear and nonlinear dispersive systems – Cnoidal and solitary waves - The Scott Russel phenomenon and derivation of Korteweg- de Vries (KdV)equation–Fermi–Pasta–Ulam(FPU)numerical problem–FPU recurrence phenomenon – Numerical experiments of Zabusky and Kruskal – Explicit soliton solutions :one- ,two- and N-soliton solutions of KdVequation– Hirota’s bilinear method.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Simple bifurcations- Chaos-Dynamics systems-Exercise and Problems.</p>		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Lakshmanan M & Rajasekar S., (2003). *Nonlinear Dynamics: Integrability, Chaos & Pattern*, New Delhi: Springer (India) Pvt. Ltd. Print.
2. Wolfram. S. (2002), *A New Kind of Science*, Wolfram Media Inc.,
3. Schuster H.G., (2005), *Deterministic Chaos : An Introduction*, Wiley-VCH

Reference Books

1. Lakshmanan M, and Murali K, (1996), *Chaos in Nonlinear Oscillators*, World Scientific, Singapore.
2. Fuchs A, (2013) *Nonlinear Dynamics in Complex Systems: Theory and Applications for the Life, Neuro- and Natural Sciences*, Springer.
3. Strogatz, S.H. (2014), *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry, and Engineering*, 2nd Edition CRC Press.
4. Misbah. C,(2017) *Complex Dynamics and Morphogenesis: An Introduction to Nonlinear Science*, Springer.
5. Robert C. Hilborn. (2004). *Chaos and Nonlinear Dynamics*, 2nd Edition, India: Oxford University press. Print.

Web References

1. https://onlinecourses.nptel.ac.in/noc19_cy33/preview
2. <https://www.youtube.com/watch?v=A9x2hmSmVjs>

Pedagogy

Chalk and Talk, Power Point Presentation, Seminar, Quiz, Assignment and Group discussion.

Course Designer

Dr. R. MEKALA

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH2CCC1C	SPECTROSCOPY	CCC - I	6	4

Course Objectives

- To understand the vibrational and rotational spectroscopic principles.
- To know the fundamentals of FTIR, NMR techniques.
- To use spectroscopic instruments like FTIR for analyzing the samples.
- To understand the theory of electronic spectroscopy and ESR instrumentation.
- To procure knowledge on advanced level spectroscopic techniques.

Pre-requisites

- Fundamental knowledge on electromagnetic radiation.
- Basic ideas in molecular spectra.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Understand and explain the fundamental concepts and applications of microwave, IR, Raman and other spectroscopic methods.	K1,K2
CO 2	Make use of electronic spectroscopy for chemical analysis.	K3
CO 3	Analyze the NMR and FTIR spectra of various samples and identify their chemical structure.	K4
CO 4	Choose suitable spectroscopic technique and examine the chemical composition of a material.	K5
CO 5	Apply the knowledge acquired and use spectroscopic instruments to examine and develop new materials.	K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	2	1	1	3	3	2	2	2	2
CO 2	3	2	1	1	3	3	3	2	2	3
CO 3	3	2	1	1	3	3	3	2	2	3
CO 4	3	2	1	1	3	3	3	3	2	3
CO 5	3	2	1	1	3	3	3	3	2	3

“1” – Slight (Low) Correlation;

“2” – Moderate (Medium) Correlation;

“3” – Substantial (High) Correlation;

“4” – Indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	MICROWAVE SPECTROSCOPY: Rotation of molecules-Rotational spectra - Rigid and non-rigid diatomic rotator-Intensities of spectral lines- Effect of Isotopic substitution-Polyatomic molecules (Linear, symmetric top and asymmetric top)-Chemical analysis by microwave spectroscopy- Techniques and instrumentation- microwave oven.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	INFRARED SPECTROSCOPY: Vibration of Diatomic molecules-Simple Harmonic Oscillator-Anharmonic oscillator-Diatomic vibrating rotator- The vibration-rotation spectrum-Interactions of rotations and vibrations-The vibrations of polyatomic molecules-Influence of rotation on the Vibrational spectra of linear and symmetric top molecules-Analysis by infrared techniques-Instrumentation-FTIR spectroscopy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	RAMAN SPECTROSCOPY: Classical and quantum mechanical picture of Raman effect - Polarizability-Pure rotational Raman spectra- Vibrational Raman Spectra-Raman activity of vibrations of CO ₂ and H ₂ O- Rule of mutual exclusion-Overtone and combination vibrations- Rotational fine structure -Vibrations of spherical top molecule-structure determination from Raman and IR spectroscopy-techniques and instrumentation-FT Raman spectroscopy - Surfaces for SERS study-SERS microbes Surface selection rules.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	ELECTRONIC SPECTROSCOPY: Electronic spectra of diatomic molecule - Frank-Condon principle-Dissociation energy and dissociation products - Rotational fine structure- Fortrat diagram- Predissociation-Shapes of some molecular orbits- Chemical analysis by electronic spectroscopy-Techniques and instrumentation- ESR spectroscopy-Introduction- Techniques and instrumentation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	NUCLEAR SPECTROSCOPY: Nuclear magnetic resonance spectroscopy-Introduction-Interaction of spin and magnetic field- population of energy levels-Larmor precession-Relaxation time-Double resonance-Chemical shift and its measurement- Coupling constant-Coupling between several nuclei- Quadrupole effects C ¹³ NMR spectroscopy- Interpretation of simple spectrum - Mossbauer spectroscopy:Principle-instrumentation - Applications of Mossbauer spectroscopy: Chemical shift effect of electric and magnetic fields.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	SELF-STUDY FOR ENRICHMENT: (Not to be included for External Examination)		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Principle of atomic absorption spectra - Applications of atomic absorption spectra - Application of FTIR Spectroscopy - Introduction to UV spectroscopy - Types of transition in Organic molecules - Atomic emission Spectroscopy – Difference between atomic absorption spectra and atomic emission spectra.	-		

Text Books

1. Banwell C.N and Mc Cash E.M, (1994), *Fundamentals of Molecular Spectroscopy*, 4th Edition, Tata Mc Graw-Hill, New Delhi.
2. Aruldas G, (2001), *Molecular structure and spectroscopy*, Prentice Hall of India Pvt. Ltd., New Delhi
3. Sindhu P.S, (1990), *Molecular Spectroscopy*, 1st Edition, Tata McGraw-Hill, New Delhi.
4. D.N.Sathyanarayana, (2004), *Vibrational Spectroscopy*, 1st Edition, New age International Publishers, Tamilnadu.

Reference Books

1. King G.W, (1964), *Spectroscopy and molecular structure*, 1st Edition, Holt Rinehart and Winston Inc, London
2. Kaur H, (2009), *Spectroscopy*, 5th Edition, A Pragati Prakashan, Uttarpradesh, India.
3. Raymond Chang, (1980), *Basic Principles of Spectroscopy* Mc Graw-Hill, New York.
4. Engel T. (2015), *Quantum Chemistry and Spectroscopy*, 3rd Edition, Pearson, New York.
5. Carlson T. (2013), *Photoelectron and auger Spectroscopy*. Springer.

Web References

1. [JLExp13.pdf \(mit.edu\)](#)
2. <https://nptel.ac.in/courses/115101003>
3. [B-2 Mossbauer Spectroscopy - Physics 191r \(harvard.edu\)](#)

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Ms. D.DEVI

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH2CC2P	MICROPROCESSOR AND PYTHON PROGRAMMING(P)	CP-II	6	5

Course Objective

- To understand the fundamental Formulation of Numerical Problems of various methods.
- To solve Numerical problems and their applications
- To develop the programming skills of Microprocessor and Python programming
- To Design the Numerical Programmes in Python Language.

Pre-requisites

- Basic ideas in doing experiments in Programmed and formula skills.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the student will be able to	Cognitive Level
CO 1	Understand the basic operations of 8085	K2
CO 2	Apply the knowledge about the code conversions of 8085	K3
CO 3	Analyze the skills in decimal counting of 8085	K4
CO 4	Evaluate the Numerical Problems using Python programming	K5
CO 5	Develop skills in Python Programming.	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	2	2	3	2	1	1
CO 2	2	3	3	3	2	3	2	3	2	2
CO 3	3	3	2	3	3	2	3	3	2	1
CO 4	3	2	3	3	2	3	3	2	3	2
CO 5	3	2	2	2	2	3	3	2	1	1

“1” – Slight (Low) Correlation,

“2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation,

“-” indicates there is no correlation.

<p align="center">LIST OF EXPERIMENTS (Any 15)</p>	<p align="center">HOURS</p>	<p align="center">COs</p>	<p align="center">COGNITIVE LEVEL</p>
<p>A. Microprocessor (8085)</p> <ol style="list-style-type: none"> 1. Finding the largest and smallest numbers in a data array 2. Arranging a set of numbers in ascending and descending orders 3. Study of multibyte decimal addition 4. Study of multibyte decimal subtraction 5. Study of seven segment display 6. Study of ADC interfacing (ADC 0809) 7. Traffic control system 8. Digital clock 9. Generation of square and sine waves using DAC 0800 <p>B. Python Programming</p> <ol style="list-style-type: none"> 1. Least-squares curve fitting– Straight-line fit 2. Least-squares curve fitting– Exponential fit 3. Real roots of one-dimensional nonlinear equations-Newton Raphson method 4. Numerical integration – Composite trapezoidal rule 5. Numerical integration – Composite Simpson’s 1/3 rule 6. Solution of a second-order ODE – Euler method 7. Solution of a first-order ODE – Fourth-order Runge--Kutta method 8. Solution of a second-order ODE – Fourth-order Runge--Kutta method 	<p align="center">6 Hrs/Week</p>	<p align="center">CO1, CO2, CO3, CO4, CO5</p>	<p align="center">K2, K3, K4, K5, K6</p>

Text Books

1. Ouseph C.C, Rao U.J & Vijayendran V. (2009) , *Practical Physics and Electronics*, S.Viswanathan, Printers & Publishers Pvt Ltd
2. Dr. Somasundaram S,(2012) , *Practical Physics*, Apsara Publications
3. Jeeva Jose & P. Sojan Lal, (2016) *Introduction to Computing and Problem Solving with Python*, khanna Book Publishing Co.(P).Ltd,
4. Qingai Kong, Timmy Siau & Alexandre Bayen,(2020) ,*Python Programming and Numerical Methods: A Guide For Engineers And Scientists*, Academic Press Inc.

Reference Books

1. Department of Physics, *Practical Physics*, (M.sc), St. Joseph's College,
2. Mark Lutz, (2014), *Python Pocket Reference*, O'Reilly Media.

Web References

1. <http://vlabs.iitb.ac.in/vlabs-dev/labs/8051-Microcontroller-Lab/labs/exp2/index.php>
2. www.tutorialspoint.com
3. <https://pythonnumericalmethods.berkeley.edu/notebooks/chapter21.03-Trapezoid-Rule.html>

Pedagogy

Demonstration and Practical sessions and viva voce

Course Designer

Dr. S.GOWRI

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PPH2DSE2A	NUMERICAL METHODS AND PYTHON PROGRAMMING	DSE - II	6	3

Course Objectives

- To understand the Basics Concepts and impart the knowledge about the Numerical problems and Python
- To analyse the basic concepts of Numerical Problems and Python
- To impart the knowledge about Finding the solution of Boundary value and Eigen value Problems.
- To understand the basic Formulation of Numerical Problems of various methods.
- To Design the Numerical Programmes in Python Language.

Pre-requisites

- Basic Knowledge about Python Language
- Understanding of Basic concepts of Integration, Differentiation and Interpolation

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO 1	Understand the Basics Concepts and impart the knowledge about the Numerical problems and Python	K1,K2
CO 2	Apply and Demonstrate programming proficiency of Numerical Problems using Python	K3,K4
CO 3	Explain to find the Solution of Boundary value problems and Eigen value problem, Interpolation, Differentiation and Integration	K4,K5
CO 4	Distinguish the various methods of finding the Solution of Boundary value problems and Eigen value problem, Interpolation, Differentiation and Integration	K5,K6
CO 5	Develop programming skill in Boundary value problems and Eigen value problem, Interpolation, Differentiation and Integration	K5,K6

Mapping of CO with PO and PSO

Cos	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	2	3	1	3	3	3	1	1	3
CO 2	3	2	3	1	3	3	3	1	1	3
CO 3	3	2	3	1	3	3	3	1	1	3
CO 4	3	2	3	1	3	3	3	1	1	3
CO 5	3	2	3	1	3	3	3	1	1	3

“1” – Slight (Low) Correlation ,

“2” – Moderate (Medium) Correlation ,

“3” – Substantial (High) Correlation,

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	CONGNITIVE LEVEL
I	<p>SOLUTION OF EQUATIONS AND EIGEN VALUE PROBLEMS</p> <p>Solution of algebraic and transcendental equations - Fixed point iteration method – Newton Raphson method-Solution of linear system of equations – Gauss elimination method -Pivoting – Gauss Jordan method – Iterative methods of Gauss Jacobi and Gauss Seidel- Matrix Inversion by Gauss Jordan method – Eigen values of a matrix by Power method.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>INTERPOLATION AND APPROXIMATION</p> <p>Interpolation with unequal intervals - Lagrange's interpolation – Newton's divided difference interpolation – Cubic Splines – Interpolation with equal intervals - Newton's forward and backward difference formulae.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>NUMERICAL DIFFERENTIATION AND INTEGRATION</p> <p>Approximation of derivatives using interpolation polynomials- Numerical integration using Trapezoidal, Simpson's 1/3 rule - Simpson's 3/8 rule -Taylor's series method–First order differential equation: Euler's method - Modified Euler's method – Improved Euler's method – Second Order Differential equation: Fourth order Runge - Kutta method and Euler's method.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>INTRODUCTION TO PYTHON</p> <p>Operators – Data types and Operations- Numbers – Strings-List – Tuple – Set – Dictionary - Flow control – Decision Making – Loops – Nested Loops – Control Statement – Functions.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>NUMERICAL ALGORITHMS IN PYTHON</p> <p>Real roots of one-dimensional nonlinear equations - Newton Raphson method - Numerical integration – Composite trapezoidal rule - Numerical integration – Simpson's 1/3 rule - Simpson's 3/8 rule – Euler methods- Solution of a first-order ODE – Runge-Kutta method - Solution of a second-order ODE – Runge - Kutta method</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>SELF STUDY FOR ENRICHMENT (Not included for End Semester Examination)</p> <p>Least-squares curve fitting – Straight-line fit - Least-squares curve fitting – Exponential fit .</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

1. Venkataraman M K, (1999), *Numerical Methods in Science and Engineering*, 5th Edition, The National Publishing Company, Madras.
2. Mathews J H, (1998), *Numerical Methods for Mathematics, Science and Engineering*, 2nd Edition, Prentice-Hall of India, New Delhi.
3. Jeeva Jose & Sojan Lal P, (2016), *Introduction to Computing and Problem Solving with Python*, khanna Book Publishing Co.(P).Ltd
4. Qingai Kong, Timmy Siau, Alexandre Bayen, (2020), *Python Programming and Numerical Methods: A Guide For Engineers And Scientists*, Academic Press Inc.

Reference Books

1. Jain M.K, Iyengar S.R.K and Jain Muhammad R.K, (1993), *Numerical Methods for Scientific and Engineering Computation*, New Age International, New Delhi.
2. Mark Lutz (2014), *Python Pocket Reference*, O'Reilly Media.

.s

Web References

1. <https://www.youtube.com/watch?v=QqhSmdkqgjQ>
2. <https://www.vedantu.com/maths/numerical-analysis>
3. <https://www.math.hkust.edu.hk/~machas/numerical-methods.pdf>

Pedagogy

Chalk and Talk, Seminar, Assignment, Power point Presentation, Group discussion and Quiz

Course Designer

Ms. S. PRIYA

SEMESTER - II	INTERNAL MARKS : 25	EXTERNAL MARKS : 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH2DSE2B	PHYSICS OF SENSOR AND TRANSDUCER	DSE - II	6	3

Course Objectives

- To acquire Basic Knowledge Sensing and transducer devices.
- To develop critical thinking and problem solving skills.

Pre-requisites

- Knowledge of physical parameters
- Knowledge of Sensing devices and transducers

Course Outcome and Cognitive Level Mapping:

CO Number	CO statement On the successful completion of the course, students will be able to	Cognitive level
CO 1	Remember and Understand the Primary idea in Sensor and transducers in instrumentation.	K1,K2
CO 2	Analyze the different types of sensors and Transducers.	K3
CO 3	Evaluate the working function of sensor transducers for measurement of displacement, strain, velocity, acceleration etc.	K4
CO 4	Apply the function and view for the sensor, transducer construction, classification, principle of operation and characteristics in proper applications.	K5
CO 5	Create the Critical thinking in sensing and transducer devices.	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	1	3	3	2	2	2	2
CO 2	3	3	2	1	3	3	2	2	2	2
CO 3	3	3	2	1	3	3	2	2	2	2
CO 4	3	3	2	1	3	3	2	2	2	2
CO 5	3	3	2	1	3	3	2	2	2	2

“1” – Slight (Low) Correlation

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“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	SENSOR BASICS Introduction-Mechanical-Electronic Transitions in Sensing- Nature of Sensors-Difference between sensor, transmitter and transducer-Primary measuring elements - Selection and characteristics: Range; resolution, Sensitivity, error, repeatability and linearity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	SEMICONDUCTOR SENSOR Introduction-Sensor Output Characteristics- Wheatstone Bridge- Piezo resistivity in Silicon-Semiconductor Sensor Definitions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	SENSING TECHNOLOGIES Capacitive Sensing- Piezoelectric Sensing- Hall Effect- Chemical Sensors- Improving Sensor Characteristics- Digital Output Sensors- Incremental Optical Encoders- Digital Techniques- Noise/Interference Aspects- Analysis of Sensitivity Improvement- Thin Diaphragm- Increased Diaphragm Area	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	INDUCTIVE & CAPACITIVE TRANSDUCER INDUCTIVE TRANSDUCERS: - Principle of operation- construction details-characteristics and Applications of LVDT Induction potentiometer-variable reluctance transducer. CAPACITIVE TRANSDUCERS: - Principle of operation- construction details-characteristics of Capacitive transducers – different types & signal conditioning- Applications:- capacitor Microphone-capacitive pressure sensor.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	TRANSDUCERS FOR TEMPERATURE Scale of temperature- Temperature transducers- Resistive temperature transducers-Thermistors- Thermoelectric transducers- Solid-state devices	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	SELFSTUDY FOR ENRICHMENT: (Not to be included for External Examination) Characteristics -Static characteristics-Dynamic characteristics Chemical / biological characterization - Thermal Sensors Recent- Trends in Sensor Technologies	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Patranabis.D, *Sensors and Transducers*, Wheeler publisher.
2. Randy Frank, (1995) *Understanding Smart Sensor*, Artech House Boston,London. Second edition
3. Usher.M.J and Keating.D.A (1996), *Sensors and Transducers Characteristics, Applications, Instrumentation, Interfacing* ,Macmillan Press Ltd. Second edition
4. DVS Murthy,(2013) *Transducers and Instrumentation*, PHI 2nd Edition

Reference Books:

1. Arun K. Ghosh,(2012) *Introduction to measurements and Instrumentation*, PHI, 4th Edition.
2. Helfrick.A.D and Cooper W.D, (2001) *Modern Electronic Instrumentation & Measurement Techniques*, PHI.
3. Hermann K.P. Neubert,(2012), *Instrument Transducers*, 2nd Edition, Oxford University Press.

Web References

1. <https://www.geeksforgeeks.org/difference-between-sensor-and-actuator/>
2. <https://www.variohm.com/news-media/technical-blog-archive/difference-between-a-sensor-and-a-transducer>

Pedagogy

Lecture, Seminar, Assignment and Power Point Presentation

Course Designer

Ms.R.A.KIRUTHIKA

SEMESTER II	INTERNAL MARKS: 25	EXTERNAL MARKS: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PPH2DSE2C	MATERIAL CHARACTERIZATION AND MEASUREMENT TECHNIQUES	DSE-II	6	3

Course Objectives

- To illustrate the basic knowledge of optical microscope and image formation.
- To demonstrate X-ray diffractometer and its applications.
- To analyze the concept on fluorescence.
- Examine the formation of SEM images.

Pre-requisites

- Basic understanding on structure of materials.
- Knowledge of the fundamentals of the electron microscope.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the Course, the Student will be able to	Cognitive Level
CO 1	Summarize the knowledge in basic concepts and experimental methods.	K2
CO 2	Make use of the knowledge of material characterization and measurement techniques.	K3
CO 3	Examine the instrumentation details of image formation techniques and application.	K4
CO 4	Explain structure of materials.	K5
CO 5	Discuss the latest developments in measurement techniques and to analyze the usage of materials.	K6

Mapping of CO with PO and PSO

COs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	2	3	2	3	2	3	3
CO 2	3	3	3	2	3	3	3	3	3	3
CO 3	3	3	3	2	3	3	3	3	3	3
CO 4	3	3	2	2	3	3	3	2	3	3
CO 5	3	3	3	2	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>SCOPE OF OPTICAL METALLOGRAPHIC STUDIES: Image formation - resolving power - numerical aperture - empty magnification - depth of focus - components of microscopes - principles of phase contrast - interference and polarized light microscopy - elements of quantitative metallography and image processing.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	<p>X RAY DIFFRACTION AND THEIR APPLICATIONS: X-ray - diffraction directions - diffraction methods - X-ray - diffraction intensities - factors affecting intensity - structure factor - Working principles of diffractometer - counters and cameras - Chemical analysis by X-ray diffraction and fluorescence - determination of particle size and micro/macro strains.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	<p>STUDIES BY MOLECULAR LUMINESCENCE: Introduction – Fluorescence and phosphorescence – Internal conversion – External conversion – Quenching – Theory – Relation between intensity of fluorescence and concentration – Calculation of results – Measurement of fluorescence – Spectrofluorometers – Advantages and limitations.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	<p>STUDIES BY ELECTRON MICROSCOPES: Construction and working principles of transmission electron microscopes - Image formation - resolving power – magnification - depth of focus - elementary treatment of image contrasts - Bright field and dark field images- Scanning electron microscope –construction - interaction of electrons with matter - modes of operation - image formation of plane and fractured surfaces.</p>	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	<p>METALLOGRAPHIC TECHNIQUES: Optical metallography - image analysis - X-ray fluoroscopy – spectrometry – DTA DSC and TGA - working principle – applications - Types and applications of strain gauges.</p>	14	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	<p>SELF STUDY FOR ENRICHMENT: (Not to be included for External Examination) Moseley’s law – Continuous and discontinuous spectra from electron beam sources – Factors affecting fluorescence and phosphorescence – principle and instrumentation of electron microscope.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books:

1. Michael Spencer, (1982). *Fundamentals of Light Microscopy*. Cambridge University Press, UK.
2. Joseph Goldstein, Dale E. Newbury, David C. Joy, Charles E. Lyman, Patrick Echlin, Eric Lifshin,
3. Linda Sawyer, Michael, J.R., (2003). *Scanning Electron Microscopy and X-Ray Microanalysis*. (3rd edition), Springer, US.
4. Cullity, B.D., and Stock, S.R., (2001). *Elements of X-Ray Diffraction*. (3rd edition), Prentice Hall, New York.
5. Hohne, G.W.H., Hemminger, W.F., Flammersheim, H.J., (2003), *Differential Scanning Calorimetry*. (2nd edition), Springer, US.
6. Champness, P.E., (2001). *Electron Diffraction in the Transmission Electron Microscope*. Garland Science, London.
7. Smallman, R.E., (1985). *Modern Physical Metallurgy*. (4th edition) Butterworth-Heinemann, UK. Philips, V.A., (1971), *Modern Metallographic Techniques and their Applications*. Wiley Interscience, New York.

Reference Books:

1. Sharma, B.K., (2013), *Instrumental methods of chemical analysis*. (29th edition), GOEL Publishing House, Meerut.

Web References

1. https://www.rp-photonics.com/numerical_aperture.html
2. <https://physicswave.com/x-ray-diffraction-analysis-principle-instrument-and-applications/>
3. <https://conductscience.com/fluorescence-spectrophotometry-principles-and-applications/>
4. <https://www.slideshare.net/akhtarkamal94/scanning-electron-microscope-38294237>
5. <http://www.chem.latech.edu/~upali/chem466/TA/TA.pdf>

Pedagogy

Chalk and Talk, Assignment, Group discussion and Tutorial session in the laboratory

Course Designer

Dr.N.MANOPRADHA



CAUVERY COLLEGE FOR WOMEN(AUTONOMOUS) TRICHY-18

PG DEPARTMENT OF CHEMISTRY

MINUTES OF BOARD OF STUDIES

The VII Board of Studies Meeting for the Department of Chemistry held at Entrepreneur and Student Incubation Center Smart Room on Friday, 21.10.2022 at 10.30 A.M .

The board of study members considers and approves the curriculum and syllabus of UG and PG Programme first year EVEN semester Chemistry course in the academic year of 2022-2023.

The following members attended the meeting:

- | | |
|------------------------------------|---|
| 1. Mrs. P. Pungayee Alias Amirtham | Chairperson & Head |
| 2. Dr. K. Umamaheshwari. | University Nominee, Sastra Deemed University. |
| 3. Dr. K. Sundaravel | Subject Expert, Bharathiyar University |
| 4. Dr. Sarath Josh MK | Subject Expert , Mahatma Gandhi College, Kannur, Kerala |
| 5. Dr. R. Ramesh | Special Invitee |
| 6. Dr. S. Anbu | International Academic Expert |
| 7. Mr. M. Sivakumar | Placement Representative |
| 8. Ms. S. Priyadharshini | Member Alumna |
| 9. Dr. G. Sivasankari | Member |
| 10. Mrs. A. Sharmila | Member |
| 11. Mrs. P. Thamizhini | Member |
| 12. Dr. V. Sangu | Member |
| 13. Dr. K. Shenbagam | Member |
| 14. Dr. C. Rajarajeswari | Member |
| 15. Dr. R. Subha | Member |

16. Dr. K. Uma Sivakami	Member
17. Dr. S. Saranya	Member
18. Dr. S. Devi	Member
19. Ms. S. Sarviya	Student Member
20. Ms. N. Ramya	Student Member

The following had expressed her inability to attend the meeting due to their preoccupation:

1. Ms. S. Priyadharshini

Minutes of the meeting of SEVENTH BoS MEET-21.10.2022

The Agenda for the meeting was as follows:

ITEM No. BoS/07/01

To consider and approve the Programme structure of B.Sc., Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM No. BOS/07/02

To consider and approve the Second semester syllabus of B.Sc., Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM No. BOS/07/03

To consider and approve the Programme structure of M.Sc., Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM No. BOS/07/04

To consider and approve the Second semester syllabus of M.Sc., Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18

ITEM No. BOS/07/05

To consider and approve the ratification of I semester syllabus of B.Sc Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM No. BOS/07/06

To consider and approve the ratification of I semester syllabus of M.Sc Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM No. BOS/07/07

To consider and approve the ratification to change the part III core practical VI course titled Gravimetric Analysis and Analytical Techniques (P) with the course code 19UCH6CC6P as Gravimetric Analysis and Physical Parameter Practical with course code 20UCH6CC6P in semester VI of ~~B.A~~ undergraduate Programme from 2020 – 2021 batch and onwards.

ITEM No. BOS/07/08

To consider and approve the ratification to change the part III major based elective II course titled Nuclear and Industrial Chemistry/ Basics of Nanoscience and Nanotechnology bearing course code 19UCH6MBE2A/19UCH6MBE2B as Analytical Techniques Practical/ Analysis of Herbal Medicine Practical with course code 20UCH6MBE2AP/20UCH6MBE2BP in semester VI of all Under Graduate Programme from 2020 – 2021 batch and onwards.

The following Resolutions passed by the BoS members.

Resolution No. BoS/07/01

The ratification of I semester syllabus of B.Sc Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

Resolution No. BoS/07/02

The ratification of I semester syllabus of M.Sc Chemistry for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

Resolution No. BoS/07/03

The ratification to change the part III core practical VI course titled Gravimetric Analysis and Analytical Techniques (P) with the course code 19UCH6CC6P as Gravimetric Analysis and Physical Parameter Practical with course code 20UCH6CC6P in semester VI of all undergraduate Programme from 2020 – 2021 batch and onwards.

Resolution No. BoS/07/04

The ratification to change the part III major based elective II course titled Nuclear and Industrial Chemistry/ Basics of Nanoscience and Nanotechnology bearing course code 19UCH6MBE2A/19UCH6MBE2B as Analytical Techniques Practical/ Analysis of Herbal Medicine Practical with course code 20UCH6MBE2AP/20UCH6MBE2BP in semester VI of all Under Graduate Programme from 2020 – 2021 batch and onwards.

“Resolved that Ratification of I semester syllabus of B.Sc Chemistry for 2022-2023 batch and onwards be approved & recommended to the Academic Council, Cauvery College for Women (Autonomous), for further action”.

“Resolved that Ratification of I semester syllabus of M.Sc Chemistry for 2022-2023 batch and onwards be approved & recommended to the Academic Council, Cauvery College for Women (Autonomous), for further action”.

“Resolved that Ratification to change Part III core practical VI course titled Gravimetric Analysis and Analytical Techniques (P) with the course code 19UCH6CC6P as Gravimetric Analysis and Physical Parameter Practical with course code 20UCH6CC6P in semester VI of all Undergraduate Programme from 2020 – 2021 batch and onwards be approved & recommended to Academic Council, Cauvery College for Women (Autonomous) for further action”.

“Resolved that Ratification to change Part III major based elective II course titled Nuclear and Industrial Chemistry / Basics of Nanoscience and Nanotechnology bearing course code 19UCH6MBE2A/19UCH6MBE2B as Analytical Techniques Practical/ Analysis of Herbal Medicine Practical with course code 20UCH6MBE2AP/20UCH6MBE2BP in semester VI of all Under Graduate Programme from 2020 – 2021 batch and onwards be

approved & recommended to Academic Council, Cauvery College for Women (Autonomous) for further action".

Suggestions made by the Panel members during the discussion:

- In Inorganic and Physical Chemistry, Unit – V has changed to Unit – III with addition of introduction to transition metals.
- In the syllabus of Analysis of Industrial Importance Practical, preparation of copper complex is added.
- In Material Science syllabus, self-study portion was changed.
- In Biochemistry – II syllabus, the topic electrophoresis is included in Unit - I
- In Physical Methods in Chemistry – I syllabus, IR and Raman should be added in same unit.
- In Analytical Chemistry syllabus, applications of TGA is included in Unit - V

ITEM No. BoS/07/09

To Thank the Members of Board of Studies of Department of Chemistry, Cauvery College for Women (Autonomous), Trichy-18.

RESOLUTION No. BoS/07/05

Revision of syllabus of core course 19UCH2CC2-General Chemistry -II

- The course title was changed to Inorganic and Physical Chemistry
- Portion for self-study is given in each unit
- Unit I: Bond characteristics.
- Unit II: Periodic table-general properties of states of matter
- Unit III: Minerals and ores
- Unit IV: Free energy change in chemical reactions
- Unit V :- Exothermic- endothermic changes
- Unit II : Changed from Alkanes to s and p block elements.
- Unit III: Changed from Nucleophilic Substitution & Electrophilic Addition Reaction mechanism to Metallurgy.
- Unit IV: Changed from Solid state and liquid state to Liquid and Colloidal state.
- Unit V: Changed from Analytical Methods II to Thermochemistry.

Revision of syllabus of core course 19PCH2CC2-Physical Methods in Chemistry -I

- Portion for Self study is given in each Unit
- Unit I: Problems based on joint application of IR
- Unit II: Problems based on joint application of UV
- Unit III: Problems based on joint application of CMR

- Unit IV: DEPT, INTEPT, Chemical spin decoupling of rapidly exchangeable protons (OH, SH).
- Unit V: Chemical spin decoupling of rapidly exchangeable protons (COOH, NH, NH₂).
- Unit I: changed from fundamentals of Spectroscopic Techniques to Theoretical Principles of Molecular Spectroscopy.
- Unit II: changed from NMR to Electronic Spectroscopy.
- Unit III : changed from UV – Visible and IR Spectroscopy to Raman and UV – Visible Spectroscopy.
- Unit IV: changed from ESR, ORD and Mass Techniques to NMR Spectroscopy.
- Unit V : NQR Spectroscopy was added.

Revision of syllabus of core course 19UCH2CC5-Organic Chemistry -II

- Portion for Self study is given in each Unit
- Unit I: Reactivity of intermediates
- Unit II: Nature of substituents.
- Unit III: Markovnikov's and Anti-Markovnikov's rule, syn-anti addition and elimination
- Unit IV: Jablonski diagram
- Unit V: chemistry of simple heterocycles
- Unit I changed from Aromatic Nucleophilic & Electrophilic Substitution to Effect of Structure on reactivity.
- Unit II changed from Addition and Elimination to Aromatic Nucleophilic & Electrophilic Substitution
- Unit III changed from Organic Photochemistry to Addition and Elimination.
- Unit IV changed from Heterocycles to Organic Photochemistry
- Unit V changed from Natural Products to Heterocycles.

ITEM No. BOS/07/08

To thank the members of Board of Studies of Chemistry.

The Chairperson expressed her deep sense of gratitude and thanks to all members of Board of Studies of Chemistry.

P. Smith JB
(Chairman)

Siritha Prasad

**DEAN OF SCIENCE
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU**

Board of Studies

Dr. P. Pungayya Alias Amirtham
M.Sc., M.Phil., Ph.D.
Assistant Professor and Head
PG Department of Chemistry
Cauvery College for Women (Autonomous)
Tiruchirappalli - 620 018.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG DEPARTMENT OF CHEMISTRY



B.Sc., Chemistry
Syllabus
2022-2023 and Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG DEPARTMENT OF CHEMISTRY**

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc., Mathematics, B.Sc., Physics,

B.Sc., Chemistry PROGRAMME

PO No.	Programme Outcome On completion of B.Sc., Mathematics, B.Sc., Physics, B.Sc. Chemistry Programme, the students will be able to
PO1	Domain knowledge: Analyze, design and develop solutions by applying firm fundamental concepts of basic sciences and expertise in discipline.
PO2	Problem solving: Ability to think rationally, analyse and solve problems adequately with practical knowledge to assess the environmental issues
PO3	Creative thinking and Team Work: Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	Employability: Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	Life Long Learning: Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., CHEMISTRY

PSO NO	Programme Specific Outcomes Students of B.Sc., Chemistry will be able to	POs Addressed
PSO1	Afford a firm foundation in Chemistry that stresses scientific reasoning, analytical problem solving with a molecular perspective	PO1 PO2
PSO2	Acquire knowledge in theoretical and practical tools to exemplify entirely in the working environment.	PO4 PO5
PSO3	Inculcate scientific temperament and create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community.	PO3 PO4
PSO4	Scale up of chemical process after designing, optimization and analysis for developing products required for society.	PO4
PSO5	Expand the knowledge available opportunities related to chemistry in the government services through public service commission particularly in the field of food safety, health inspector, pharmacist etc.	PO4 PO5



Cauvery College for Women (Autonomous)
PG Department of Chemistry
B.Sc., Chemistry

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	Ikkala Illakkiyam	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar – I	22ULH1						
			History of Popular Tales Literature and Sanskrit Story	22ULS1						
			Basic French – I	22ULF1						
	II	English Language Course- I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	General Chemistry	22UCH1CC1	5	5	3	25	75	100
			General Chemistry (P)	22UCH1CC1P	3	3	3	40	60	100
		First Allied Course- I (AC)	A. Calculus and Fourier Series	22UCH1AC1A	4	3	3	25	75	100
			B. Biochemistry – I	22UCH1AC1B						
		First Allied Course- II (AC)	A. Algebra, Analytical Geometry of 3D and Trigonometry	22UCH1AC2A	4	3	3	25	75	100
			B. Biochemistry (P)	22UCH1AC2BP				40	60	
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100
	Total					30	22			
II	I	Language Course-II(LC)	Idaikala Illakiyamum Puthinamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Poetry Textual Grammar and Alankara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course- II(ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Inorganic and Physical Chemistry	22UCH2CC2	5	5	3	25	75	100
			Preparation and Analysis of Industrial Compounds (P)	22UCH2CC2P	3	3	3	40	60	100
		Core Course -III (CC)	Material Science	22UCH2CC3	3	3	3	25	75	100
		First Allied Course – III (AC)	ODE, Laplace Transforms and Statistics	22UCH2AC3A	4	3	3	25	75	100
	Biochemistry – II		22UCH2AC3B							

		Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
	IV	Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
		Extra Credit Course	SWAYAM		As per UGC Recommendation						
		Total			30	23				800	
III	I	Language Course-III (LC)	Kappiyamum Nadagamum	22ULT3	5	3	3	25	75	100	
			Hindi Literature & Grammar – III	22ULH3							
			Poetry Textual Grammar and Vakyarchana	22ULS3							
			Intermediate French - I	22ULF3							
	II	English Language Course-III(ELC)	Learning Grammar through Literature – I	22UE3	6	3	3	25	75	100	
	III	Core Course– IV (CC)	Inorganic and Analytical Chemistry	22UCH3CC4	6	6	3	25	75	100	
			Core Practical - III(CP)	Inorganic Qualitative Analysis (P)	22UCH3CC3P	3	3	3	40	60	100
			Second Allied Course-I (AC)	Physics – I	22UCH3AC4	4	3	3	25	75	100
			Second Allied Course- II (AP)	Physics (P)	22UCH3AC4P	4	3	3	40	60	100
	IV	Generic Elective Course- I (GEC)	Chemistry in Everyday life	22UCH3GEC1	2	2	3	25	75	100	
			Basic Tamil	22ULC3BT1							
			Special Tamil	22ULC3ST1							
			Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	23				700	

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100	
			Hindi Literature and Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French - II	22ULF4							
	II	English Language Course – IV (ELC)	Learning Grammar through Literature – II	22UE4	6	3	3	25	75	100	
	III	Core Course – V(CC)	Organic and Physical Chemistry	22UCH4CC5	6	6	3	25	75	100	
			Core Practical - IV(CP)	Analysis and Preparation of Organic Compounds (P)	22UCH4CC4P	4	4	3	40	60	100
			Second Allied Course- III (AC)	Physics – II	22UCH4AC5	4	3	3	25	75	100
			Internship	Internship	22UCH4INT	-	2	-	-	-	100
	IV	Generic Elective Course- II (GEC)	Food Adulterants and Health Care	22UCH4GEC2	2	2	3	25	75	100	
			Basic Tamil	22ULC4BT2							

		Special Tamil	22ULC4ST2							
		Skill Enhancement Course – I (SEC)	Food Chemistry (P)	22UCH4SEC1P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
		Total			30	25				800
V	III	Core Course – VI(CC)	Inorganic Chemistry - I	22UCH5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Physical Chemistry Practical	22UCH5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Organic Chemistry - I	22UCH5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Physical Chemistry - I	22UCH5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Nuclear and Industrial Chemistry	22UCH5DSE1A	5	4	3	25	75	100
	B. Basics of Nanoscience and Nanotechnology		22UCH5DSE1B							
	C. Dairy Chemistry		22UCH5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Chemistry of Consumer Products (P)	22UCH5SEC2P	2	2	3	40	60	100
			Extra Credit Course	SWAYAM		As per UGC Recommendation				
		Total			30	29				700
VI	III	Core Course – IX(CC)	Organic Chemistry - II	22UCH6CC9	5	5	3	25	75	100
		Core Course –X (CC)	Physical Chemistry - II	22UCH6CC10	5	5	3	25	75	100
		Core Course –XI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Core Practical – VI (CP)	Gravimetric Analysis and Physical Parameter (P)	22UCH6CC6P	4	4	3	40	60	100
		Discipline Specific Elective – II (DSE)	A. Analytical Techniques(P)	22UCH6DSE2AP	5	4	3	40	60	100
			B. Cosmetic Chemistry (P)	22UCH6DSE2BP						
			C. Analysis of Herbal Products (P)	22UCH6DSE2CP						
	Project	Project Work	22UCH6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	-	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
		Total			30	28				700
		Grand Total			180	150				4400

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

*For BSc Mathematics & BCA

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e.30 marks)

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. .24 marks)

Internal Component (Theory)

Component	Marks
Library	05
Assignment & Seminar	10
CIA -I	05
CIA-II	05
Total	25

Internal Component (Practical)

Component	Marks
Observation	05
Record	10
Continual performance	10
Model	15
Total	40

Question Paper Pattern

Answer all the questions

PART A (20X1=20)

Answer all the questions

PART B (5X5=25)

Answer any three questions

PART C (3X10=30)

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH1CC1	GENERAL CHEMISTRY	CORE	5	5

Course Objectives

- The course reviews the structure of the atom, which is a necessary pre-requisite in understanding the nature of chemical bonding in compounds.
- It discusses the periodicity in properties with reference to the s and p block, which is necessary in understanding their group chemistry.
- It provides basic knowledge about ionic, covalent, metallic bonding and reactive intermediates.
- To understand the crystal structures of ionic compounds and the theoretical aspects of volumetric and qualitative inorganic analysis

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recognize and report the fundamental principles of various field of chemistry	K1&K2
CO2	Illustrate the knowledge on atomic structure, bonding, isomerism, reaction intermediates, solid state and analytical techniques.	K3
CO3	Categorize the quantum numbers, elements, hybridization, stability of intermediates, crystal structure, titrations and acid radicals.	K4
CO4	Interpret the periodic properties, geometry of molecules and electronic displacement effects	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Atomic Structure and Periodic Properties: Atomic orbitals, quantum, numbers - Principal, azimuthal, magnetic and spin quantum numbers and their significance. Principles governing the occupancy of electrons in various quantum levels-Pauli's exclusion- principle, Hund's rule, Aufbau Principle, (n+1) rule, stability of half-filled and fully filled orbitals. - Classification as s, p, d & f block elements - variation of periodic properties along period and group - Electronegativity scale - Pauling's scale, Allred and Rochow's scale - Mulliken's scale -variation of metallic characters - Factors influencing the periodic properties.	15	CO1, CO2,CO3, CO4	K1, K2, K3, K4, K5
II	Chemical Bonding-I: Chemical Bond- definition - types of chemical bond - Illustration. Intermolecular forces - dipole - dipole interaction, induced dipole-induced dipole interaction. Hybridisation - Bond length - Bond energy- Bond angle - factors influencing BL, BE and BA. VB Theory - sp, sp ² , sp ³ hybridisation - geometry of NH ₃ , H ₂ O, ClF ₃ , IF ₃ . VSEPR theory - Molecular Orbital Theory - Homonuclear (H ₂ , He ₂ , O ₂ , O ₂ ⁺ , O ₂ ⁻ , N ₂ , F ₂) and Heteronuclear molecules (CO, NO, HF).	15	CO1, CO2,CO3, CO4	K1, K2, K3, K4, K5
III	Basics of Organic Compounds: IUPAC nomenclature of compounds- classification – isomerism - types - structural and stereo isomerism - cleavage of bonds: homolytic and heterolytic cleavages – Inductive- electromeric – mesomeric (resonance)-hyperconjugation and steric effects. Reaction intermediates- carbocation, carbanion, free radicals, carbenes and nitrenes – generation- properties - structure and stability.	15	CO1, CO2,CO3, CO4	K1, K2, K3, K4, K5
IV	Structure of Solids: Crystal Structure - open and closed packed structures – covalent network- ionic and molecular structure - packing of ions in ccp and hcp - radius ratio - coordination number in ionic crystals - crystal structures-sodium chloride, zinc blende, wurtzite, rutile, cesium chloride, fluorite (unit cell diagrams). Crystal defects - Schottky and Frenkel defects.	15	CO1, CO2,CO3	K1, K2, K3, K4
V	Analytical Methods-I: Storage and handling of chemicals - handling of acids, ethers, toxic and poisonous chemicals and first aid procedure - Volumetric analysis - methods of expressing	15	CO1, CO2,CO3	K1, K2, K3, K4

	concentration - Primary and Secondary standards- Different types of titrations – Acid - Base Titrations, Titrimetric method, Iodimetry method - Iodometry Method, Complexometric Titration and Precipitation Titration. Qualitative Inorganic Analysis - Dry Test - Flame Test - Interfering acid radicals - Eliminating of Interfering acid radicals.			
VI	Self-Study for Enrichment (Not to be included for External Examination) Electronic configuration of polyelectronic atoms, Calculation of screening constant and effective nuclear charge - Lewis electron dot structure - Oxidation State and valency of element - Comparison of reactive intermediates based on their stability - Difference between ionic and covalent crystals - Do and Don't in the Science Lab	-	CO1,CO2,CO3	K1, K2, K3, K4

Text Books

1. Puri, B. R., Sharma, L. R. & Kalia, K. K. (2018). Principles of Inorganic Chemistry. 33rd edition. Shoban Lal Nagin Chand & Co., New Delhi.
2. Madan, R.D. (2019). Modern Inorganic Chemistry. 3rd edition. S. Chand & Company Ltd.
3. Bahl, B. S. & Arun Bahl (2021). Text book of Organic Chemistry, 22nd revised edition. S. Chand & Company Ltd.
4. Puri, B. R., Sharma, L. R. & Pathania, M. S. (2022). Principles of Physical Chemistry. 48th edition. Shoban Lal Nagin Chand & Co, New Delhi.
5. Gopalan, R., Subramanian, P. S. & Rengarajan, K. (2003). Elements of Analytical Chemistry. 2nd edition. Sultan Chand & Sons,

Reference Books

1. Soni, P. L. & Mohan Katyal. (2017). Text book of Inorganic Chemistry. 25th revised edition. Sultan Chand & Sons.
2. Vogel, A. I. (2000). Text Book of Quantitative Inorganic analysis including Elementary Instrumental Analysis. The English Language Book Society.

Web References

1. <https://www.thoughtco.com/definition-of-quantum-number-604629>
2. https://www.chemie-biologie.uni-siegen.de/ac/lehre/part1_solid_state.pdf
3. <https://testbook.com/learn/chemistry-vsepr-theory/>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. Dr. P. Pungayee Alias Amirtham
2. Ms. A. Sharmila

Semester I	Internal Marks: 40		External Marks: 60	
COURSECODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCH1CC1P	GENERAL CHEMISTRY(P)	CORE	3	3

Course Objectives

- To learn the techniques of titrimetric analyses.
- To know the estimation of several cations and anions and to know the estimation of total hardness of water.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the basic principles of volumetric analysis	K1
CO2	Demonstrate the experimental methods of volumetric analysis and to estimate the chlorine content in bleaching powder and copper in brass	K2
CO3	Determine the hardness of water and saponification value of oil	K3

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	-	2	3	3	2
CO2	2	2	2	3	2	3	3	3	3	2
CO3	2	3	3	1	2	2	3	3	2	1

“1”–Slight(Low) Correlation

“3”–Substantial(High) Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no correlation.

Syllabus

I Titrimetric Quantitative Analysis

1. Estimation of HCl using NaOH as link and standard oxalic acid solution
2. Estimation of Na₂CO₃ using HCl as link and standard Na₂CO₃ solution
3. Estimation of oxalic acid using KMnO₄ as link and standard oxalic acid solution
4. Estimation of Iron(II) sulphate using KMnO₄ as link and standard Mohr's salt solution
5. Estimation of KMnO₄ using thio as link and standard K₂Cr₂O₇ solution.
6. Estimation of copper(II) sulphate using K₂Cr₂O₇ solution
7. Estimation of Mg(II) by EDTA solution
8. Estimation of Ca(II) by EDTA solution
9. Estimation of chloride ion

II. Applied Experiments

1. Estimation of total hardness of water
2. Estimation of bleaching powder
3. Estimation of saponification value of an oil
4. Estimation of copper in brass

Text Books

1. Venkateswaran, V. & Veeraswamy, R. & Kuandaivelu. (1997). Basic Principles of Practical Chemistry. 2nd edition. New Delhi, Sultan Chand & Sons.
2. Bassett, J. (1985). Text Book of Quantitative Inorganic Analysis. 4th edition. ELBS Longman.

Reference Book

1. Vogel A. I. (2000) Text book of quantitative inorganic analysis. The English language book Society.

Web References

1. <https://www.youtube.com/watch?v=wh6-cYjNNiA>
2. <https://chemlab.truman.edu/files/2015/07/edta.pdf>
3. <https://www.slideshare.net/mithilfaldesai/estimation-of-feii-ions-by-titrating-against-k2-cr2o7-using-internal-indicator>
4. <https://byjus.com/chemistry/titration-of-oxalic-acid-with-kmno4/>
5. <http://www.titrations.info/EDTA-titration-calcium>
6. <https://www.youtube.com/watch?v=qmVQs6Q7tso>

Pedagogy

Demonstration and Practical sessions

Course Designer

➤ Dr. C. Rajarajeswari

FIRST ALLIED COURSE-I (AC)
CALCULUS AND FOURIER SERIES
 (For B.Sc Physics & Chemistry)
 (2022-2023 and Onwards)

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UPH1AC1/ 22UCH1AC1	CALCULUS AND FOURIER SERIES	ALLIED	4	3

Course Objective

- Explore the students with mathematical methods formatted for their major concepts and train them in basic Integrations.
- Analyze mathematical statements and expressions.
- Evaluate the fundamental concepts of Differentiation and Integration.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain the concepts of Calculus and Fourier series	K1, K2
CO2	Classify the problem models in the respective area.	K3
CO3	Solve various types of problems in the corresponding stream.	K3
CO4	Identify the properties of solutions in the core area.	K3
CO5	Discover the applications of Calculus and Fourier series.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	2	2	2	2
CO2	3	2	2	2	2	3	2	2	2	2
CO3	3	2	2	2	2	3	2	2	2	2
CO4	3	2	2	2	2	3	2	2	2	2
CO5	3	2	2	2	2	3	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Successive Differentiation:</p> <p>The n^{th} derivative – Standard results – Method of splitting the fractional expressions into partial fractions - Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product (proof not needed) – A complete formal proof by induction (proof not needed) - Curvature- Circle, radius and center of curvature - Cartesian formula for the radius of curvature – Simple problems in all these.</p>	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Evaluation of integrals:</p> <p>Integration of Rational algebraic functions– Rule (a)– Rule (b) Integration of the form $\int \frac{lx+m}{ax^2+bx+c} dx$ – Rule (c)- Integration of Irrational functions : Integration of the form $\int \frac{px+q}{\sqrt{ax^2+bx+c}} dx$ – Integration of the form $\int \frac{dx}{(x+p)\sqrt{ax^2+bx+c}}$ - Integration of the form $\int \frac{dx}{a+b \cos x}$</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Reduction Formula:</p> <p>Properties of definite integrals –Reduction formula (when n is a positive integer) for</p> <p>1] $\int e^{ax} x^n dx$ 2] $\int x^n \cos ax dx$ 3] $\int \sin^n x dx$ 4] $\int_0^{\frac{\pi}{2}} \sin^n x \cos^m x dx$ (without proof) and illustrations.</p>	13	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Double and Triple Integrals:</p> <p>Definition of the double integral-Evaluation of Double integral (Problems Only)-Change of order and evaluation of the double integral (Problems only).</p>	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Fourier Series:</p> <p>Definition of Fourier Series – Finding the Fourier</p>	10	CO1, CO2, CO3,	K1, K2, K3,

	Coefficients for a given periodic function with period 2π - Even and Odd functions–Half range Fourier series.		CO4, CO5	K4
VI	Self-Study for Enrichment : (Not to be included for External examination) Radius of curvature when the curve is in Polar co-ordinates - (i) $\int \frac{dx}{ax^2 + bx + c}$ (ii) $\int \frac{dx}{\sqrt{ax^2 + bx + c}}$ - (1) $\int \cos^n x dx$ (2) $\int_0^{\frac{\pi}{2}} \cos^n dx$ -Triple Integrals in simple cases(Problems Only)- Development in cosine series - Development in sine series.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume I.S.* Viswanathan Pvt Limited.
2. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume II. S.* Viswanathan Pvt Limited.
3. Narayanan, S & Manichavasagam Pillai, T.K. (2015). *Calculus Volume III. S.* Viswanathan Pvt Limited.

UNIT-I Chapter 3:Sections 1.1 to 1.6,2.1,2.2[1]

Chapter 10:Sections 2.1 to 2.3 [1]

UNIT-II Chapter 1:Sections 7.1,7.3,7.4,8(CASE II, CASE V), 9 [2]

UNIT-III Chapter 1:Sections 11,13.1 to 13.5 [2]

UNIT-IV Chapter 5:Sections 2.1,2.2,4 [2]

UNIT-V Chapter 6:Sections 1to 4[3]

Reference Books

1. Sankarappan, S. Arulmozhi,G. (2006). *Vector Calculus, Fourier series and Fourier Transforms.* Vijay Nicole Imprints Private Limited.
2. Vittal, P.R.(2014). *Allied Mathematics.* Margham Publications.
3. Singaravelu, A.(2003). *Differential Calculus and Trigonometry.* R Publication.

Web Links

1. <https://www.youtube.com/watch?v=tBtF3Lr-VLk&t=64s>
2. <https://www.youtube.com/watch?v=Z4oSGuAZrZM>
3. https://www.youtube.com/watch?v=w6llnAQX_f8
4. <https://www.youtube.com/watch?v=LMcj8o0ERNE>
5. <https://www.youtube.com/watch?v=GAwQGCyWv0>
6. <https://www.youtube.com/watch?v=9X3gqehcFII>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr. P. Saranya
2. Ms. L. Mahalakshmi
3. Ms. P. Geethanjali

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCH1AC1B	BIOCHEMISTRY-I	ALLIED	4	3

Course Objectives

- To describe the chemistry of carbohydrates, proteins and lipids.
- To understand the importance of biomolecules in living organisms.
- To gain knowledge about the diseases occurring due to alterations in the levels of biomolecules.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts and understand the structure, functions of the biomolecules in living organisms	K1&K2
CO2	Apply the concepts to illustrate the role of biomolecules in various metabolic pathways	K3
CO3	Analyze the results of routine biochemical analysis using theoretical concepts	K4
CO4	Evaluate the dimensions of diseases associated with the metabolic disorders	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	2	2	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Carbohydrates: Definition of carbohydrate - Digestion and absorption of Glucose - Fate of glucose after absorption (preliminary idea). Intermediary metabolism of carbohydrates -glycogenesis, glycogenolysis, glycolysis, gluconeogenesis. Regulation of blood sugar - normal range - Hypoglycaemia and Hyperglycaemia - glucose tolerance tests - Diabetic Mellitus - Types and symptoms - glycosuria.	13	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
II	Proteins: Proteins - Definition - Peptide bond formation - classification of proteins based on its physical properties - structure of proteins: primary structure - secondary structure - tertiary structure - denaturation. Absorption-metabolic pool - general pathway of protein metabolism- in born errors of amino acid metabolism - Phenylketonuria, Alkaptonuria (Black urine syndrome) and albinism.	13	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Lipids: Definition – lipids - oxidation of fatty acids - β -oxidation cycle of saturated fatty acids. Ketogenesis, Ketosis – Ketolysis - role of liver in fat metabolism - Cholesterol – absorption - factors influencing absorption. Lipid profile – cholesterol – Triglycerides- lipoproteins - HDL and LDL. Fatty liver - Inborn errors of lipid metabolism.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Enzymes: Definition- classification- examples - Glucose oxidase - mechanism of enzyme action- Factors influencing enzyme action. Digestive enzymes and their action - salivary digestion - gastric digestion - pancreatic and intestinal digestion- Thyroxine - agents interfering with the synthesis of thyroid hormone - Diseases associated with abnormal metabolism of thyroxin.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
V	Blood and Bile Pigments: Blood - functions of plasma proteins - blood groups and Rh factor - coagulation of blood mechanism. Haemoglobin - structure and properties of Hb – metabolism -Bile pigments - examples - Types of Jaundice (preliminary idea).	10	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
VI	Self-Study for Enrichment be included for External Examination) Structure and classification of carbohydrates - Categories of amino acids - Types and functions of lipids - Properties and uses of enzymes - Properties and examples of bile pigments.	-	CO1	K1, K2

Text Books

1. Ambika, S. (2012). Fundamentals of Biochemistry for Medical Students. (7th ed.). Ippincott Williams & Wilkins.
2. Fatima, D., Nallasingam, K., Narayanan, L. M., Arumugam, N., Meyyan, R. P., &Prasanna Kumar, S. (2019). Biochemistry. (7th ed.). Saras Publication.
3. Jain, J. L., Jain, S., &Jain, N. (2016). Fundamentals of Biochemistry.(Revised ed.). S Chand & Co Ltd.

Reference Books

1. Annie Ragland, & Arumugam, N. (2015). Biochemistry and Biophysics. (3rd ed.). Saras Publication.
2. Nelson, D. L., & Cox. M. M. (2017). Lehninger Principles of Biochemistry. (7th ed.). WH Freeman.
3. Voet, D., Pratt, C. W., & Voet, J. G. (2012). Principles of Biochemistry. (4th ed.). John Wiley & Sons.
4. Berg, J. M., Stryer, L., Tymoczko, J., & Gatto, G. (2019). Biochemistry. (9th ed.). WH Freeman.
5. Mathews, C. K., Van Holde, K. E., & Ahern, K. G. (2000). Biochemistry. (3rd ed.). Pearson.

Web References

1. https://www.biologie.ens.fr/~mthomas/L3/intro_biologie/2-sucres-lipides-acides-nucleiques.pdf
2. <https://bio.libretexts.org/@go/page/1861>
3. <https://bio.libretexts.org/@go/page/16827>
4. <https://bio.libretexts.org/@go/page/16101>
5. <https://bio.libretexts.org/@go/page/16828>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Dr. S. Saranya

FIRST ALLIED COURSE-II (AC)
ALGEBRA, ANALYTICAL GEOMETRY OF 3D & TRIGONOMETRY

(For B.Sc Physics & Chemistry)
 (2022-2023 and Onwards)

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UPH1AC2/ 22UCH1AC2	ALGEBRA, ANALYTICAL GEOMETRY OF 3D & TRIGONOMETRYs	ALLIED	4	3

Course Objective

- Analyze the mathematical methods formatted for their major concepts.
- Evaluate the problems in Algebra and Trigonometry.
- Explain the basics of Three-Dimensional geometry.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Explain various notions in Algebra, Analytical Geometry of 3D & Trigonometry.	K1, K2
CO2	Identify the problem models.	K3
CO3	Apply the concepts of Algebra, Analytical Geometry of 3D & Trigonometry.	K3
CO4	Solve the given problems in the respective stream.	K3
CO5	Analyze the applications of the core area.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	2	3	2	2	2	2
CO2	2	2	2	3	2	3	2	2	2	2
CO3	2	2	2	3	2	3	2	2	2	2
CO4	2	2	2	3	2	3	2	2	2	2
CO5	2	2	2	3	2	3	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
 “3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Series Expansion:</p> <p>Application of Binomial Theorem to summation of series – Approximate values – Summation of series by Exponential series - Summation of series by Logarithmic series (Formulae only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
II	<p>Matrices:</p> <p>Matrix-Special types of Matrices –Scalar multiplication of a matrix-Equality of matrices-Addition of matrices-Subtraction of matrices- Symmetric matrix-Skew symmetric matrix-Hermitian and Skew Hermitian matrix –Multiplication of matrix – Inverse matrix-Inner product-Solution of simultaneous equations-Rank of a matrix-Elementary transformation of a matrix-A system of m homogeneous linear equations in n unknowns-Linear dependence and independence of vectors-System of non-homogeneous linear equations - Eigen values and Eigenvectors.(Applications only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
III	<p>Three Dimensional Geometry:</p> <p>The Sphere – Definition- The equation of a sphere when the center and radius are given-The equation of a sphere to find its center and radius- The length of the Tangent Plane from a point to the sphere – The Plane Section of a sphere – Equation of a circle on a sphere – Intersection of two spheres in a circle.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
IV	<p>Expansion of Trigonometric functions:</p> <p>Expansions of $\cos n\theta$ and $\sin n\theta$ - Expansion of $\tan(A + B + C + \dots)$ (omitting examples on formation of equations) –Powers of sines and cosines of θ in terms of functions of multiples of θ – Expansions of $\cos^n \theta$ when n is a positive integer – Expansions of $\sin^n \theta$ when n is a positive integer – Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ- The expansions of $\sin \theta$ and $\cos \theta$ to find the limits of certain expressions.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.

V	Hyperbolic functions: Hyperbolic functions – Relation between hyperbolic functions – Relations between hyperbolic functions and circular functions - Inverse hyperbolic functions.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.
VI	Self-Study for Enrichment : (Not to be included for External examination) Series which can be summed up by the Logarithmic series - Simple applications of Matrices- The equation of the tangent plane to the sphere at a point. (Only problems) - Expansion of $\tan \theta$ in terms of powers of θ - Separation of real and imaginary parts of $\tanh(x+iy)$.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4.

Text Books

1. Manichavasagam Pillai, T.K. Natarajan, T. & Ganapathy, K.S. (2015). *Algebra, Volume I.S.* Viswanathan Pvt Limited.
2. Manichavasagam Pillai, T.K. (2015). *Algebra, Volume II.* S. Viswanathan Pvt Limited.
3. Manichavasagam Pillai, T.K. & Natarajan, T. (2016). *A Text book of Analytical Geometry Part-II 3D.* New Gamma Publishers.
4. Manichavasagam Pillai, T.K. & Narayanan, S. (2013). *Trigonometry.* S. Viswanathan Pvt Limited.

UNIT-I Chapter 3: Sections 10, 14 [1]

Chapter 4: Sections 3, 7, 9 [1]

UNIT-II Chapter 2: Sections 1 to 16 [2]

UNIT-III Chapter 4: Sections 1-5, 6, 6.1, 7, 8 [3]

UNIT-IV Chapter 3: Sections 1 to 4, 4.1, 5, 5.1 [4]

UNIT-V Chapter 4: Sections 1, 2, 2.1 to 2.3 [4]

Reference Books

1. Arumugam, S. Issac, A. (2017). *Analytical Geometry 3D and Vector calculus.* New Gamma Publishing house.
2. Pandey, H.D. Khan, M.Q. & Gupta, B.N. (2011). *A Text Book of Analytical Geometry and Vector Analysis.* Wisdom Press.
3. Singaravelu, A. (2003). *Differential Calculus and Trigonometry.* R Publication.

Web Links

1. <https://www.youtube.com/watch?v=JayFh5EJHcU>
2. <https://www.youtube.com/watch?v=h5urBuE4Xhg>
3. <https://www.youtube.com/watch?v=59z6eBynJuw>
4. <https://www.youtube.com/watch?v=9DyPyJb2N9g>
5. <https://www.youtube.com/watch?v=HOk2XLeFPDk>
6. <https://www.youtube.com/watch?v=G1C1Z5aTZSQ>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr. P. Saranya
2. Dr. L. Mahalakshmi
3. Ms. P. Geethanjali

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH1AC2BP	BIOCHEMISTRY(P)	ALLIED	4	3

Course Objective

- To expertise the student for analysis of any biological sample for identification of its chemical composition

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify and classify the given compounds of carbohydrates, amino acids and lipids based on the characteristic reactions	K1&K2
CO2	Prepare and isolate the biomolecules present in food products	K3
CO3	Estimate the amount of carbohydrate and protein present in the given solution	K4
CO4	Assess the quality and quantity of biomolecules by analytical methods	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

I QUALITATIVE ANALYSIS

(i) Preparation

1. Preparation of buffers (acidic, neutral and alkaline) and determination of pH.
2. Preparation of osazones.

(ii) Qualitative Identification

3. Qualitative identification of carbohydrates
 - Monosaccharides : Pentose, Glucose, Fructose, Mannose
 - Disaccharides : Sucrose, Maltose, Lactose
 - Polysaccharides : Starch, Dextrin and Glycogen
4. Qualitative identification of amino acids
 - Aliphatic : Histidine, Arginine, & Proline
 - Aromatic : Tyrosine, Tryptophan, Phenylalanine
 - Sulphur containing amino acids: Cystein, Cystine & Methionine
5. Qualitative identification of lipids - solubility, saponification, acrolein test, Salkowski test, Lieberman-Burchard test.

(iii) Isolation

6. Isolation of casein from milk.
7. Isolation of egg albumin from egg white.
8. Isolation of starch from potato.

II QUANTITATIVE ANALYSIS

1. Estimation of glucose.
2. Estimation of protein.

III DEMONSTRATION

1. Blood group test

Text Books

1. Rajan, S., & Selvi Christy, R. (2018). Experimental Procedures in Life Sciences. CBS Publishers & Distributors.
2. Gnanpragasam, N. S., & Ramamurthy, G. (2013). Organic Chemistry Lab Manual. Viswanathan, S., Printers & Publishers.

Reference Books

1. Zubay, C. (1986). Biochemistry. Addison Wesley.
2. Wood, W. B. (1981). Biochemistry- A problem Approach. Addison Wesley.

Web References

1. http://nec.edu.np/Publications/Chemistry_LAB_Manual/Experiment%204.pdf
2. <https://microbenotes.com/osazone-test/>
3. https://www.mlsu.ac.in/econtents/1616_Biochemical%20Tests%20of%20Carbohydrate,%20protein,%

[20lipids%20and%20salivary%20amylase.pdf](#)

4. <https://vlab.amrita.edu/?sub=2&brch=191&sim=692&cnt=2>
5. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/2%20ESTIMATION%20OF%20PROTEIN%20BY%20LOWRY.pdf

Pedagogy

Demonstration and practical sessions

Course Designer

1. Dr. S. Saranya

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH2CC2	INORGANIC AND PHYSICAL CHEMISTRY	CORE	5	5

Course Objectives

- The course reviews the chemical bonding, which is a necessary pre-requisite in understanding the nature of chemical bonding existing in compounds.
- Discusses about the sand p block elements.
- Provides basic knowledge about liquid and colloidal state of matter.
- Deliberates the basic concepts of thermochemistry.
- Stretches the knowledge about the different techniques involved in metallurgy.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recognize and account the fundamental ideas of bonding, s, p block elements, thermochemistry, metallurgy and colloidal state	K1&K2
CO2	Exemplify the knowledge on bonding, periodic elements, liquids, colloids, enthalpies and refining process	K3
CO3	Categorize the types of bonding, s block elements, liquid and colloidal state of compounds and their properties.	K4
CO4	Interpret the percent ionic character, dipole moment, Hess's law and techniques used in metallurgy.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	1	3	2
CO2	3	2	1	2	2	3	3	1	1	2
CO3	3	2	2	3	3	3	3	2	2	3
CO4	3	1	2	3	2	3	3	2	1	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Chemical Bonding – II Ionic Bond – Lattice Energy- Born-Haber Cycle- polarity in covalent bonds – covalent character of Ionic bond - Fajan’s rule - effects of Polarisation- percent ionic character- electronegativity difference. Dipole moment and structure of molecules- Hydrogen bonding - properties, types and consequences.	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
II	s and p- Block Elements s- block elements: General characteristics, comparative study of alkali and alkaline earth metals - oxides. Diagonal relationship between Li and Mg, Be and Al. p-Block Elements: General characteristic of groups 13-17, Boron and its compounds-Boric acid- Borax - Boron nitride - Boron trihalide – diborane - compounds of silicon - silicates, silicones and SiCl ₄ .	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Metallurgy Introduction to Transition metals-Metallurgy-various steps in metallurgy – grinding -pulverizing - concentration (ore dressing)-hand picking - gravity separation - froth floatation, electromagnetic separation, chemical separation - calcinations and roasting - smelting, aluminothermic process- purification of metals - zone refining- vapour phase and electrolytic refining.	15	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Liquid and colloidal State: Liquid State - physical properties of liquids – vapour pressure- surface tension- viscosity - refraction- their determination. Liquid Crystals - classification of thermotropic liquid crystals – Smectic - Nematic -Cholesteric Liquid	15	CO1, CO2, CO3	K1, K2, K3, K4

	Crystals- Disc-shaped Liquid Crystals- Polymer Liquid Crystals. Colloids – types of colloidal solutions – classification – preparation – purification – properties – determination of size of particles – gels and their applications –application of colloids.			
V	Thermochemistry Change of internal energy in chemical reaction-change of enthalpy in chemical reaction-enthalpy of reaction at constant volume and constant pressure- enthalpy of neutralization- enthalpy of dissociation- enthalpy of formation-enthalpies of compounds-enthalpies of formation of ions- Kirchoff's equation-Hesse's law and its application	15	CO1, CO2, CO3	K1, K2, K3, K4
VI	Self-Study for Enrichment (Not to be included for External Examination) Bond characteristics- periodic table-general properties of states of matter- exothermic- endothermic changes - free energy change in chemical reactions- minerals and ores.	-	CO1, CO2, CO3	K1, K2, K3, K4

Text Books

1. Puri, B. R., Sharma, L. R. & Kalia, K. K. (2018). Principles of Inorganic Chemistry. Shoban Lal Nagin Chand & Co., 33rd edition, New Delhi,.
2. Madan, R.D. (2019). Modern Inorganic Chemistry. 3rd edition, S. Chand & Company Ltd,
3. J. D. Lee, (2014). New Concise Inorganic Chemistry, 5th edition, Oxford Publishers.
4. Puri, B.R., Sharma, L.R. & Pathania, M.S. (2022). Principles of Physical Chemistry. Shoban Lal 48th edition. Nagin Chand & Co, New Delhi.

Reference Books

1. Soni, P.L. & Mohan Katyal. (2017). Text book of Inorganic Chemistry. 25th revised edition, Sultan Chand & Sons.
2. Peter Atkins, Julio de Paula, and James Keeler, (2017). Atkins' Physical Chemistry, 11th Edition, Oxford University Press, UK.

Web Reference

1. [Chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Supplemental_Modules_and_Websites_\(Inorganic_Chemistry\).](http://Chem.libretexts.org/Bookshelves/Inorganic_Chemistry/Supplemental_Modules_and_Websites_(Inorganic_Chemistry).)
2. https://www.chemie-biologie.uni-siegen.de/ac/lehre/part1_liquid_state.pdf
3. <https://byjus.com/jee/colloids>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. Dr. K. Uma Sivakami

Semester II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH2CC2P	PREPARATION AND ANALYSIS OF INDUSTRIAL COMPOUNDS (P)	CORE PRACTICAL	3	3

Course Objectives

- Learn to the diverse roles of inorganic materials in the industry
- Gain knowledge on fertilizers.
- Explain the principle, working and applications of volumetric analysis.
- Perform quantitative analytical methods by titrations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Provide graduates with the skills, information and learning tools required to carry out professional research, and development and production activities in the field of chemistry.	K1
CO2	Explain the suitability of fertilizers for different kinds of crops and soil.	K2
CO3	Prepare students for professional participation in Chemical industries so as to adapt themselves to jobs which are problem solving	K3
CO4	Infer the students to be result-oriented in the chemical, biochemical and applied technological fields.	K4
CO5	Apply the concept of volumetric analysis in industrial analysis	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	2	2	2	2	2	2	2	3	2	2
CO3	3	2	2	2	2	2	2	2	2	2
CO4	3	2	3	2	2	3	2	2	2	3
CO5	2	3	2	3	3	3	2	2	3	3

“1” – Slight (Low) Correlation –

“2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

Quantitative Analysis

1. Analysis of sodium bicarbonate present in a commercial sample of soda mint tablet.
2. Determination of total alkali content of a commercial detergent.
3. Determination of free acidity in ammonium sulphate fertilizer.
4. Estimation of phosphoric acid in superphosphate fertilizer.
5. Estimation of calcium in chalk – Permanganometry
6. Estimation of citric acid in orange or lemon

Qualitative Analysis

1. Limit test for sulphate, chloride, barium, iron and magnesium ions.
2. Assay of inorganic compounds
3. Purity checking of compounds

Preparation

1. Preparation of Ferric alum
2. Preparation of Potash alum
3. Preparation of Mohr's salt
4. Preparation of tetrammine copper (II) sulphate
5. Preparation of soap
6. Preparation of Talcum powder
7. Preparation of Caprolactam.

Text Books

1. Svehla, G. (1996). Vogel's Qualitative Inorganic Analysis: Prentice Hall.
2. Satinder, K. Juneja ., Dr. Aran, K. (2020). Inorganic Materials of Industrial Importance: S Vinesh & Co.

Reference Books

1. Kingery, W. D., Bowen H. K.; Uhlmann, D. R. (1976). Introduction to Ceramics, Wiley Publishers: New Delhi.
2. Gopalan, R., Venkappayya, D., Nagarajan, S. (2004). Engineering Chemistry: Vikas Publications.

Web References

1. [https://eusalt.com/library/files/EuSalt_AS007-2005_Potassium - Sodium_Tetraphenylborate_Volumetric_Method.pdf](https://eusalt.com/library/files/EuSalt_AS007-2005_Potassium-Sodium_Tetraphenylborate_Volumetric_Method.pdf)
2. http://wwwchem.uwimona.edu.jm/lab_manuals/c10expt3.html
3. <https://patentscope.wipo.int/search/en/detail.jsf?docId=WO2016112814>
4. <https://www.google.com/search?q=Determination+of+free+acidity+in+ammonium+sulphate+fertilizer>.
5. https://www.researchgate.net/publication/344350736_Determination_of_alkali_content_total_fatty_matter_in_cleansing_agents
6. <https://www.tifr.res.in/~pkjoshi/articles/sodamint.pdf>

Pedagogy

Table Work

Course Designers

1. Dr. P. Pungayee Alias Amirtham
2. Dr. G. Sivasankari.

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCH2CC3	MATERIAL SCIENCE	CORE	3	3

Course Objective

- To describe the structure of ceramics and magnetic materials.
- To understand the importance of energy storage materials.
- To gain knowledge about the fuel cell power plant.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall the basic concepts of magnetic, conductors and understand the energy storage materials.	K1&K2
CO2	Apply the concepts to illustrate the role of energy in various materials.	K3
CO3	Analyze the results of different materials using theoretical concepts.	K4
CO4	Evaluate the applications of magnetic, semiconductors, LED, batteries and fuel cell power plant.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Conductors and Insulators: Introduction - semiconductors - classification of semiconductors - intrinsic and extrinsic - n-type and p-type - crystal structure and bonding in Si and Ge - elemental and compound semiconductors - applications - Insulators.	9	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
II	Magnetic Materials: Magnetic dipole - dipole moment - magnetic field strength - magnetic susceptibility - diamagnetic - paramagnetic - ferromagnetic - curie temperature - hysteresis curve - antiferromagnetic - ferrimagnetic - hard and soft magnetic materials - properties - examples - applications.	9	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Ceramics and Display Devices: Classification of ceramics - structure of the ceramics- compounds with NaCl, Fluorite and Perovskite structure - properties of ceramics- applications - active display devices- Light Emitting Diode (LED) - passive display devices - Liquid Crystal Display (LCD)- applications.	9	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Materials for Energy Storage: Batteries – primary and secondary batteries - lithium-lead acid batteries - nickel cadmium batteries - advanced batteries - super capacitors for energy storage - role of carbon nanomaterials as electrodes in batteries and super capacitors.	9	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
V	Fuel cells: Introduction - difference between batteries and fuel cells - components of fuel cells - principle of working of fuel cell - performance characteristics of fuel cells - efficiency of fuel cell - fuel cell power	9	CO1, CO2, CO3,	K1, K2, K3, K4, K5

	plant - fuel processor - fuel cell power section - power conditioner - Advantages and disadvantages of fuel cell power plant.		CO4	
VI	Self Study for Enrichment (Not to be included for External Examination) Bonding in metals and semi-conductors - reason for ferromagnetic spin alignment are contrasted with superconducting spin pairing - ceramic processing - fuel cell stack – hydrogen production and storage.	-	CO1	K1, K2

Text Books

1. Rajendran, V. & Marikani, A. (2009). Materials Science. (9th ed.). Tata McGraw-Hill Publishing Company Limited.
2. VanVlack, L. H., (1975). Elements of materials science and engineering. (6th ed.). Addison-Wesley.
3. Jain, P.C., & Jain, M., (2013). Engineering Chemistry. (6th ed.). DhanpatRai & Sons.

Reference Books

1. Callister, W.D., & Rethwisch, G.D., (2018). Materials Science and Engineering: An Introduction. (10th ed.). Wiley.
2. Kingery, W.D., Bowen, & H.K., Uhlmann, D.R., (1976). Introduction to Ceramics. (2nd ed.). Wiley.
3. Sharma, B.K., (1997). Industrial Chemistry. (8th ed.). Goel Publishing.

Web References

1. <https://www.britannica.com/science/semiconductor>
2. <https://advancedmagnetsource.com/2018/09/03/types-magnetic-materials/>
3. <https://mse.umd.edu/about/what-is-mse/ceramics>
4. <https://www.european-mrs.com/battery-and-energy-storage-devices-materials-eco-design-emrs>
5. <https://georgiasouthern.libguides.com/c.php?g=943952&p=6804654>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Ms. P. Thamizhini

ALLIED COURSE – III
(For Chemistry)
ODE, LAPLACE TRANSFORMS AND STATISTICS
(2022-2023 Onwards)

Semester II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDIT S
22UCH2AC3A	ODE,LAPLACE TRANSFORMS AND STATISTICS	ALLIED	4	3

Course Objective

- **Explain** the basics of Ordinary Differential Equations.
- **Explore** the mathematical methods formatted for major concepts.
- **Emphasize** them in the field of Statistics.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
CO1	Explain various notions in ODE,Laplace transforms & Statistics.	K1,K2
CO2	Classify the problem models in the respective area.	K3
CO3	Identify the properties of solutions in the core area.	K3
CO4	Solve various types of problems in the corresponding stream.	K3
CO5	Analyze the applications of the core area.	K4

Mapping of CO with PO and PSO

os	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	3	2	3	3
CO2	3	2	2	2	2	2	3	2	3	3
CO3	3	2	2	2	2	2	3	2	3	3
CO4	3	2	2	2	2	2	3	2	3	3
CO5	3	2	2	2	2	2	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Ordinary Differential Equations: Equations of the first order but of higher degree – Type A: Equations solvable for $\frac{dy}{dx}$ - Type B: Equations solvable for y - Equations solvable for x - Clairaut's Form (simple cases only).</p> <p>Linear equations with constant coefficients: Definitions – The operator D- Complementary function of a linear equation with constant co-efficients - Particular integral: General method of finding P.I- Special methods for finding P.I.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Laplace Transforms: Laplace Transforms – Definition -Sufficient conditions for the existence of Laplace transform-Basic results-Laplace transform of periodic functions-Some general theorems-Evaluation of integrals using Laplace transform.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Inverse Laplace Transform: The Inverse Transform –Modification of results obtained in finding Laplace transforms to get the inverse transforms of functions- Laplace Transforms to solve ordinary differential equations with constant co-efficients.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Measures of Central Tendency: Arithmetic Mean -- Median -- Mode -- Geometric Mean -- Harmonic Mean. (Simple Problems Only)</p> <p>Measures of Dispersion: Standard Deviation (Simple Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Correlation: Introduction–Meaning of Correlation–Scatter Diagram Karl Pearson's Co-efficient of Correlation – Rank Correlation (Derivations not needed and Simple Problems Only).</p> <p>Linear Regression: Introduction–Linear Regression–Regression Coefficients–Properties of Regression Coefficients(Derivations not needed and Simple Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	Self -Study for Enrichment: (Not included for End Semester Examination) Equations that do not contain x and y for explicitly- Piecewise continuity- Laplace Transforms to solve ordinary differential equations with variable co-efficients - Range-Quartile Deviation–RankCorrelation(RepeatedRanks)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Narayanan. S, Manicavachagam Pillai. T. K. (2016). *Differential Equations and its applications*. S. Viswanathan Pvt Limited.
2. Gupta. S. C, Kapoor. V. K. (2014). *Fundamentals of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.

Chapters and Sections

- UNIT-I Chapter 4: Sections 1-3 [1] Chapter 5: Sections 1-4 [1]
UNIT-II Chapter 9: Sections 1-5 [1]
UNIT-III Chapter 9: Sections 6-8 [1]
UNIT- IV Chapter 2: Sections 2.5-2.9, 2.13(2.13.4 Only) [2]
UNIT- V Chapter 10: Sections 10.1 to 10.4 and 10.7.1[2]
Chapter 11: Sections 11.1 to 11.2(11.2.1 and 11.2.2 only)[2]

Reference Books

1. Narayanan. S, Manicavachagam Pillai. T.K. (2003). *Calculus, Vol. III*. S. Viswanathan Pvt Limited.
2. Pillai Bagavathi. R. S. N. (2019). *Statistics Theory and Practice*. S Chand and Company Limited.
3. Gupta. S.C. & Kapoor. V.K. (2004). *Elements of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.

Web References

1. https://www.youtube.com/watch?v=OM01KTc0_9w
2. <https://www.youtube.com/watch?v=dCVBZbebl8Y>
3. <https://www.youtube.com/watch?v=Y8GXpS31CGI>
4. <https://www.youtube.com/watch?v=IVJjm5FE4x8>
5. <https://www.youtube.com/watch?v=YGOBRCEZiC8>
6. <https://www.youtube.com/watch?v=dLJp6DrPark>
7. https://www.youtube.com/watch?v=nk2CQITm_eo
8. <https://rcub.ac.in/econtent/ug/bcom/sem4/Business%20Statistics%20Unit%204%20Correlation%20and%20Regression.pdf>

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment.

Course Designer

1. Dr. P. Geethanjali

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCH2AC3B	BIOCHEMISTRY-II	ALLIED	4	3

Course Objectives

- To gain knowledge about the various analytical techniques in separation and isolation of cells and tissues for studying their functional abnormalities.
- To understand the principles and methodologies involved in biochemical analysis.
- To acquire knowledge on nutritional importance of proteins, carbohydrates, lipids, vitamins and minerals in diet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and understand the basic tools and techniques involved in the analysis of biomolecules and describe the metabolic abnormalities and importance of nutrients in diet.	K1&K2
CO2	Apply various methodologies to analyze biomolecules.	K3
CO3	Investigate the biomolecules using various bio-analytical techniques.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Basic Techniques in Biochemistry: Purification – centrifugation – filtration – dialysis - homogenization – adsorption – absorption- partition - centrifuge- types of rotors & application - density gradient centrifugation, sedimentation - sedimentation coefficient- electrophoresis – types.</p>	15	CO1, CO2, CO3	K1, K2, K3, K4
II	<p>Analytical Techniques in Biochemistry: Concept of buffer – preparation- Henderson-Hasselbach equation - working principle of a pH meter. Microscopy: Light microscopy- phase contrast - electron microscope and fluorescent microscope-principle - instrumentation and their applications. UV-visible and fluorescence spectroscopy-principle and instrumentation. Determination of absorption maxima and molar extinction coefficient (of a relevant organic molecule).</p>	15	CO1, CO2, CO3	K1, K2, K3, K4
III	<p>Clinical Biochemistry: Collection of blood – Anticoagulant - preservation - Estimation of Hb - PCV, WBC, RBC - Platelets - ESR. Clotting time - bleeding time - normal value - clinical interpretation. Urine Analysis: Composition – collection – preservation - gross examination - interfering factors - chemical examination - Ketone bodies in urine - bile pigments – hematuria - uric acid - microscopic examination of the urinary sediment.</p>	15	CO1, CO2, CO3	K1, K2, K3, K4

IV	Nutritional Biochemistry: Definition of food and Nutrition - balanced diet. basic five food groups - calorific values of foods - determination by bomb calorimeter - BMR and factors affecting - energy requirements - recommended dietary allowance (RDA) for children - adults - pregnant and lactating women - sources of complete and incomplete proteins. Biological value of proteins.	15	CO1, CO2, CO3	K1, K2, K3, K4
V	Metabolic and Lifestyle Disorders: Obesity - eating disorders like anorexia, nervosa and bullemlia. Diabetes mellitus as metabolic syndrome - relationship with hypertension, obesity, hypothyroidism and stress. Cardio vascular disorders - Irritable bowel syndrome- influence of diet - stress and environment on the condition.	15	CO1, CO2, CO3	K1, K2, K3, K4
VI	Self Study for Enrichment (Not to be included for External Examination) Types of buffer- Significance of sugar in urine- Specific dynamic action of foods-Types of life style disorder.	-	CO1	K1, K2

Text Books

1. Swaminathan, M. (2014). Advanced Text Book on Food & Nutrition. (2nd ed.). The Bangalore Press.
2. Chatterjea, M. N., & Rana Shinde. (2012). Textbook of Medical Biochemistry, (8th ed.). Jaypee Brothers Medical Publishers.
3. Plummer, D. T. (1998). An Introduction to Practical Biochemistry. (3rd ed.). Tata McGraw Hill Education Pvt. Ltd.
4. Srilakshmi. B. (2019). Dietetics. (8th ed.). New Age International, New Delhi.

5. Ambika, S. (2012). Fundamentals of Biochemistry for Medical Students. (7th ed.). Ippincott Williams & Wilkins.
6. Jain, J. L., Jain, S., & Jain, N. (2016). Fundamentals of Biochemistry. (Revised ed.). S Chand & Co Ltd.

Reference Books

1. Upadhyay, Upadhyay & Nath (2020). Biophysical Chemistry - Principles and Techniques. (4th ed.). Himalaya Publishing House.
2. Annie Ragland, & Arumugam, N. (2015). Biochemistry and Biophysics. (3rd ed.). Saras Publication.
3. Nelson, D. L., & Cox. M. M. (2017). Lehninger Principles of Biochemistry. (7thed.). WH Freeman.
4. Voet, D., Pratt, C. W., & Voet, J. G. (2012). Principles of Biochemistry. (4th ed.). John Wiley & Sons.

Web References

1. <https://nptel.ac.in/courses/102103044>
2. <https://nptel.ac.in/courses/102103044>
3. <https://pubmed.ncbi.nlm.nih.gov/27881259/>
4. <https://www.nhs.uk/conditions/metabolic-syndrome/>
5. <https://www.upstate.edu/gch/pdf/services/ibd-read-lab-results.pdf>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Dr. S. Saranya



Cauvery College for Women (Autonomous)
PG Department of Chemistry
B.Sc., Chemistry

Candidates admitted from the Academic year 2020-2021 and onwards

Semester	Part	Course	Course Title	Course Code	Inst. Hrs / Week	Credits	Exam			Total
							Hrs.	Marks		
								Int.	Ext	
VI	III	Core Course – VIII (CC)	Organic Chemistry - II	19UCH6CC8	6	5	3	25	75	100
		Core Course –IX (CC)	Physical Chemistry - II	19UCH6CC9	6	5	3	25	75	100
		Core Practical – VI (CP)	Gravimetric Analysis and Physical Parameter (P)	20UCH6CC6P	4	4	3	40	60	100
		Major Based Elective – II	A. Analytical Chemistry Techniques (P)	20UCH6MBE2AP	3	3	3	40	60	100
			B. Analysis of Herbal Medicine (P)	20UCH6MBE2BP						
		Major Based Elective –III	A. Polymer Chemistry	19UCH6MBE3A	5	5	3	25	75	100
			B. Pharmaceutical Chemistry	19UCH6MBE3B						
	Project	Project Work	20UCH6PW	5	3	-	-	100	100	
	V	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
		Extension activity		19UGEA	0	1	0	-	-	-
Total					30	27				700

Semester VI	Gravimetric Analysis and Physical Parameter (P)	Hours/Week-4	
Core Practical VI (CP)		Credit-4	
Subject Code- 20UCH6CC6P		Internal 40	External 60

Course Objectives

This core practical provides.

- To perform the gravimetric analysis and estimating the given compound.
- To provide the practical training to the students in chromatographic techniques

Course outcomes

On the successful completion of the course, students will be able to

CO	CO Statement	Knowledge Level
CO 1	Know about the accuracy in Gravimetric estimations and its significance	K1
CO 2	Identify the compounds using thin layer Chromatography	K2
CO 3	Demonstrate the experimental method of Paper chromatography in the separation of amino acids and dyes	K2
CO 4	Analyze the physical constants of the organic compounds	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	M
CO2	S	S	M	S	S
CO3	S	M	S	S	S
CO4	M	S	M	S	M

S-Strong; M- Medium; L-Low

Semester VI
Gravimetric Analysis and Physical Parameter (P)

I GRAVIMETRIC ANALYSIS

1. Estimation of Lead as Lead chromate.
2. Estimation of Barium as Barium Chromate.
3. Estimation of Nickel as Nickel – DMG complex.
4. Estimation Calcium as Calcium oxalatemonohydrate
5. Estimation of Aluminium as Aluminium oxyquinolate.
6. Estimation of iron as iron (II) oxide

II PHYSICAL PARAMETERS

Determination of melting point and boiling point of organic compounds.

Text books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	V. Venkateswaran, R. Veeraswamy and A. R. Kulandaivelu	1997	Basic Principles of Practical Chemistry	Sultan Chand & Sons, New Delhi.
2	N. S Gnanaprakasam and G Ramamoorthi	2007	Organic Chemistry Lab Manual	SV printers
3	Mohan. J	2003	Organic Analytical Chemistry- Theory and Practice	Narosa

Reference books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	Raj K Bansal	2001	Laboratory Manual of Organic Chemistry	New Age International Publishers

2	A. I. Vogel, T.R Tatchell, B. S. Furniss, A.J. Hannaford and P.W.G.Smith	1989	Vogel's Textbook of Practical Organic Chemistry	Pearson India
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Course Designers

- ❖ Dr. Pungayee Alias Amirtham
- ❖ Dr.R.Subha

Semester VI	Analytical Chemistry Techniques (P)	Hours/Week-3	
Major Based Elective- II		Credit-3	
Subject Code- 20UCH6MBE2AP		Internal 40	External 60

Course Outcome

- To acquire knowledge about performing analytical experiments.
- To gain more insights on analytical methods such as chromatography, titrations and pH measurements.

Course outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Identify and separate the given compounds using various analytical methods.	K1&K2
CO2	Apply the theoretical concepts to perform experiments	K3
CO3	Analyse the quality and quantity of the given compounds using methods such as chromatography, titrations and pH measurements.	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4	PO5
CO1	S	S	S	S	S
CO2	S	S	S	S	S
CO3	S	S	M	S	S

S-Strong; M- Medium; L-Low

Semester VI
Analytical Chemistry Techniques (P)

1. Paper Chromatography –Separation of mixture:
 - a) Sugars
 - b) Amino Acids
 - c) Dyes
 - d) Metal ions
 - e) Indicators
2. Thin Layer Chromatography – Separation of mixture:
 - a) Nitro compounds.
 - b) Metal ions
3. Separation of plant pigments using paper chromatography:
 - a) Chlorophyll A
 - b) Chlorophyll B
 - c) Xanthophylls
 - d) Carotenoids
4. Analysis of Milk of Magnesia.
5. Analysis of soil
 - a) Determination of pH of soil.
 - b) Determination of total soluble salts.
 - c) Determination of carbonate and bicarbonate.
 - d) Determination of calcium, magnesium and iron.
6. Determination of calcium ion concentration in egg shell/milk/limestone samples.
7. Determination of caffeine in tea samples.

Text Books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	F. W. Fifield and D. Kealey	2000	Principles and Practice of Analytical Chemistry	Blackwell Science Ltd
2	R. V. Dilts	2010	Analytical Chemistry: Methods of Separation	Van Nostrand, New York
3	Daniel, C. Harris	2015	Quantitative Chemical Analysis	WH Freeman

Reference Books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	J. Mendham	2009	Vogel's Quantitative Chemical Analysis	Pearson Education
2	Gary D. Christian, Purnendu K. Dasgupta and Kevin A. Schug.	2013	Analytical Chemistry	Wiley

Course Designer

❖ Dr. S. Saranya

Semester VI	Analysis of Herbal Medicine (P)	Hours/Week-3	
Major Based Elective- II		Credit-3	
Subject Code- 20UCH6MBE2BP		Internal 40	External 60

Course Objective

- To know estimate the phytochemical in medicinal herbs.
- To learn methods to prepare lotion, cream, churna and table.

Course Outcome

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the principle and testing methods of Excipients of natural origins.	K1, K2
CO2	Isolate, identify and estimate alkaloids, phenol content, aldehydes present in medicinal plant	K3, K4
CO3	Prepare and analyses herbal churna, tablet, lotion and shampoo.	K4, K5

Mapping of Course Outcomes

COs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	L	L	S
CO2	M	S	L	L	M
CO3	S	M	M	M	S

S-Strong; M-Medium; L-Low

Semester VI
Analysis of Herbal Medicine(P)

Physical and chemical test for evaluation of herbal medicines:

A. Quantitative estimation

- a) Determination of total alkaloids in cinchona extract.
- b) Determination of proximate value of edible oil.
- c) Determination of aldehyde content in lemon oil.
- d) Estimation of total phenol content powdered herbal drug.
- e) Refractive index value of castor oil.

B. Qualitative preliminary test for phytochemicals:

Flavonoids, phenolic compounds, alkaloids, glycosides, carbohydrates, carotenoids, proteins, tannin, aminoacids, sterols Screening of Aqueous Extract of Neem.

C. Preparation of drugs:

- a) Preparation Turmeric Cream.
- b) Preparation Herbal Lotion.
- c) Preparation and Standardization of Methi-Shikakai Shampoo.
- d) Preparation of Orange Syrup B.P.C.

Text Books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	Willow J. H. Liu	2021	Traditional Herbal Medicine Research Methods: Identification, Analysis, Bioassay, and Pharmaceutical and Clinical Studies	Jon Wiley publication

Reference Books

S.No.	Author Name	Year of Publication	Title of the Book	Publisher Name
1	K. K. Rajasekhar, B. Kishore, J. Bhavitha	2021	Text book of herbal and cosmetic analysis	Independent online publication

Course Designer

❖ **Dr. V. Sangu**, Assistant Professor, Department of Chemistry

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI

PG DEPARTMENT OF CHEMISTRY



M.Sc., Chemistry
Syllabus
2022-2023 and Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG DEPARTMENT OF CHEMISTRY**

VISION

- To progress into a centre of superiority in Chemistry that will blend state-of-the-art practices in professional teaching in a communally enriching way, with the holistic progress of the students as its prime emphasis.

MISSION

- To produce graduates committed to integrity, professionalism and lifelong learning by widening their knowledge horizons in range and depth.
- To awaken the young minds and discover talents to achieve personal academic potential by creating an environment that promotes frequent interactions, independent thought, innovations, modern technologies and increased opportunities.
- To enhance the quality through basic and applied research frameworks, and encourage the students to take part in entrance and competitive examinations for higher studies and career.
- To enhance services to the community and build partnerships with the industry.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc., Mathematics, M.Sc., Physics,
M.Sc., Chemistry PROGRAMMES

PO No.	Programme Outcome On completion of M.Sc., Programme, the students will be able to
PO1	Problem analysis: Provide opportunities to develop innovative design skills, including the ability to formulate problems, to think creatively, to synthesize information, and to communicate effectively.
PO2	Scientific skills: Create and apply advanced techniques and tools to solve the societal environmental issues.
PO3	Environment and Sustainability: Ascertain eco-friendly approach for sustainable development and inculcate scientific temper in the society.
PO4	Ethics: Imbibe ethical and social values aiming towards holistic development of learners.
PO5	Lifelong learning: Instill critical thinking, communicative knowledge which potentially leads to higher rate of employment and also for higher educational studies.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc.
CHEMISTRY

PSO NO.	Programme Specific Outcomes` Students of M.Sc., Chemistry will be able to	POs Addressed
PSO1	Acquire knowledge in basic concepts, fundamental principles, and applications of chemical and scientific theories and their relevancies in the day-to-day life.	PO1 PO2
PSO2	Design experiments, analyze, synthesize and interpret data to provide solutions to different industrial problems by working in the pure, inter and multi-disciplinary areas of chemical sciences.	PO1 PO2 PO3
PSO3	Attain maneuver in diverse contexts with Global Perspective	PO3 PO4
PSO4	Gain a thorough Knowledge in the subject to be able to work in projects at different research as well as academic institutions.	PO1 PO2 PO5
PSO5	Afford Global level research opportunities to pursue Ph.D programme targeted approach of CSIR – NET examination	PO1 PO2 PO3 PO4 PO5



Cauvery College for Women (Autonomous), Trichy-18
PG Department of Chemistry

M.Sc., Chemistry

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Organic Chemistry – I	22PCH1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Inorganic Chemistry – I	22PCH1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Physical Chemistry – I	22PCH1CC3	6	5	3	25	75	100
	Core Practical - I (CP)	Organic Chemistry – I (P)	22PCH1CC1P	6	5	6	40	60	100
	Discipline Specific Elective Course-I (DSE)	A. Instrumentation Techniques (P)	22PCH1DSE1AP	6	3	6	40	60	100
		B. Nanoscience and Nanotechnology (P)	22PCH1DSE1BP						
C. Biochemistry (P)		22PCH1DSE1CP							
Total				30	23				500
15 Days INTERNSHIP during Semester Holidays									
II	Core Course– IV (CC)	Physical Methods in Chemistry – I	22PCH2CC4	6	5	3	25	75	100
	Core Practical – II (CP)	Organic Chemistry – II (P)	22PCH2CC2P	6	5	6	40	60	100
	Core Choice Course– I (CCC)	A. Organic Chemistry – II	22PCH2CCC1A	6	4	3	25	75	100
		B. Chemistry of Natural Products	22PCH2CCC1B						
		C. Molecular Rearrangement	22PCH2CCC1C						
	Core Practical – III (CP)	Inorganic Chemistry– I (P)	22PCH2CC3P	6	5	6	40	60	100
	Discipline Specific Elective Course-II (DSE)	A. Green Chemistry	22PCH2DSE2A	6	3	3	25	75	100
		B. Forensic Chemistry	22PCH2DSE2B						
		C. Analytical Chemistry	22PCH2DSE2C						
Internship	Internship	22PCH2INT	-	2	-	-	100	100	
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24				600

III	Core Course– V (CC)	Physical Chemistry- II	22PCH3CC5	6	5	3	25	75	100
	Core Practical – IV (CP)	Inorganic Chemistry –II (P)	22PCH3CC4P	6	5	6	40	60	100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		B. Photochemistry and Advanced Chemical Kinetics	22PCH3CCC2B						
		C. Applied Chemistry	22PCH3CCC2C						
	Core Practical - V (CP)	Physical Chemistry – I (P)	22PCH3CC5P	6	5	6	40	60	100
	Discipline Specific Elective Course-III (DSE)	A. Chemistry for Competitive Examinations	22PCH3DSE3A	4	3	3	25	75	100
		B. Bioorganic Chemistry	22PCH3DSE3B						
		C. Pesticide Chemistry	22PCH3DSE3C						
	Generic Elective Course -I (GEC)	Nanoscience and Nanotechnology	22PCH3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24				600
IV	Core Course–VI (CC)	Physical Methods in Chemistry - II	22PCH4CC6	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Chemistry of Nanoscience	22PCH4CCC3A	6	4	3	25	75	100
		B. Biofuels	22PCH4CCC3B						
		C. Bioinorganic Chemistry	22PCH4CCC3C						
	Core Practical - VI (CP)	Physical Chemistry - II (P)	22PCH4CC6P	6	5	6	40	60	100
	Generic Elective Course-II (GEC)	Corrosion and Pollution Management	22PCH4GEC2	3	2	3	25	75	100
	Project	Project Work	22PCH4PW	9	5	-	-	100	100
Total				30	21				500
Grand Total				120	92				2200

Courses & Credits for PG Science Programmes

S. No	Courses	No. of Courses	No. of Credits	Marks
1.	Core Course – (CC)	6	30	600
2.	Core Choice Course– (CCC)	3	12	300
3.	Core Practical - (CP)	6	30	600
4.	Discipline Specific Elective- (DSE)	3	09	300
5.	Generic Elective Course - (GEC)	2	04	200
6.	Project	1	05	100
7.	Internship	1	02	100
	Total	22	92	2200

The internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e.30 marks)
- The passing minimum not less than 50% in the aggregate.

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e.24 marks)
- c) The passing minimum not less than 50% in the aggregate.

For Project:

Marks for Dissertation: 80

Marks for Viva Voce : 20

Total marks : 100

Internal Component (Theory)

Component	Marks
Library	05
Assignment & Seminar	10
CIA -I	05
CIA-II	05
Total	25

Internal Component (Practical)

Component	Marks
Observation	05
Record	10
Continual performance	10
Model	15
Total	40

Question Paper Pattern**PART A (10X2=20)**

Answer all the questions

PART B (5X5=25)

Answer all the questions

PART C (3X10=30)

Answer any three questions

Semester I	InternalMarks:25	ExternalMarks:75		
COURSECODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH1CC1	ORGANIC CHEMISTRY-I	CORE	6	5

Course Objectives

- To learn the basic concepts of aromaticity and stereochemistry of various organic molecules
- To give ideas of nucleophilic and electrophilic substitution reactions and makes to learn about the oxidizing and reducing reagents for organic synthesis.

Prerequisites

Aromaticity, substitution, oxidation, reduction and symmetry

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and summarize the fundamentals of aromaticity, stereochemistry, selection rules and reagents inorganic synthesis.	K1,K2
CO2	Interpret the concept to Huckels theory, conformation analysis, substitution, FMO method, oxidation and reduction reactions.	K3
CO3	Categorize the aromaticity, configuration, reactivity and reagents.	K4
CO4	Evaluate aromatic character, stereoanalysis, pathway of reactions and catalysis.	K5
CO5	Predict the conditions and product of substitution mechanism, Pericyclic reactions and suitable reagents in redox reactions.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO 5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Electronic Effects and Aromaticity: Electronic Effects-inductive, resonance and hyperconjugative effects and their influence. Aromatic character: Huckel's theory of aromaticity - three, four, five, six, seven and eight membered rings—other systems with aromatic sextet – concept of homo aromaticity and anti-aromaticity-Craig's rule and its applications. Consequences of aromaticity. non-alteration in bond length-Huckel's MO calculation. Electron occupancy in MO's and aromaticity NMR concept of Aromaticity and anti-aromaticity.</p>	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
II	<p>Stereochemistry and Conformational Analysis: Stereoisomerism – optical activity and chirality – types of molecules exhibiting optical activity – R, S and E, Z configuration, absolute configuration chirality in molecules with non-carbon stereocenters (N, S and P) Molecules with more than one chiral center. Stereochemistry of molecules with axial chirality. Biphenyls, allenes, spiranes and analogues- Atropisomerism - Helicity and chirality - Resolution – methods of Resolution. Conformations of mono and disubstituted six membered ring systems conformations of decalin. Quantitative correlation between conformation and reactivity.</p>	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	<p>Aliphatic Substitution Reactions: Aliphatic Electrophilic substitution: selected reactions- migration of double bonds-halogenation of aldehydes and ketones - Stork-Enamine reaction-decarboxylation</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

	of aliphatic acids-Haloform reaction. Aliphatic nucleophilic substitution-mechanisms-SN1,SN2,SNi-ion-pair mechanisms - neighboring group participation ,non-classical Carbocations–substitutions at allylic and vinylic carbons. Reactivity effect of substituents, nucleophilic, leaving group and stereo chemical factors -correlation of structure with reactivity-solvent effects-Von Braun Reaction. Claisen and Deickmann condensation.			
IV	Pericyclic Reactions: Concerted reactions –orbital symmetry and concerted symmetry –Woodward and Hoffmann rules–selection rules for electrolytic reactions–frontier molecular orbital approach correlation diagram–examples–Chelotropic and ene reactions. Sigmatropic rearrangements – 1,3, 1,5and1,7-hydrogenshifts–examples–Cope and Claisen rearrangements–1,3-dipolar cycloadditions reactions.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,K5,K6
V	ReagentsinOrganicSynthesis: Oxidation:Jacobsen epoxidation, Shiepoxidation, Jonesreagent, PCC, PDC, DMP, Seleniumoxide, Swern oxidation, Sommelet reaction, Elbs reaction, Prevost reaction and Woodward modification. Reduction: palladium / platinum rhodium/nickel based heterogeneous catalysts for hydrogenation, Noyori asymmetric hydrogenation. Red-Al, NaBH ₄ and NaCNBH ₃ ,trialkylsilanes andtrialkylstannane.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4,K5,K6

VI	Self-Study for Enrichment: (Not to be included for External Examination) Rules of resonance–tautomerism–steric effects– Enantiomers and diastereomers–SE1 and SE2 and SEi mechanisms–selection rules for cycloaddition reactions Thermal and photochemical reaction of pericyclic reaction– MCPBA reagent and Wilkinson’s catalyst.		CO1, CO2 CO3	K1, K2, K3, K4
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Text Books

1. Mukherji, S.M Singh, S.P. (2015). Reaction Mechanism in Organic Chemistry (Revised Edition): Trinity; New Delhi.
2. Kalsi, P.S. (1993). Stereochemistry. Wiley eastern limited; New Delhi.
3. Jagdamba Singh. (2016). Organic synthesis: Pragati Prakashan.
4. Bansal, R.K. (1975). Organic Reaction Mechanisms. Tata McGraw Hill.

Reference Books

1. March and Smith, M.B March’s Advance Organic Chemistry Reactions, Mechanisms and Structure, 7th Edition. (2013), Wiley, New York.
2. Finar, I.R, Organic Chemistry Vol. II 7th edition. (2009), Pearson, New Delhi.
3. Nasipuri, D, Stereochemistry of Organic Compounds Principles, 2nd Edition. (2002), New Age International and applications.
4. Lowry, T.H.E and Richardson, K. S, Mechanism and Theory in Organic chemistry, 3rd edition. (1997), Benjamin Cummings Publishing, USA.
5. Carey, F. A and Sundberg, R.J, Advanced Organic chemistry Part A and B, 5th edition. (2007), Springer, Germany.

Web References

1. [https://hithaldia.in/faculty/sas_faculty/Dr_Gora_Das/Class%20Notes%20\(CH-101%20&CH-201\)%20Module-4%20\(Structure%20&%20reactivity%20of%20Organic%20Molecules\).pdf](https://hithaldia.in/faculty/sas_faculty/Dr_Gora_Das/Class%20Notes%20(CH-101%20&CH-201)%20Module-4%20(Structure%20&%20reactivity%20of%20Organic%20Molecules).pdf)
2. http://courses.washington.edu/medch562/pdf/MEDCH400_Stereochem.pdf

3. <https://byjus.com/chemistry/substitution-reaction/>
4. <http://www.ancpatna.ac.in/departments/Chemistry/lectures/PG/Sem-II/Pericyclic%20Reactions%20By%20Dr%20Tripti%20Gangwar.pdf>
5. https://www.tcichemicals.com/assets/brochure-pdfs/Reagent_Guide_8th_Synthetic_Organic_Chemistry_Materials_Chemistry_E.pdf

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

1. Dr.P. Pungayee Alias Amirtham
2. Dr. C. Rajarajeswari

Semester I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PCH1CC2	INORGANIC CHEMISTRY-I	CORE	6	5

Course Objectives

- To articulate the learning of coordination chemistry in Inorganic Chemistry
- This subject will also create a foundation to learn inorganic photochemistry.

Prerequisites

Metals, ligands, complexes and stereoisomers

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recognize and execute the basic concepts of clusters and complexes in inorganic chemistry.	K1, K2
CO2	Sketch the synthesis of polynuclear compounds reaction mechanism of coordination compounds and their photochemical reactivity.	K2, K3
CO3	Examine the properties of clusters and coordination complexes.	K3, K4
CO4	Generalize the stabilization of clusters, kinetics of reactions, structure of metal carbonyls and ligand field photochemistry.	K5
CO5	Critical thinking on complex structure and properties of reactions.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	1	2	2	2	3	1	1	3
CO2	3	2	2	3	3	3	3	2	2	3
CO3	3	2	2	3	2	3	2	2	2	2
CO4	3	3	3	2	3	3	3	2	2	3
CO5	2	3	2	3	3	3	3	2	1	3

“1”–Slight (Low) Correlation “2”–Moderate (Medium) Correlation

“3”–Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Clusters and Polynuclear Compounds: Introduction-clusters of the p-block elements, clusters of p-block Elements in a ligand shell: Boron hydrides, Clusters in a ligand shell of the heavier elements of Group 13 and 14, Bare clusters of p-block Elements. Clusters of d-block elements, Low-valent metal clusters, Metal carbonyl clusters, Low-valent metal clusters stabilized by other π ligands, Clusters of late transition metals stabilized by phosphines.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	Principles of Coordination Chemistry: Studies of coordination compounds in solution –detection of complex formation in solution –stability constants–step wise and overall formation constants –methods of determination (potentiometric, pH metric and photometric)–factors affecting stability– statistical and chelate effects– forced configurations.	16	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	Mechanism in Coordination Complexes: Kinetics and mechanism of reactions in solution–labile and inert complexes–ligand displacement in octahedral and square planar complexes – acid hydrolysis, base hydrolysis and anation reactions. Trans effect – theory and applications – electron transfer reactions – electron exchange reactions – complementary and non-complementary types –inner sphere and outer sphere processes–application of electron transfer reactions in inorganic complexes – isomerization and racemization reactions of complexes. Molecular rearrangements of four- and six-coordinate complexes – interconversion of stereoisomers –reactions of coordinated ligands.	20	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

IV	Organometallic Compounds -Classification of organometallic compounds – structure of methyl lithium, Zeise's salt and Ferrocene- Metal carbonyls – EAN rule – Mono and poly nuclear carbonyls – preparation, reactions and structure (Ni(CO) ₄ , Fe(CO) ₅ , Cr(CO) ₆ , Mn ₂ (CO) ₁₀ , Co ₂ (CO) ₈ and Fe ₂ (CO) ₉ – Bonding in metal Carbonyls – Metal-ethylenic complexes – methods of formation – bonding – chemical properties.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	Inorganic Photochemistry: Fundamental concepts- Electronic transitions in metal complexes, metal-centered and charge-transfer transitions – various photo physical and photochemical processes of coordination compounds. Unimolecular charge transfer photochemistry of cobalt (III) complexes – mechanism of CTTM, photo reduction – ligand field photo chemistry of chromium (III) complexes – Adamson's rules, photo active excited states, V-C model – photo physics and photochemistry of ruthenium– polypyridine complexes, emission and redox properties.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self- Study for Enrichment (Not to be included for External Examination) High-valent metal Clusters and halide Clusters- Importance and applications of coordination compounds. Template effect and its applications for the synthesis of macrocyclic ligands- Fullerene Ligands and Metal complexes- Reinecke's salt chemical actinometer.		CO1, CO2	K2, K3

Text Books

1. Greenwood.(1996).Chemistry of the Elements.United Kingdom:Elsevier Science & Technology Books.
2. Kaesz,H.,Adams,R.,Shriver,D.,Kaesz,H.,Adams,R.,Shriver,D.(1990).The Chemistry of Metal Cluster Complexes.

3. Sharma, L. R., Puri, B. R., Sharma, L. R., Puri, B. R. (1976). Principles of Inorganic Chemistry:
For B.Sc. and B.Sc.(Hons.) Classes of Indian Universities. India: S. Nagin.
4. Day, M.C., Selbin, J., Day, M.C., Selbin, J. (1976). Theoretical Inorganic Chemistry.
5. Cotton, F.A., Wilkinson, G., Cotton, F.A., Wilkinson, G. (2007). Advanced Inorganic Chemistry, 6th Edition. India: Wiley India Pvt. Limited.
6. Keiter, E.A., Keiter, R.
Medhi, O.K., Huheey, J.E., Keiter, E.A., Keiter, R.L., Medhi, O.K., Huheey, J.E. (2006). Inorganic Chemistry: Principles of Structure and Reactivity. India: Pearson Education.
7. Arthur W. Adamson, Paul. D. (1975). Fleischauer, Concepts of Inorganic Photochemistry. United Kingdom: Wiley.
8. Kettle, S. F. A., Kettle, S. F. A. (2019). Physical Inorganic Chemistry: A Coordination Chemistry Approach. Germany: Springer Berlin Heidelberg.

Reference Books

1. J.D. Lee, Concise Inorganic Chemistry, 5th Edition. (2008). India: Wiley India Pvt. Limited.
2. Gurdeep Raj, Advanced Inorganic Chemistry Vol-1 (2020). Krishna Prakashan.
3. Ferraudi, G. J., Ferraudi, G. J. (1988). Elements of Inorganic Photochemistry.
United Kingdom: Wiley.
4. Pearson, R. G., Basolo, F., Pearson, R. G., Basolo, F. (1967). Mechanisms of Inorganic Reactions:
A Study of Metal Complexes in Solution. United Kingdom: Wiley.
5. Sharma, R.K., Sharma, R.K. (2007). Inorganic Reaction Mechanisms. India: Discovery Publishing House.

Web References

1. https://www2.chemistry.msu.edu/courses/cem151/chap24lect_2019.pdf
2. <http://www.vpscience.org/materials/Unit%203%20B%20Coordination%20chemistry.pdf>
3. https://www.usb.ac.ir/FileStaff/2896_2019-4-18-0-9-32.pdf
4. <https://www.uou.ac.in/sites/default/files/slm/BSCCH-101.pdf>
5. <https://www.chem.uci.edu/~lawm/11-16.pdf>
6. https://www.usb.ac.ir/FileStaff/5269_2018-9-18-10-21-39.pdf

Pedagogy

Chalk and talk,PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

Dr.K.Shenbagam

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH1CC3	PHYSICAL CHEMISTRY-I	CORE	6	5

Course Objectives

- To understand the principles of quantum chemistry and group theory
- To learn about the theories of reaction rates, kinetics of reactions in solution phase and catalysis
- To study in detail the basic concepts of statistical thermodynamics.

Prerequisites

Diatomic, rigid rotator and symmetry operations

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	On the successful completion of the course students will be able to Re-phrase and discuss the basic concepts of quantum mechanics, group theory, Kinetics of reactions, catalysis and statistical thermodynamics.	K1 & K2
CO2	Illustrate an insight on quantum mechanical operators, character table, and theories of reaction rate, adsorption isotherm and Maxwell's distribution law.	K3
CO3	Analyze and interpret particles in box, Applications of HMO theory, orthogonality theorem, kinetics of complex reaction, enzyme catalysis, types of statistical thermodynamics.	K4
CO4	Evaluate the energy of particles in a box, Symmetry operations, factors influencing reaction rate, kinetics of enzyme catalysis, partition functions for diatomic molecules.	K5
CO5	Develop and write wavefunction for hydrogen like particles, character table, Michaelis Menten equation, and quantum statistics.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	1	1	3
CO2	2	2	1	2	2	3	3	1	2	2
CO3	3	3	2	3	3	3	3	2	1	3
CO4	3	2	2	2	2	2	2	2	2	2
CO5	3	3	2	3	3	3	3	2	2	3

"1" – Slight (Low) Correlation

"3" – Substantial (High) Correlation

"2" – Moderate (Medium) Correlation

"-" indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Quantum Theory: Concept of operators-sums and products of operators-commutator-linear and non-linear operators-Hermitian and Hamiltonian Operators- postulates of quantum mechanics-.Applications Schrodinger wave equation to free particle-particle in a one-dimensional box, simple linear harmonic oscillator and its limitations, Rigid rotator- model for a rotating diatomic molecule-solutions.SolvingofSchrodingerequationfortheH-atom(orH-likespecies)-energylevels.Introduction to the methods of self – consistent field. Virial theorem - Huckel theory of conjugated systems, bond order and charge density calculations, Application to ethylene, 1, 3-butadiene, and benzene.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	Group Theory: Definition of a mathematical group and its properties – multiplication table -cyclic groups-subgroups - classes – symmetry elements - symmetry operation – classes of symmetry operations-classification of molecular point groups. Matrix representations of symmetry operations-representation of groups-reducible and irreducible representations. Great Orthogonality theorem and its consequences- character tables – construction of character tables for C _{2v} and C _{3v} point groups.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	Kinetics of Complex and Fast Reactions: Theories of reaction rates- absolute reaction rate theory-thermodynamic formulation of ARR theory-Lindeman’s theory of uni molecular reactions. Chain reactions-characteristics, kinetics of decomposition of acetaldehyde (Rice-Herzfeld scheme), photochemical reaction of H ₂ -Br ₂ ·Thermal reaction-non-stationary chain reaction, H ₂ -O ₂ reactionandexplosionlimits.Effectoftemperature,relativepermittivity,ionicstrength,andsolvent(Grunwald Weinstein equation) on reaction rates. Reactions in solutions-effect of pressure,	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

	dielectric constant, and ionic strength on reactions in solutions.			
IV	Surface chemistry and catalysis: Adsorption: physisorption and chemisorption, Gibb's adsorption isotherm - Langmuir theory, kinetic and statistical derivation, multi-layer adsorption BET theory, Use of Langmuir and BET isotherms for surface area determination. Application of Langmuir adsorption isotherm in surface catalyzed reactions. Catalysis by enzymes - Kinetics of enzyme-catalyzed reaction - Michaelis - Menten equation and its interpretation. Effect of substrate concentration, pH and temperature on enzyme-catalyzed reactions - inhibition of enzyme-catalyzed reactions - Competitive, Non-competitive and uncompetitive inhibition.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	Statistical Thermodynamics: Calculation of thermodynamic probability of a system- micro and macro states-different methods of counting macro states - distinguishable and indistinguishable particles, classical statistics- derivation of Maxwell-Boltzmann distribution law. Physical significances of translational, rotational, vibrational, electronic partition functions -application to monoatomic and diatomic molecules. Quantum statistics-Bose-Einstein and Fermi-Dirac distribution equations comparison of B.E and F.D statistics.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self-Study for Enrichment (Not to be included for External Examination) Eigen values and Eigen functions- physical interpretation of wave function- orthogonality and normalization theorems-space group and Schoen flies symbol for point group-kinetics of fast reactions-flow method and relaxation methods-comparison of physisorption and chemisorption and types of adsorption isotherms-difference between thermodynamic and statistical probability.	-	CO1, CO2	K2 K3

Text Books

1. Akins, P.W. (2008). Physical Chemistry. Oxford, UK. Oxford University Press, 8th Edition.
2. Puri, Sharma, Pathania, (2019). Principle of Physical Chemistry. Jalandhar, India. Vishal publication & Co. 47th Edition.
3. Grutu, J.N. & Grutu, A. (2015). Advanced Physical Chemistry. Pune, India. Pragathi publisher, 18th Edition.

Reference Books

1. Prasad, R.K. (2006). Quantum Chemistry. New Delhi, India. New Age International (P) Ltd., Revised 3rd Edition.
2. Albert Cotton, F. (2008). Chemical Applications of Group Theory. New Delhi, India. Wiley India Pvt Ltd publisher, 3rd Edition.
3. Laidler, K.J. (2003). Chemical Kinetics. New Delhi, India. Tata Mcgraw Hill, Revised 3rd Edition.
4. Gupta, M.C. (2011). Statistical Thermodynamics. New Delhi, India. New Age International (P) Ltd., 3rd Edition.

Web References

1. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=13G8VouhmrFfuhs6rkiyTA>
2. <https://www.chem.tamu.edu/rgroup/hughbanks/courses/673/lecturenotes/lecturenotes.html>
3. <http://www.kpgcollege.org/admin/upload/1586604901.pdf>
4. <https://youtu.be/ALwziZSRiqM>
5. <https://youtu.be/ACY-Wbudg0o>
6. <https://youtu.be/yO8v0nszUz8>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. V. Sangu

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PCH1CC1P	ORGANIC CHEMISTRY-I (P)	CORE	6	5

Course Objectives

- To perform the qualitative analysis of a given organic mixture and to carry out the preparation of organic compounds.

Pre requisites

Separation of components, Qualitative analysis

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Apply the principles of separation in organic mixtures.	K1
CO2	Prepare the organic compounds by single stage method.	K2
CO3	Identify various functional group in organic compounds.	K3
CO4	Develop skills in separating techniques	K3
CO5	Analyze the nature of organic mixture containing two components.	K4

Mapping of CO with PO and PSO

CCOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO 1	3	2	2	2	2	2	1	3	2	1
CO2	2	3	2	2	2	3	2	1	3	2
CO3	2	3	3	2	3	1	1	1	2	1
CO4	3	2	2	3	2	2	3	2	3	2
CO5	2	3	3	3	2	1	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

I. QUALITATIVE ANALYSIS OF AN ORGANIC MIXTURE CONTAINING TWO COMPONENTS

Mixtures containing two components are to be separated (pilot separation) and purified(bulk separation).

II PREPARATION OF ORGANIC COMPOUNDS (SINGLE STAGE)

1. Methyl-*m*-nitrobenzoate from methylbenzoate (nitration)
2. Glucose pentaacetate from glucose(acetylation)
3. Resacetophenone from resorcinol(acetylation)
4. Benzophenone oxime from benzophenone (addition)
5. *o*-Chlorobenzoic acid from anthranilic acid (Sandmayer reaction)
6. *p*-Benzoquinone from hydroquinone (oxidation)
7. Phenylazo-2-naphthol from aniline(diazotization)

Text Books

1. Mohan.J (2003), Organic Analytical Chemistry: Theory and Practice, Narosa
2. Ahluwalia.V.KBhagat.P , And Agarwal.R (2005), Laboratory Techniques in Organic Chemistry, I.K. International

Reference Books

1. Gnanaprakasam, N.S and Ramamurthy.G(1987), Organic Chemistry Lab Manual,S.V.Printers
2. Vogel.A.IT atchell. A.RFurnissB.SHannaford.A.JandSmithP.W.G, (1989), Vogel's Textbook of Practical Organic Chemistry, 5th Ed., PrenticeHall

Web References

1. <https://authors.library.caltech.edu/25034/10/BPOCchapter9.pdf>
2. <http://do.chem.uni.wroc.pl/system/files/Preparatory%20classes.pdf>.

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS

Pedagogy

Demonstration and practical sessions

Course Designers

- ❖ Dr.P.Pungayee Alias Amirtham
- ❖ Dr.R.Subha

22PCH1DSE1AP	INSTRUMENTATION TECHNIQUES (P)	DISCIPLINE SPECIFIC ELECTIVE	6	3
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Course Objectives

- Gain proficiency in the use of analytical pipettes, volumetric measurements, and analytical instruments.
- Learn how to correctly use a UV/Vis spectrophotometer.
- Gain familiarity with a new technique.
- Perform quantitative analytical methods including titrations, pH measurements, spectrophotometry, and chromatography.

Prerequisites

Chromatography, qualitative analysis and spectroscopy

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Become familiar with fundamental concepts of instruments.	K1
CO2	Observe the application of Instrumentation Techniques	K2
CO3	To be trained in lab safety, preparation of solutions numerically.	K4
CO4	Develop the core skills to parse existing chromatographic protocols and identify the key factors influencing a chromatography experiment	K5
CO5	To develop students' ability and skill to acquire expertise in calibration techniques.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	2	3	2	3	3
CO2	2	2	2	1	2	2	2	3	2	2
CO3	3	2	2	2	2	1	2	2	2	2
CO4	3	2	3	2	2	3	2	2	2	3
CO5	2	3	2	3	3	2	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

1. Use and calibration of volumetric equipment (volumetric flasks, pipette's and burette's).
2. Separation of monosaccharide present in a given mixture by paper chromatography.
3. Determination of chlorine in water using colorimetry.
4. Analysis of soil
 - i) Determination of pH of soil.
 - ii) Determination of total soluble salts by conductometry
5. Measurement of pH of different solutions like aerated drinks, fruit juices, shampoos and soaps (use dilute solutions of soaps and shampoos to prevent damage to the glass electrode) using pH-meter.
6. Separation of a mixture of metals by TLC .
7. Determining the concentration of citric acid in soft drink using titration.
8. Determination of equilibrium constant by colorimetry.
9. Verification of Beer-Lambert's law by colorimetry.
10. Determination of ascorbic acid in lime juice by titration.
11. Spectrophotometric determination of iron in vitamin tablets.
12. Estimation of aspirin from tablet using titration method.
13. Determination of strength of commercial vinegar by conductometry.
14. Analysis of potassium permanganate by UV/visible spectrophotometer.
15. Estimation of sugar by titrimetric method.

TextBooks

1. Fifeild, F.W. (2011). Principles and Practice of Analytical Chemistry. United States: Springer US.
2. Lundanes, E., Reubsæet, L., Greibrokk, T., Lundanes, E., Reubsæet, L., Greibrokk, T. (2013). Chromatography: Basic Principles, Sample Preparations and Related Methods. Germany: Wiley.
3. Franson, S., Mary, H. (2007). Standard Methods for the Examination of Water and Wastewater. United States: American Public Health Association.

ReferenceBooks

1. Harris, D. C. (2012). Exploring Chemical Analysis: International Edition. United Kingdom: Macmillan Learning.
2. Dilts, R. V. (2010). Analytical Chemistry: Methods of Separation. United Kingdom: Van Nostrand.
3. Harris, D. C., Lucy, C. A. (2019). Quantitative Chemical Analysis. United States: W. H. Freeman.

4. Mikeš, O., Mike S, O., Chalmers, R. A. (2007). Laboratory Handbook of Chromatographic Methods. United Kingdom: Van Nostrand.

Web References

1. <https://www.epa.gov/sites/default/files/2015-12/documents/9214.pdf>
2. [https://chem.libretexts.org/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/General_Chemistry_Labs/Online_Chemistry_Lab_Manual/Chem_10_Experiments/11%3A_Titration_of_Vinegar_\(Experiment\)](https://chem.libretexts.org/Ancillary_Materials/Laboratory_Experiments/Wet_Lab_Experiments/General_Chemistry_Labs/Online_Chemistry_Lab_Manual/Chem_10_Experiments/11%3A_Titration_of_Vinegar_(Experiment))
3. https://www.lacitycollege.edu/Departments/Chemistry/documents/Chemistry-101-Experiments-Documents/E12B_titration2016
4. https://www.uobabylon.edu.iq/eprints/publication_10_11891_250.pdf

Pedagogy

Table Work

CourseDesigner

1. Dr. G. Sivasankari.

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22PCH1DSE1BP	NANOSCIENCE AND NANOTECHNOLOGY (P)	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- Covers the whole spectrum of nanomaterials ranging from overview, synthesis, properties, and characterization of nano phase materials to application including some new developments in various aspects.
- Provides an introduction to the theory and practice on Nanomaterials and various techniques used for the fabrication and characterization of nanostructures.

Prerequisites

Precipitation, reduction and absorption methods.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	To foundational knowledge of the Nanoscience and related fields	K1
CO2	Understand in broad outline of Nanoscience and Nanotechnology.	K2
CO3	Acquire an understanding the Nanoscience and Applications	K3
CO4	Apply principles of basic science concepts in understanding, analysis and prediction of matter at Nano scale.	K3
CO5	Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment	K2 & K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	1	3	2	2
CO2	2	3	2	3	2	3	2	1	3	2
CO3	2	3	3	2	3	1	1	2	2	1
CO4	3	2	2	3	2	2	3	2	2	2
CO5	2	3	3	3	2	1	2	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

1. Synthesis of CuO nano particles by sonochemical method
2. Synthesis of ZnO nano particles by sonochemical method
3. Synthesis of Carbon nano particles by Microwave Irradiation Method.
4. Characterization of nanoparticles by UV- Visible Spectrophotometer.
5. Synthesis of Silver Nanoparticles by Chemical reduction method and their UV-VIS absorption studies.
6. Synthesis of Iron Oxide Nanoparticles by Polyol method and their UV-VIS absorption studies.
7. Synthesis of ZnO Nanoparticles by Co-Precipitation Method.
8. Preparation of thiolated silver nanoparticles.
9. Synthesis of Nanoparticles from plant materials by Sonochemical Method.

TextBooks

1. Edelstein, A.S., Cammaratra, R.C. (2017). Nanomaterials: Synthesis, Properties and Applications, Second Edition. United Kingdom: Taylor & Francis.
2. Wiederrecht, G. (2010). Handbook of Nanofabrication. Italy: Elsevier Science.
3. Altavilla, C., Ciliberto E.(2017). Inorganic Nanoparticles: Synthesis, Applications, and Perspectives. United Kingdom: CRC Press.

ReferenceBooks

1. Fritzsche, W., Köhler, M., Fritzsche, W., Köhler, M. (2008). Nanotechnology: An Introduction to Nanostructuring Techniques. Germany: Wiley.
2. Muller, A., A.K., Cheetham., Rao C.N.R. (2006). The Chemistry of Nanomaterials: Synthesis, Properties and Applications. Germany: Wiley.

Web References

1. https://www.researchgate.net/publication/229419482_Sonochemical_synthesis_size_controlling_and_gas_sensing_properties_of_NiO_nanoparticles
2. <https://www.sciencedirect.com/science/article/pii/S1569441018301445>

3. <https://pubs.rsc.org/en/content/articlelanding/2019/nj/c9nj01360a>
4. https://www.researchgate.net/publication/231240704_UreaMelt_Assisted_Synthesis_of_NiNiO_Nanoparticles_Exhibiting_Structural_Disorder_and_Exchange_Bias

Pedagogy

Table Work

CourseDesigners

1. Dr. G. Sivasankari
2. Dr. R. Subha

Semester I	Internal Marks:40	External Marks:60		
COURSECODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22PCH1DSE1CP	BIOCHEMISTRY (P)	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To expert the student to identify and isolate various biomolecules.
- To acquire training to estimate the quantity of biomolecules present by applying biochemical techniques.

Prerequisites

Chromatographic techniques, biomolecules and plant pigments.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Recall and understand the techniques involved in isolation, separation and estimation of various biomolecules	K1 & K2
CO2	Develop and apply the skills in handling various chromatographic and colorimetric techniques	K3
CO3	Qualitatively and quantitatively analyze the biomolecules	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	3	2	2	3	2	2	3
CO2	3	3	2	3	3	3	3	2	2	3
CO3	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

I EXTRACTION OF BIOMOLECULES

- * Starch from potato.
- * Casein from milk.
- * Oil from oil seeds.
- * Cellulose from plant material.

II BIOCHEMICAL TECHNIQUES

- * Identification of amino acid by circular and ascending paper chromatography.
- * Separation of amino acids and carbohydrates in a mixture by paper chromatography.
- * Separation of lipids by thin layer chromatography.
- * Separation of a mixture of proteins and salt by column chromatography.
- * Separation of plant pigments using Chromatography techniques - TLC, Paper chromatography.

III QUALITATIVE ANALYSIS OF BIOMOLECULES

- * Carbohydrate—Glucose,Fructose,Sucrose,LactoseandStarch.
- * Proteins – Precipitation reactions of proteins, Colour reactions of proteins, colourreactions of amino acids like tryptophan, tyrosine, cysteine, methionine, arginine,prolineand histidine.
- * Lipids—solubility,acroleintest,Salkowskitest,Lieberman-Burchardtest.
- * Qualitative tests for nucleic acid.

IV COLORIMETRIC ESTIMATION

- * Glucose by DNS method.
- * Protein by Biuret/Bradford and Lowry's method.
- * Uric acid.
- * Urea by DAM method.
- * Creatinine by Jaffe's method.
- * Phosphorous by Fiske and Subbarow's method.

Text Books

1. Rajan,S.&SelviChristy.R.(2018).ExperimentalProceduresinLifeSciences.CBSPublishers & Distributors.
2. Wilson, K.&Walker,J.(2000).Principles and Techniques of Practical Biochemistry. Fifth edition. Cambridge University Press.
3. Upadhyay & Upadhyay Nath(2016).Biophysical Chemistry:Principles and Techniques. Himalaya Publishing House.

Reference Books

1. Hofmann, A. &Clokie, S. (2018). Wilson and Walker's Principles and Techniques ofBiochemistryand MolecularBiology.8thedition.CambridgeUniversityPress.
2. Wood,W. B.(1981).Biochemistry-Aproblem Approach.Addison Wesley.

Web References

1. http://nec.edu.np/Publications/Chemistry_LAB_Manual/Experiment%204.pdf
2. https://www.mlsu.ac.in/econtents/1616_Biochemical%20Tests%20of%20Carbohydrate,%20protein,%20lipids%20and%20salivary%20amylase.pdf
3. https://webstor.srmist.edu.in/web_assets/srm_mainsite/files/files/2%20ESTIMATION%20OF%20PROTEIN%20BY%20LOWRY.pdf
4. <https://orbitbiotech.com/estimation-of-reducing-sugars-by-dnsa-method/>
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8575183/>
6. <http://atlas-medical.com/upload/productFiles/208011/Creatinine%20Package%20Insert.pdf>

Pedagogy

Demonstration and practical sessions

Course Designers

1. Dr. P. Pungayee Alias Amirtham
2. Dr.S.Saranya

Semester II	InternalMarks:25	ExternalMarks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CC4	PHYSICAL METHODS IN CHEMISTRY-I	CORE COURSE	6	5

Course Objectives

- To understand, Microwave Spectroscopy and Vibrational Spectroscopy
- To learn IR and UV-Vis spectroscopy
- To study NMR & EPR spectroscopy
- To learn, mass and ORD techniques

Prerequisites

Electromagnetic radiation, molecular energy level, Rigid rotor, selection rules for spectroscopy

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand principle of various spectral techniques involving molecular absorption of electromagnetic radiations.	K1, K2
CO2	Apply NMR, IR, MS, UV-Vis spectroscopic techniques in solving structure of organic molecules and in determination of their stereochemistry	K3
CO3	Explain the principle, rules to analyses, compare and identify the structure of organic molecules using various spectral techniques.	K4
CO4	Discriminate structural and stereoisomers of compounds, radical and radical ion from adsorption pattern of molecules.	K5
CO5	Evaluate and identify configuration and conformation of isomers.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	1	1	3	3
CO2	3	2	1	3	2	2	3	3	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Theoretical principles of Molecular Spectroscopy:</p> <p>Microwave spectroscopy – rotational spectra of diatomic molecules, rigid and nonrigid rotors, - Intensity of spectral lines, - Effects of isotopic substitution - Stark effect. Applications of microwave spectroscopy - determination of bond length and atomic mass from microwave spectra.</p> <p>Infrared Spectroscopy: Linear harmonic oscillator-vibrational energies of diatomic molecules - zero point energy- force constant and bond strengths – anharmonicity- Morse potential energy diagram- vibration-rotation spectroscopy. Basic instrumentation, selection rules -normal modes of vibration - group frequencies - overtones - Fermi resonance - hot bands - factors affecting the band positions and intensities – problems - Hydrogen bonding (intermolecular and intramolecular). and NIR</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	<p>Electronic spectroscopy: Franck-Condon principle – Selection Rules for Electronic Transitions Vibrational and rotational fine structure- Predissociation- spectroscopic determination of dissociation energy Electronic spectra of diatomic molecules – solvent effect - decay of an electronically excited state-photophysical processes, Jablonsky diagram, fluorescence and phosphorescence, excited state lifetime and quantum yield -fluorescence quenching- quenching by excimer and exciplex emission- fluorescence resonance energy transfer between photoexcited donor and acceptor system.</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

III	Raman and UV-Visible Spectroscopy: Raman spectra – Rotational Raman spectra of linear and symmetric top molecules – Vibrational Raman spectra, Rotational fine structure. Rayleigh and Raman scattering, Stokes and anti-Stokes lines Fortrait diagram - applications of Raman spectroscopy. UV-Visible Spectroscopy: Introduction- Instrumentation, Sampling techniques - Woodward–Fieser and Scott rules for conjugated dienes and polymers, ketones, aldehydes, α,β -unsaturated acids, esters- identification of geometrical isomers and positional isomers.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	NMR Spectroscopy: ^1H NMR spectroscopy – origin of NMR spectra – chemical shift – number of signals – peak areas – multiplicity – geminal, vicinal and long-range couplings – factors affecting chemical shifts and coupling constants, Karplus equation, AX, AX ₃ , AB ₂ , AMX and ABX pattern of first order spectra (problems in spin - spin splitting pattern), Simplification of complex spectra– Double resonance techniques, shifts reagents – an elementary treatment of NOE phenomenon. Carbon NMR spectroscopy: ^{13}C NMR Spectroscopy — Broad band decoupling – Off resonance decoupling ^2D Techniques: $^1\text{H}^1\text{H}$ COSY – $^1\text{H}^{13}\text{C}$ COSY and NOESY.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

V	NQR, X-Ray, Electron and Neutron Diffraction: Characteristics of quadrupolar nucleus – Effects of field gradient and magnetic field upon quadrupolar energy levels – NQR transitions – Applications of NQR spectroscopy. X-Ray diffraction by single crystal method – spacegroups – systematic absences in X-ray data and identification of lattice types, glide planes and screw axes – Electron diffraction by gases – scattering intensity vs. scattering angle, Wierl equation – measurement techniques. Neutron diffraction by crystals – magnetic scattering – measurement techniques – elucidation of structure of magnetically ordered unit cell.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Problems based on joint application of UV, IR, PMR, CMR, and Mass. (Including reaction sequences), DEPT, INTEPT, Chemical spin decoupling of rapidly exchangeable protons (OH, SH, COOH, NH, NH ₂).	-	CO2, CO3, CO4	K3 K4 K5

Text Books

1. Banwell. C.N., (2017). Fundamentals of molecular Spectroscopy, 4th edition, McGraw Hill, New Delhi.
2. Silverstein.P.M., & Western.F.X., (2014). Spectroscopic Identification of Organic compounds. 8th edition, John Wiley, New York.
3. Kalsi.P.S., (2016). Spectroscopy of Organic Compounds. 7th edition, New Age International Publishers, New Delhi.
4. William Kemp., (2019). Organic spectroscopy. 3rd edition, Macmillan publisher Pvt, Bangalore.

Reference Books

1. Drago. R.S., (2012). Physical Methods in Inorganic Chemistry. Affiliated East-West press Pvt. Ltd, New Delhi.
2. Kaur. K., (2014). Spectroscopy. 16th edition, Pragati Prakashan Educational Publisher.
3. Sharma. Y. R., (2016). Elementary organic spectroscopy. revised 4th edition, S. Chand & Co Ltd, New Delhi.
4. Jan Fleming., & Dudley Williams., (2020). Spectroscopic Methods in Organic Chemistry, 7th edition, Tata McGraw-Hill Education, India.

Web References

1. <http://www.organic-chemistry.org/>
2. <http://www.organicworldwide.net/>
3. <http://www.ccdc.cam.ac.uk/products/csd/>
4. <http://www.nou.ac.in/econtent/Msc%20Chemistry%20Paper%20IX/MSc%20Chemistry%20Paper-IX%20Unit-5.pdf>
5. <http://www.rcsb.org/pdb/home/home.do>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. **Dr.V.Sangu**

Semester II	InternalMarks:40	ExternalMarks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CC2P	ORGANIC CHEMISTRY-II (P)	CORE PRACTICAL	6	5

Course Objectives

To perform the quantitative analysis of a given organic compounds and to carry out the preparation of organic compounds.

Prerequisites

Hydrolysis, Acetylation, bromination, nitration and oxidation/ reduction

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the qualitative estimation and double stage preparation of organic compounds.	K2
CO2	Apply the methods and interpret results, while observing responsible and ethical scientific conduct.	K3
CO3	Analyze qualitatively organic components in the environment by hands-on experience with latest technical instrumentation.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	1	3	2	1
CO2	2	3	2	2	2	3	2	1	3	2
CO3	2	3	3	2	3	1	1	1	2	1

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-” indicates there is no correlation

Syllabus

I QUANTITATIVE ANALYSIS OF ORGANIC COMPOUNDS

1. Estimation of phenol
2. Estimation of aniline
3. Estimation of ketone
4. Estimation of glucose
5. Estimation of nitrobenzene
6. Estimation of glycine
7. Estimation of iodine value of oil

II PREPARATION OF ORGANIC COMPOUNDS (DOUBLE STAGE)

1. Acetylsalicylic acid from methyl salicylate (hydrolysis and acetylation)
2. 1,3,5-Tribromobenzene from aniline (bromination, diazotization and hydrolysis)
3. p-Nitroaniline from acetanilide (nitration and hydrolysis)
4. Benzilic acid from benzoin (rearrangement)
5. p-Aminobenzoic acid from p-nitrotoluene (oxidation and reduction)
6. Benzanilide from benzophenone (rearrangement)
7. m-Nitroaniline from nitrobenzene (nitration and reduction)

Text Books

1. Mohan.J (2003), Organic Analytical Chemistry: Theory and Practice, Narosa
2. Ahluwalia.V.KBhagat.P&Agarwal.R (2005), Laboratory Techniques in Organic Chemistry, I.K. International

Reference Books

1. Gnanaprakasam, N.S&Ramamurthy.G(1987), Organic Chemistry Lab Manual,S.V.Printers
2. Vogel.A.IT atchell. A.R, Furniss B.S, Hannaford.A. J &SmithP.W. G, (1989), Vogel's Textbook of Practical Organic Chemistry, 5th Ed., Prentice Hall.

Web References

1. <http://rushim.ru> › books › praktikum › Mann
2. <http://do.chem.uni.wroc.pl/system/files/Preparatory%20classes.pdf>.

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. K. Shenbagam

Semester II	InternalMarks:25		ExternalMarks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CCC1A	ORGANIC CHEMISTRY-II	CORE CHOICE COURSE	6	4

Course Objectives

- To learn about the effect of structure on reactivity.
- Enable the students to acquire surplus knowledge about the addition, elimination mechanism, and the chemistry behind the photolytic reactions.
- Guide the students to know the role of heterocyclic compounds in drug development.

Prerequisites

Quantitative treatment, Substitution, Addition, Elimination, photoreaction and Heterocycles.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Outline the synthesis, reactivity of organic compounds, various methods for determining the mechanism and fundamentals of photochemistry.	K1&K2
CO2	Interpret the reaction mechanism of various organic reactions including photochemical and heterocycles.	K3
CO3	Classify the different types of substitution, addition, elimination, photolytic reactions and heterocyclic compounds.	K4
CO4	Categorize the techniques of investigating reaction pathways and naming reactions.	K5
CO5	Predict the mechanism and products of organic reactions	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	2	1	1	3
CO2	3	2	1	3	2	3	3	1	1	2
CO3	3	3	2	1	2	3	3	2	2	3
CO4	3	3	2	2	3	3	3	2	2	3
CO5	3	3	2	3	3	3	2	1	1	2

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Effect of Structure on reactivity: Quantitative treatment : Hammett equation- linear free energy relationship, substituent constant and reaction constant and limitations of Hammett equation, Taft equation, thermodynamically and kinetically controlled reactions, Hammond's postulate, Non- kinetic methods of determining mechanism- isolation, trapping and detection of intermediates, isotopic labelling, crossover experiments, product analysis, stereo chemical evidence, kinetic method -kinetic isotope effect.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	Aromatic Nucleophilic and Electrophilic Substitution: SN1, SNAr, Benzyne mechanism, reactivity and orientation, Ullmann, Sandmeyer and Chichibabin reaction, Steven's – Sommelet Hauser and Von Richter Rearrangements. Aromatic electrophilic substitution – orientation, reactivity and mechanism based on transition state theory with suitable reactions. Ortho- para ratio, ipso attack, Vilsmeier- Haack, Jacobson and Scholl's reactions.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	Addition and Elimination: Addition to carbon-carbon multiple bonds - Electrophile, nucleophile and free radical addition, addition to carbonyl and conjugated carbonyl system-mechanisms. Knoevengal, Stobbe, Darzen'sglycidic ester condensation and Reformatsky reaction. Elimination reaction- Mechanism of E1, E2, E1CB, stereochemistry, Hoffmann's and Zaitsev's rules. Pyrolytic cis elimination, Chugaev reaction, Hoffmann exhaustive methylation, Cope elimination and Bredt's rule.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6

IV	Organic Photochemistry: Fundamental concepts, energy transfer, characteristic of photoreaction - photo-reduction, photo-oxidation and photosensitization. Classification of photoreactions of Ketones and enones- Norrish type I and II, Paterno-Buchi reaction, Photo-Fries rearrangement. Photochemistry of alkenes and aromatic compounds – Zimmerman’s Di- π methane rearrangement. Reaction of unactivated centres- Photochemistry of α,β - unsaturated carbonyl compounds, Barton Reaction.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	Heterocycles: Nomenclature, synthesis and reactivity of aromatic heterocycles – pyrazole, isothiazole, triazole, pyrimidine, purines, triazines, pyridazines and pyrazines. Synthesis and reactivity of non-aromatic heterocycles – tetrahydro furan, pyrrolidine, piperidine, oxirane, oxetane, oxazole and imidazole	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self-Study for Enrichment (Not to be included for External Examination) Reactivity of intermediates, nature of substituents, Markovnikov’s and Anti-Markovnikov’s rule, syn-anti addition and elimination, Jablonski diagram and chemistry of simple heterocycles.	-	CO1 CO2 CO3	K1 K2 K3 K4

Text Books

1. Pine S.H, Hendrickson J B, Cram & Hammond, (1980), Organic Chemistry, 4th edition McGraw Hill, New York.
2. March J & Smith M.B (2020), Advanced Organic Chemistry, Reactions, mechanisms and Structure, 8th edition Wiley.
3. Carey F A & Sundberg R J, (2007), Advanced Organic Chemistry, Part A and Part B, 5th Corrected edition Springer.
4. Bansal. R .K, (1990), Reaction mechanism in Organic Chemistry, Tata McGraw Hill.
5. Finar I.L, (2009), Organic Chemistry, 6th edition, Pearson Education Ltd.

Reference Books

1. Peter sykes (2009), A guide book to mechanism in Organic Chemistry, 6th edition, Pearson Education.
2. Education.
3. Raj K Bansal. (2009), Heterocyclic Chemistry, 4th edition, New Age International Publishers.
4. Gurdeep.R. Chatwal, (2015), Reaction Mechanism and Reagents in Organic Chemistry, Himalaya Publishing House.

Web References

1. <https://chemicalnote.com/reaction-mechanism-methods-of-determining-reaction-mechanism/>
2. <https://www.chemistrylearner.com/addition-reaction.html>
3. <http://www-oc.chemie.uni-regensburg.de/OCP/ch/chb/oc5/Photochemie-08.pdf>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. P. Pungayee Alias Amirtham

Dr. A. Sharmila

Semester II	InternalMarks:25	ExternalMarks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CCC1B	CHEMISTRY OF NATURAL PRODUCTS	CORE CHOICE COURSE	6	4

Course Objectives

- By the end of this course the student will be familiar with definition, isolation and uses of natural products.
- The students will be able to know the general properties and methods of preparation of natural products chemically and biosynthetically.

Prerequisites

Isolation, addition, elimination, substitution,oxidation,reduction reactions.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Differentiate the different types of alkaloids, terpenes, steroids, flavonoids and vitamins.	K1
CO2	Know the basic terms in natural product chemistry and their physiological significance.	K2
CO3	Evaluate the different methods of preparation of natural products	K3
CO4	Recognize the most important building blocks employed in the biosynthesis of natural products.	K4
CO5	Elaborate general methods of structural elucidation of compounds of natural origin.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Alkaloids: Classification of alkaloids, general methods of structural determination of alkaloids, synthesis and biogenesis of Papaverine, Adrenaline, Ephedrine, Piperine, Hygrine and Reserpine	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Terpenoids and Carotenoid: Classification of terpenoids, isoprene rules- structural elucidation & synthesis of geraniol, α -pinene and camphor. Diterpenoids: Carotenoid- Introduction- Structure and Synthesis of β -Carotene and Lycopene.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Steroids: Introduction and nomenclature of steroids, Blanc's rule, Barbier-Wieland degradation, Oppenauer oxidation, Diel's hydrocarbon, chemistry of Cholestrol, Ergosterol and Vitamin-D.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Flavonoids and Isoflavonoids: Occurrence, nomenclature and general methods of structure determination, isolation, structure elucidation and synthesis of Kaempferol, Quercetin, Cyanidin, Genestein.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
V	Vitamins: Classification and structure of water soluble and fat soluble vitamins, plant and animal sources, vitamins as coenzymes, deficiency of vitamins and their effects.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

VI	Self-Study for Enrichment (Not to be included for External Examination)	-	CO2	K2
	Definition, isolation and purification of alkaloids, terpenes, and flavonoids.		CO3	K3

Text Books

1. Chatwal G.R, (1990), Natural Products Chemistry-Vol. I & II, Himalaya Bombay.
2. Agarwal, O.P, Goel Gorakhpur (1985), Chemistry of Natural Products-Vol. I & II:
3. Longmann E.L, London B.S, (2000), Organic Chemistry-Vol. I-II: I. L. Finar.
4. Sujatha V. Bhat, Nagasampige B.A & Sivakumar M, (2006), Chemistry of Natural Products:, 2nd reprint, Springer.

Reference Books

1. Dewick P.M (2009), Medicinal Natural Products: A Biosynthetic Approach", 2nd Edition, Wiley & Sons,
2. Graham Solomons T.W, Craig B. Fryhle, Scott A. Snyder (2013), Organic Chemistry, 11th Edition, International Student Version, John Wiley & Sons..Himalaya Publishing House.

Web References

1. <https://chemnote.weebly.com/uploads/2/5/8/6/25864552/alkaloids.pdf>
2. <https://www.vedantu.com/biology/steroid>
3. <https://www.slideshare.net/TareqAspirant/a-short-note-on-vitamins>
4. <https://www.tuscany-diet.net/2014/01/22/flavonoids-definition-structure-classification>
5. <https://www.intechopen.com/chapters/62573>
6. <https://gcwgandhinagar.com/econtent/document/1588068142ch-1.pdf>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo ,Quiz, Seminar

Course Designers

1. Dr. C.Rajarajeswari

Semester II	InternalMarks:25	ExternalMarks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CCC1C	MOLECULAR REARRANGEMENT	CORE CHOICE COURSE	6	4

Course Objectives

- To learn about the reactions intermediates involved in rearrangement reactions.
- To learn about the basic concepts about the electrophilic and nucleophilic rearrangement reactions.
- To learn the concept and mechanism of rearrangement reactions.

Prerequisites

Reaction intermediates, nitrenes, carbenes, electrophilic, nucleophilic, naming reactions.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	On the successful completion of the course, students will be able to know the outline for determining nature of rearrangements.	K1, K2
CO2	Interpret the reaction mechanism in various organic reactions.	K3
CO3	Classify the different types of intermediates involving in organic rearrangement reactions.	K4
CO4	Recognize the technique of identifying reaction mechanism in various naming reactions.	K5
CO5	Predict the mechanism and product of molecular rearrangement reactions.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	2	3	1	1	1	3
CO2	3	2	1	3	2	2	3	1	1	2
CO3	3	3	1	1	2	3	2	2	2	3
CO4	3	3	2	2	3	3	2	1	2	3
CO5	3	3	2	3	3	3	3	2	1	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Molecular Rearrangements – Introduction, intermolecular and intra molecular rearrangement, intermediates, classification based on migration origin and migration terminus.</p> <p>Rearrangement to electron-deficient carbon - Wagner-Meerwein rearrangement, pinacol rearrangement, Wolff rearrangement, benzil-benzilic acid rearrangement-Allylic rearrangement-Sommelet-Hauser rearrangement-Tiffeneau-Demjanov Rearrangement.</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	<p>Rearrangement to electron-deficient nitrogen: Beckmann rearrangement- Schmidt rearrangement, Hofmann rearrangement-Curtius rearrangement- Lossen rearrangement-Neber rearrangement- Stieglitz Rearrangement- Rearrangements with acyl carbenes-Arndt-Eistert Reaction- Diazo Ketone Reactions</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	<p>Rearrangement to electron-deficient oxygen: Baeyer-Villiger oxidation, cumene hydroperoxide rearrangement-phenol rearrangement-Dakin reaction- free radical rearrangements.</p> <p>Sigmatropic rearrangement – classification, [1,2] shift, [1,3] shift and [3,3] shift - Claisen rearrangement, cope rearrangement</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	<p>Migration from N- to ring carbon rearrangement: Hoffmann Martius rearrangement- Orton rearrangement – Benzidine -semidine rearrangement – Bamberger rearrangement- Migration to electron rich carbon center – Fries rearrangement – Favorski rearrangement.</p>	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

V	Aromatic and Photochemical rearrangement	18	CO1	K1
	Stevens rearrangement-Wittig rearrangement-		CO2	K2
	Photochemical rearrangement – di -pi methane		CO3	K3
	rearrangement		CO4	K4
			CO5	K5
VI	Self-Study for Enrichment (Not to be included for External Examination)	-	CO1	K1
	Aldol condensation-allylic rearrangement-ullmann reaction-sandmeyer reaction-perkin reaction.		CO2	K2 K3

Text Books

1. Tewari, .K.S, Vishil, N.K, &Mehotra N.S (2001), A text book of org. chem – 1st edition, Vikas Publishing House Pvt Ltd., New Delhi.
2. Soni P.L (2005), Text Book of Organic chemistry, Sultans Chand, 1991, New Delhi,
3. Bahl& Arun Bahl (2005), Organic Chemistry, S. Chand and Sons, New Delhi.
4. Agarwal O.P (2002), Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House.
5. Gurdeep Chatwal (2002), Chemistry of Organic Natural Products, Vol 1 and 2, Goel Pub. House..

Reference Books

1. Sharma, Y.R &Vig O.P (1997), Elementary organic absorption spectroscopy – 1st edition, Goel Pulishers, Meerut.
2. Morrison R.T & Boyd R.N (1992), Organic Chemistry, 6th edition, PHI Limited, New Delhi.
3. Jerry March (1992), Advanced Organic Chemistry, 4th edition, John Wiley and Sons, New York.
4. Pine S.H (1987), Organic Chemistry, 5th edition, McGraw Hill International Edition, Chemistry Series, New York.

Web References

1. <https://www.masterorganicchemistry.com/2012/08/15/rearrangement-reactions-1-hydride-shifts>
2. <https://www2.chemistry.msu.edu/faculty/reusch/virttxtjml/rearrang.htm>
3. https://chem.libretexts.org/Bookshelves/Organic_Chemistry/Book%3A_Virtual_Textbook_of_Organic_Chemistry
4. <https://www.organic-chemistry.org/namedreactions/claisen-rearrangement.shtm>

Pedagogy

Chalk and talk, PPT, E-content, Discussion, Assignment, Demo ,Quiz, Seminar

Course Designers

1. Dr. K. UmaSivakami

Semester II	InternalMarks:40	ExternalMarks:60		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2CC3P	INORGANIC CHEMISTRY -I (P)	CORE PRACTICAL	6	5

Course Objectives

- To perform the semi-micro qualitative analysis and to estimate the metal ions using photoelectric colorimeter.

Prerequisites

Eperation of cations and anions, quantitave analysis

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the quantitative estimation and estimation of inorganic compounds.	K2
CO2	Apply the methods, identify the components and interpret results, while observing responsible and scientific conduct.	K3
CO3	Analyze quantitatively organic components in the environment by hands-on experience with latest technical instrumentation	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	2	1	3	2	1
CO2	2	3	2	2	2	3	2	1	3	2
CO3	2	3	2	2	2	1	1	1	2	1

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

1. Semi-micro qualitative analysis of a mixture containing two common cations (Pb, Bi, Ca, Cd, Fe, Cr, Al, Co, Ni, Mn, Zn, Ba, Sr, Ca, Mg,) and two less common cations (W, Tl, Se, Te, Mo, Ce, Th, Zr, Ti, V, U, Li).
2. Quantitative Estimation of copper, iron, nickel, chromium and manganese ions using photoelectric colorimeter

Text Books

1. Vogel, A.I (2000), Text Book of Quantitative Inorganic Analysis, Longman.
2. Ramanujam V.V (1988), Inorganic Semimicro Qualitative Analysis, National Pubs.
3. Svehla, G. (1987), Text Book of Macro and Semimicro Qualitative Inorganic analysis, Longman.

Reference Books

1. Vogel, A.I, Atchell, A.R, Furniss B.S, Hannaford, A. J & Smith P.W. G, (1989), Vogel's Textbook of Practical Organic Chemistry, 5th Ed., Prentice Hall.

Web References

1. [https://iscnagpur.ac.in/study_material/dept_chemistry/4.1 MIS and NJS Manual for Inorganic semi-micro qualitative analysis](https://iscnagpur.ac.in/study_material/dept_chemistry/4.1_MIS_and_NJS_Manual_for_Inorganic_semi-micro_qualitative_analysis)
2. <https://byjus.com/chemistry/systematic-analysis-of-cations>
3. <https://www.uou.ac.in/sites/default/files/slm/MSCCH-505L.pdf>

Pedagogy

E-content, Demo, Hands on training

Course Designers

1. Dr. K. Shenbagam

Semester II	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2DSE2A	GREEN CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To know about twelve principles of green chemistry, eco-friendly synthesis using microwave, ionic liquid and phase transfer catalyst.
- To know the synthesis of organic compounds in greener way.
- To gain knowledge about the use of environmentally friendly practices in reducing pollution.

Prerequisites

Pollution, hazardous chemicals, toxic chemicals. Catalyst, condensation, substitution, elimination, oxidation, reduction.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the basics of green chemistry and introduction of organic synthesis.	K1
CO2	Understand the importance and role of solvents, solid-state reactions, phase transfer catalyst and alternative energy sources.	K2
CO3	Apply green synthesis for synthesizing different organic compounds.	K3
CO4	Analyze the applications of green synthesis.	K4
CO5	Create a new route for the synthesis of organic compounds from the knowledge gained throughout the course.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	2	2	2	2
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction to Green Chemistry: Need of Green Chemistry- twelve principles of green chemistry. Planning a green synthesis- percentage atom utilization - Evaluating the type of the reaction - selection of solvents-selection of starting materials- use of catalyst. International organisations promoting green chemistry.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Organic Synthesis in Green Solvents: Reactions in water - pericyclic reactions, Wittig-Horner reaction, Knoevenagel reactions, Pinacol coupling, Aldol condensation, Benzoin condensation, Heck reaction, Wurtz reaction and Mannich reactions. Organic synthesis in supercritical carbon dioxide -Diels-Alder reaction and Kolbe-schmitt synthesis. Reaction in ionic liquids – types, preparations and synthetic applications.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Organic Synthesis in Solid State: Introduction, room temperature solid state reactions - Grignard reaction, Reformatsky reaction. Solid state reactions on heating – oxidations of hydroxylated aldehydes, ketones, nitriles, sulfides and nitrogen heterocycles. Solid state reactions using solid support – oxidation, reduction, rearrangement, isomerization and condensation reactions.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Alternate Energy Processes in Chemical Synthesis: Microwave assisted organic synthesis - hydrolysis of benzyl chloride and benzamide and coupling reactions - Baylis - Hillman reaction, Esterification, synthesis of chalcones. Ultrasound assisted organic synthesis - homogenous sonochemical reactions - Curtius rearrangement, organometallic reactions- Heterogenous	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5

	liquid-liquid reactions and solid-liquid reactions.			
V	Phase Transfer Catalysts: Mechanism of phase transfer reaction, types and advantages of phase transfer catalyst. Applications of phase transfer catalyst in organic synthesis - Darzen reaction, Michael addition, oxidation reactions using permanganate, chromate, hypochloride, osmium tetroxide, potassium ferricyanide and peroxides and reduction reactions	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Properties of CO ₂ - Phase diagram for CO ₂ - uses of CO ₂ in dry cleaning. Synthesis of quinoxaline derivatives and β-keto sulfones from ketones using green synthesis. Instrumentation and types of sonochemical reaction in ultrasound assisted green synthesis.	-	CO1 CO2	K1 K2

Text Books

1. Kumar, V. (2007) An Introduction to Green Chemistry. Vishal Publishing Co. Jalandhar.
2. Ahluwalia. V. K. An Introduction to Green Chemistry. Narosa Publishing.
3. Anastas. P. T., and Warner, J. C. (2008). Green Chemistry. Oxford University Press.

Reference Books

1. Ahluwalia. V. K., and Kidwai, M. (2007). New Trends in Chemistry. Anamaya Publishers. 2nd Edition.
2. Ahluwalia. V. K., and Varma, R. S. (2009). Green Solvents. Narosa Publishing. 1st Edition.

Web References

1. <https://www.epa.gov/greenchemistry/basics-green-chemistry>.
2. <https://pubs.rsc.org/en/content/articlelanding/2005/gc/b418069k>.
3. [https://www.scielo.br/j/jbchs/a/Fzh57FB7TrhBWRLnzkCCfDs/?lang=en#:~:text=The%20solid%2Dphase%20organic%20synthesis%20\(SPOS\)%20has%20emerged%20as,chemistry%20to%20discover%20new%20hits.&text=In%20SPOS%2C3%20the%20solid,to%20drive%20reactions%20to%20completion](https://www.scielo.br/j/jbchs/a/Fzh57FB7TrhBWRLnzkCCfDs/?lang=en#:~:text=The%20solid%2Dphase%20organic%20synthesis%20(SPOS)%20has%20emerged%20as,chemistry%20to%20discover%20new%20hits.&text=In%20SPOS%2C3%20the%20solid,to%20drive%20reactions%20to%20completion).

4. <https://www.organic-chemistry.org/topics/sonochemistry.shtm>.
5. <https://www.sciencedirect.com/topics/chemistry/phase-transfer-catalyst>.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

Dr. S.Devi,

Semester II	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2DSE2B	FORENSIC CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To know about the history and principles involved in Forensic science
- To demonstrate proficiency in accurately conveying scientific data for crime cases.
- To develop testable hypothesis, designing and analysis of collected sample to solve criminal justice system.

Prerequisites

Finger print analysis, Crime detection in Gold, Food and soil

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	To know the fundamental principles, technological methods and functions of forensic science	K1 & K2
CO2	Apply the principles of Spectroscopy in physical evidences and beverages	K3
CO3	Illustrate the mechanism persisting in identification of evidences, finger prints and explosives	K4
CO4	Appraise the role of chemistry in detection of corrupted jewels, explosives and consumed liquors	K5
CO5	Design the role of handwriting exemplars, alcoholic beverages, marked currency notes and hidden explosives	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	3	2	3	3	3	2
CO2	2	3	3	3	2	3	3	2	3	3
CO3	2	3	3	3	2	3	2	3	3	3
CO4	2	2	2	3	3	2	3	2	3	2
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low) Correlation

“2”–Moderate (Medium) Correlation

“3”–Substantial (High) Correlation

“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	CONGNITIVE LEVEL
I	INTRODUCTION OF FORENSICSCIENCE: Functions of forensic science-Historical aspects - definitions and concepts in forensic science-scope of forensic science-need of forensic science-basic principles of forensicscience-branchesofforensicscience-forensic sciencein internationalperspectives.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	CHEMISTRYOFFORENSIC INVESTIGATIONS: Definition, Classification -physicalevidence- Glass and soil - physical properties - comparing glass fragments - collection andpreservation of glass evidence - forensic characteristics of soil - collection and preservation ofsoilevidence.Fingerprints-fundamentalprinciples -classificationofmethods of detecting fingerprints - preservation of developed prints. Document and voiceexamination - collection of handwriting exemplars - typescript comparisons - inks and papers - alterations,erasures,andobliterations.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	TECHNOLOGICALMETHODSINFORENSICSCIENCE: Chromatographic methods-Fundamental principles and forensic applications of thin layerchromatography-gaschromatographyandliquidchromatography. Spectroscopicmethods-Fundamental principles and forensic applications of Ultraviolet- visible spectroscopy, infraredspectroscopy,atomicabsorptionspectroscopy,atomicemissionspectroscopyandmassspectroscopy.X-rayspectrometry. Colorimetric analysis andLambert-Beerlaw.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	FORGERYANDCOUNTERFEITING: Detecting forgery in bank cheques / drafts and educational	18	CO1 CO2	K1 K2

	records (mark lists, certificates) using UV-light. Alloy analysis using AAS to detect counterfeit coins. Checking Silverline water mark in currency notes. Jewellery: detection of gold, purity in 22 carat ornaments, detecting gold plated jewels, authenticity of diamonds, (natural, synthetic, glassy).		CO3 CO4 CO5	K3 K4 K5 K6
V	STUDY OF BEVERAGES AND EXPLOSIVES: Definition-classification of liquors based on origin (Indian made foreign products, Country made)- Methods-Fermentation and Distillation process- Characterization of Beer, wines, Congeners in alcoholic beverages. Explosives-Definition and chemistry of explosives- characteristics of high and low explosion, dust explosion- Gas/vapour explosion- Detection of hidden explosives- Examination of explosives and explosion residues using chemical and instrumental techniques.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
VI	Self-Study for Enrichment (Not to be included for External Examination) Case studies on crime cases related to documentation, money and mobile data hacking	-	CO1 CO2	K1 K2 K3

Text Books

1. Jay.A. Seigel (2015), Forensic Chemistry: Fundamentals and Applications, Wiley Publications.
2. Suzanne Bell, (2022), Forensic Chemistry, CRC Press
3. Syed Aftab Iqbal (2021), Textbook of Forensic chemistry, Discovery Publishers Ltd

Reference Books

1. Kenyon Evans Nguyen (2021), Forensic Chemistry, American chemical society.

2. Anthony J.Bertino (2019), Forensic Science: Fundamentals and Investigations, Cenage Publishers

Web References

1. <https://www.pdfdrive.com/introduction-to-forensic-chemistry-e189712545.html>
2. <https://www.degruyter.com/document/doi/10.1515/9783110718812/html?lang=en>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. Dr. R.Subha

Semester II	InternalMarks:25	ExternalMarks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
22PCH2DSE2C	ANALYTICAL CHEMISTRY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To acquire the knowledge of basic principles and theory behind analytical techniques.
- To know the separation of chemical compounds from mixtures.
- To gain knowledge about the application of analytical techniques to analysis chemical compounds.

Prerequisites

Adsorption, elution, solubility, Electromagnetic radiation.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe the basic concepts of data analysis, chromatography, electroanalytical methods, thermal methods and flame photometry.	K1
CO2	Understand the theory of various analytical techniques.	K2
CO3	Illustrates the instrumentation and experimental details of analytical techniques.	K3
CO4	Compare various analytical techniques based on their principles and applications.	K4
CO5	Evaluate the applications of data analysis, chromatography, electroanalytical methods, thermal methods and flame photometry.	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	3	3	3	3	3	2	3
CO2	3	3	2	3	3	3	3	3	2	3
CO3	3	3	2	3	3	3	3	3	2	2
CO4	3	3	2	2	3	3	3	2	2	2
CO5	3	3	2	3	3	3	3	3	2	3

“1”–Slight (Low)Correlation

“2”–Moderate(Medium)Correlation

“3”–Substantial (High)Correlation

“-”indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction To Analytical Chemistry: Analytical chemistry - role of analytical chemistry, classification, advantages and limitations of analytical methods - Safety in laboratory. Errors - Types, definitions of relative error, absolute error, significant figures, mean, median, standard deviation, sensitivity, detection limits, precision and accuracy. Confidence limit, test of significance - Q - test, F - test and T - test. Linear least squares methods. Minimisation of errors. Sampling, standardisation and calibration in analytical methods.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
II	Chromatography I: Chromatography -Introduction, definition, types, principles and theories. Principle, experimental details, theory, advantages, limitations and applications of paper chromatography, thin layer chromatography, liquid - liquid partition chromatography, column chromatography.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
III	Chromatography II: Introduction, principle, instrumentation, advantages, limitations and applications of gas chromatography, gel permeation chromatography, ion exchange chromatography. Principle, instrumentation and applications of high performance liquid chromatography, gas chromatography - mass spectroscopy and liquid chromatography - mass spectroscopy techniques.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
IV	Electroanalytical Methods: Definitions and terminology involved in electrochemistry. Types of	18	CO1 CO2	K1 K2

	electrodes - ion selective electrode, glass membrane electrode, solid and liquid membrane electrodes. Principle, instrumentation, titrations, advantages and application of potentiometry, conductometry and coulometry. Principle, instrumentation, advantages and applications of polarography, cyclic voltammetry and amperometric titrations.		CO3 CO4 CO5	K3 K4 K5
V	Thermal Methods and Flame Photometry: Thermogravimetry - Introduction, principle, instrumentation, derivative thermogravimetry analysis, factors affecting TGA and applications of TGA for quantitative analysis of calcium carbonate, copper sulphate pentahydrate and calcium oxalate hydrate. Differential thermal analysis - Introduction, principle of working, factors affecting DTA and applications. Flame photometry - Introduction, principles, instrumentation, advantages, limitations and applications	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5
VI	Self-Study for Enrichment (Not to be included for External Examination) Methods of expressing accuracy and precision- Electrogravimetry - Calibration - Thermometric titrations - Interference and effect of solvent in flame photometry - Flame infrared emission.	-	CO1 CO2 CO3	K1 K2 K3

Text Books

1. Skoog, D. A., West, D. M., & Holler, H. J. (1992). Fundamentals of Analytical Chemistry.
2. Chatwal, G. R., and Anand, S. (1999). Instrumental Method of Analysis. Himalya Publishing House, 13th reprint.
3. Srivastava, A. k., and Jain, P. C. Instrumental Approach to Chemical Analysis.
4. Allen J. Bard and Larry R. Faulkner. Electrochemical Methods: Fundamentals and Applications.

Reference Books

1. Skoog, D. A., Holler, F. J., and Crouch, R. (2006). Principles of Instrumental Analysis. 6th Edition.
2. Vogel's Textbook of Quantitative Chemical Analysis, Pearson Education. 6th Edition.
3. Kaur, H. Instrumental Methods of Chemical Analysis. Pragati Edition.

Web References

1. <https://www.simplilearn.com/data-analysis-methods-process-types-article>
2. <https://www.britannica.com/science/chromatography>
3. <https://microbenotes.com/high-performance-liquid-chromatography-hplc/>
4. [https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_\(Analytical_Chemistry\)/Instrumentation_and_Analysis/Cyclic_Voltammetry](https://chem.libretexts.org/Bookshelves/Analytical_Chemistry/Supplemental_Modules_(Analytical_Chemistry)/Instrumentation_and_Analysis/Cyclic_Voltammetry).
5. <https://soe.unipune.ac.in/studymaterial/ashwiniWadegaonkarSelf/621%20Unit%202.pdf>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar

Course Designer

1. Dr. S. Devi



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with A Grade by NAAC
ISO 9001:2015 Certified
Annamalai Nagar, Trichy -18.
PG & Research Department of Computer Science

MINUTES OF THE SEVENTH MEETING OF THE BOS

DATE: 14.10.2022

VENUE: CS Lab & GMeet

TIME: 10.30 am

Members Present:

1. Dr. V. Sinthu Janita Prakash	Chairperson, Professor & HoD
2. Dr. D. I. George Amalarethnam	University Nominee
3. Dr. L. Robert	Subject Expert, Other University
4. Dr. N. Sasikala Devi	Subject Expert, Other University
5. Prof. Kumar Rengasamy	Special Invitee
6. Mr. Laxmi Narasimhan Varadhan	Placement Representative from Industry
7. Dr. S. Deepa	Alumna
8. Ms. N. Girubagari	Member
9. Ms. A. Sahaya Jenitha	Member
10. Ms. K. Pradeepa	Member
11. Dr. D. Radhika	Member
12. Dr. K. Reka	Member
13. Ms. S. Udhayapriya	Member
14. Ms. P. Muthulakshmi	Member
15. Ms. K. Sangeetha	Member
16. Ms. R. Rita Jenifer	Member
17. Ms. V. Kavitha	Member
18. Ms. R. Sangeetha	Member
19. Ms. S. Saranya	Member
20. Ms. G. Sujatha	Member
21. Ms. R. Ramya	Member
22. Ms. R. Vinodhini	Student Representative
23. Ms. R. Kalapana	Student Representative

The leave of absence was granted to:

1. Mr. Stephen Moses Dhinakaran	Nominated BoS Member from TCS
2. Dr. Smitha Shivshankar	International Expert
3. Ms. N. Agalya	Member

ACTION TAKEN REPORT OF SIXTH BOS HELD ON 05.05.2022

The Chairman of the BoS read the minutes of the Sixth meeting of BoS which was held on 05.05.2022,

and the following resolutions were confirmed

- III Semester syllabus of B.Sc Computer Science with Cognitive Systems for 2021-2022 Batch
- PSO, Programme Structure and I Semester Syllabus of 2022-2023 batch and onwards framed for
 - B.Sc Computer Science
 - B.Sc Computer Science with Cognitive systems
 - M.Sc Computer Science
- The syllabus for the Allied Courses I & II offered for other departments of 2021-2022 batch
- Panel of examiners and question paper setters

MINUTES OF THE SEVENTH MEETING OF BOS HELD ON 14.10.2022

The following Resolutions were passed by the BoS members

RESOLUTION NO. BOS/07/01

Resolved to approve the Programme Structure (Six semesters) of **B.Sc. Computer Science** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

- Prof.Kumar Rengasamy, Prof L Robert and Dr Deepa suggested to bring Data Structures Course before DBMS.
- Mr.Laxmi Narasimhan Varadhan suggested to include CCNF(Cloud Native Computer Foundation) in **Cloud Computing Course** and also to reduce the syllabus
- Prof. Kumar Rengasamy suggested to convert **Discipline Specific Elective -III(DSE) – Open Source Technologies Practical** as one of the core practical.
- Dr. D. I. George Amalarethinam suggested to include LAMP (Linux, Apache, MYSQL, PHP/ Perl/ Python) in the **Open Source Technologies Practical** course.

Resolved to carry out the changes in the Programme Structure as given in Annexure A

RESOLUTION NO. BOS/07/02

Considered and approved the ratification of I Semester syllabus of **B.Sc. Computer Science** for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**

RESOLUTION NO. BOS/07/03

Resolved to approve the II Semester syllabus of **B.Sc. Computer Science** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**

1. Core Practical II (CP) -Java Programming Practical (22UCS2CC2P)

- Dr. Deepa Suggested to remove Applet from the list of exercise and to include Swing in the list of programs.

2. Core Practical III (CP) – Data Visualization Practical (22UCS2CC3P)

- Dr. S.Deepa Suggested to include Microsoft Power BI in the List of Programs.
- Prof. Kumar Rengasamy suggested that students to be given basic knowledge of Data Analytics before doing practicals in Tableau and Microsoft BI

RESOLUTION NO. BOS/07/04

Considered and approved the Programme Structure(Four Semesters) of **M.Sc. Computer Science** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure C**

- Dr. L. Robert suggested to include more Programming language courses in the Programme Structure.
- Dr. D. I. George Amalarethnam suggested to include Design and Analysis of Algorithms as a core course in the Programme Structure.
- Suggestions were given to change **Core Course- VI (CC) Computer Science for Competitive Examinations (22PCS3CC6)** as an Elective instead of Core Course.
- As feedback collected by the students the syllabus will be modified for the following courses from Batch 2023-2024 and onwards
 - 1.Core Course- I(CC) **Mathematical Foundation For Computer Science (22PCS1CC1)**
 - 2.Core Course -III (CC) **Machine Learning Techniques (22PCS1CC3)**
 - 3.Discipline Specific Elective – I (**DSE) Software Testing (22PCS1DSE1C)**
- As Suggested by the students Dr.L.Robert recommended to include Angular JS and React in Core Course-II(CC) **Web Technologies ((22PCS1CC2)**
- As suggested by board members, Internship(**22PCS2INT**) can be evaluated with Internal (25 Marks) and External(75 marks) components respectively

RESOLUTION NO. BOS/07/05

Considered and approved the Ratification of I Semester syllabus of **M.Sc. Computer Science** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure D**

- As suggested by Academic council, Unit VI (self study) was introduced in all theory courses.
- APA format was followed for Text books and reference books.
- **Elective Course-I (EC)** was changed as **Discipline Specific Elective Course- I (DSE)**

RESOLUTION. BOS/07/06

Resolved to approve II Semester syllabus of **M.Sc. Computer Science** for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure D**

1. Dr.N. Sasikala Devi suggested to

- Bring R program before Python in Practical listing of **Core Practical-II (CP)- Data Mining Practical (22PCS2CC2P)**
- Change the title of the course **Discipline Specific Elective Course –II (DSE) -Network Security (22PCS2DSE2A)** as “Cryptography and Network Security” and to include the Reference Book - Cryptography and Network Security by Behrouz A. Forouzan , 2020 edition.
- Modify the Unit V of **Core Choice Course-II (CCC)- Block Chain and Crypto Currencies (22PCS2DSE2B)** with the applications of Financial and Payment related gateways and to include the reference books for Ethereum and Solidity.
- Modify the **Discipline Specific Elective Course -II(DSE)-Ethical Hacking(22PCS2DSE2C)** content of Unit VI(Self Study Enrichment) with Kali Linux topics instead of Linux.

2. The Syllabus for the II semester Courses of 2022-2023 batch were modified from the existing courses (2021-2022 batch). The topics newly included, topics removed and Unit VI (Self study) given in **Annexure E**

- **Core Course– IV (CC) Data Mining and Warehousing (22PCS2CC4)**
- **Core Course – V (CC) Design and Analysis of Algorithm (22PCS2CC5)**
- **Core Choice Course– I (CCC)**
 - A. Mobile Computing (22PCS2CCC1A)**
 - B. Wireless Sensor Networks (22PCS2CCC1B)**
 - C.MANET (22PCS2CCC1C)**
- **Discipline Specific Elective – II (DSE) –**
 - A. Cryptography and Network Security (22PCS2DSE2A)**

RESOLUTION. BOS/07/07

Resolved to approve the IV Semester syllabus of Second Allied Course-III(AC) offered by the Department of Computer Science for 2021-2022 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in

Annexure F

- Dr. L. Robert and Dr.N. Sasikala Devi suggested to reduce the syllabus

RESOLUTION. BOS/07/08

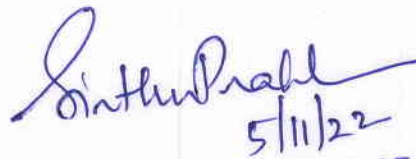
The Chairman appreciated the efforts of the members of BoS, for their valuable contribution in preparing the syllabus


14/10/22

Dr .V. Sinthu Janita Prakash
(CHAIR PERSON & H.O.D)
Dr. V.SINTHU JANITA PRAKASH
Head, PG & Research
Department of Computer Science
Cauvery College for Women
Tiruchirappalli-620 018.


14.10.2022

Dr. D. I. George Amalarethnam
(UNIVERSITY NOMINEE).


5/11/22

DEAN OF SCIENCE
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

**CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
Nationally Accredited with 'A' Grade by NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI**

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE



B.SC. COMPUTER SCIENCE

SYLLABUS

2022 -2023 and Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE**

VISION

To create an ambience for a quality academic erudition which drives technologically adept, innovative and globally competent graduates with ethical values

MISSION

- To have a breadth of knowledge across the subject areas of Computer Science
- To professionally enrich the students for successful career in Academia, Industry and Research
- To promote and inculcate ethics and code of professional practice among students

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc Computer Science.

B.Sc Computer Science with Cognitive Systems , BCA,

B.Sc Information Technology

PO NO.	On completion of B. Sc Computer Science / B. Sc Computer Science with Cognitive Systems / BCA/ B. Sc Information Technology Programme, the students will be able to
PO 1	ACADEMIC SKILLS & SOCIAL RESPONSIBILITY Apply Computing, Mathematical and Scientific Knowledge in Various disciplines by understanding the concerns of the society.
PO 2	CRITICAL THINKING AND INNOVATIVE PROGRESS Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO 3	PERSONALITY DEVELOPMENT Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO 4	LIFELONG LEARNING Identify resources for professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO 5	CREATIVITY AND HOLISTIC APPROACH Create a scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc COMPUTER SCIENCE

PSO NO.	The students of B.Sc Computer Science will be able to	POs Addressed
PSO 1	Identify, analyze, design an optimized solution using appropriate algorithms of varying complexity using cutting edge technologies	PO 1 PO 2 PO 5
PSO 2	Attain a solid foundation in the Programming languages and to formulate computational solutions to real life problems	PO 1 PO 2 PO 4 PO 5
PSO 3	Equip the skills to utilize tools and technologies in computer science to meet the industrial needs and to communicate effectively among peers	PO 3 PO 4
PSO 4	Develop skills in software and hardware so as to enable them to establish a productive career in industry, research, academia and also as an entrepreneur	PO 1 PO 4 PO 5
PSO 5	Implement independent projects of their own choice using latest tools and also work as an effective team member to attain the predefined goals.	PO 3 PO 4 PO 5



Cauvery College for Women (Autonomous), Trichy

PG & Research Department of Computer Science

B.Sc Computer Science

LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total		
							Hrs.	Marks				
								Int	Ext			
I	I	Language Course-I (LC)	Ikkala Ilakiyam	22ULT1	6	3	3	25	75	100		
			Hindi Literature & Grammar - 1	22ULH1								
			History of popular tales, Literature and Sanskrit story	22ULS1								
			Basic French - I	22ULF1								
	II	English Language Course-I(ELC)	Functional English for Effective Communication -I	22UE1	6	3	3	25	75	100		
	III	Core Course – I(CC)	Programming in C	22UCS1CC1	5	5	3	25	75	100		
				Core Practical - I (CP)	Programming in C (P)	22UCS1CC1P	3	3	3	40	60	100
				First Allied Course- I (AC)	Essential Mathematics	22UCS1AC1	4	3	3	25	75	100
				First Allied Course- II (AC)	Numerical Analysis and Statistics	22UCS1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100		
Total					30	22				700		
II	I	Language Course-II(LC)	Idaikkaala Ilakkiyamum Puthinamum	22ULT2	5	3	3	25	75	100		
			Hindi Literature & Grammar - II	22ULH2								
			Poetry, Textual Grammar and Alankara	22ULS2								
			Basic French - II	22ULF2								
	II	English Language Course-II(ELC)	Functional English for Effective Communication –II	22UE2	6	3	3	25	75	100		
	III	Core Course – II (CC)	Programming in Java	22UCS2CC2	5	5	3	25	75	100		
				Core Practical - II (CP)	Java Programming (P)	22UCS2CC2P	3	3	3	40	60	100
				Core Practical -III (CP)	Data Visualization (P)	22UCS2CC3P	3	3	3	40	60	100
				First Allied Course – III (AC)	Operations Research	22UCS2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100		
Ability Enhancement Compulsory Course-III (AECC)		Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100			
Extra Credit Course			SWAYAM	As per UGC Recommendation								
Total					30	23				800		

III	I	Language Course-III (LC)	Kaappiyamum, Naadakamum	22ULT3	5	3	3	25	75	100	
			Hindi Literature & Grammar - III	22ULH3							
			Prose, Textual Grammar and vakyarachana	22ULS3							
			Intermediate French - I	22ULF3							
	II	English Language Course-III(ELC)	Learning Grammar Through Literature- I	22UE3	6	3	3	25	75	100	
	III	Core Course– III(CC)	Data Structures & Algorithms	22UCS3CC3	6	6	3	25	75	100	
		Core Practical - IV(CP)	Data Structures (P)	22UCS3CC4P	3	3	3	40	60	100	
		Second Allied Course-I (AC)	Digital & Microprocessor Fundamentals	22UCS3AC4	4	3	3	25	75	100	
		Second Allied Course- II (AP)	Digital & Microprocessor (P)	22UCS3AC5P	4	3	3	40	60	100	
	IV	Generic Elective Course- I (GEC)	Office Automation Practical	22UCS3GEC1P	2	2	3	40	60	100	
			Basic Tamil – I	22ULC3BT1				25	75		
			Special Tamil - I	22ULC3ST1							
		Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total					30	23				700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	Pandaiya Ilakkiyamum, Urainadaiyum	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of drama Literature	22ULS4							
			Intermediate French - II	22ULF4							
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature- II	22UE4	6	3	3	25	75	100	
	III	Core Course – IV(CC)	Database Management Systems	22UCS4CC4	6	6	3	25	75	100	
		Core Practical - V(CP)	SQL & PL/SQL (P)	22UCS4CC5P	4	4	3	40	60	100	
		Second Allied Course- III (AC)	Microcontrollers	22UCS4AC6	4	3	3	25	75	100	
		Internship	Internship	22UCS4INT	-	2	-	-	-	100	
	IV	Generic Elective Course- II (GEC)	Multimedia (P)	22UCS4GEC2P	2	2	3	40	60	100	
			Basic Tamil – II	22ULC4BT2				25	75		
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course – I (SEC)	.NET Practical	22UCS4SEC1P	2	2	3	40	60	100	
		Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total					30	25				800

V	III	Core Course – V(CC)	Python Programming	22UCS5CC5	6	6	3	25	75	100
		Core Practical – VI(CP)	Python Programming (P)	22UCS5CC6P	3	3	3	40	60	100
		Core Course - VI(CC)	Operating Systems	22UCS5CC6	6	6	3	25	75	100
		Core Course – VII(CC)	Computer Networks	22UCS5CC7	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Computer Architecture	22UCS5DSE1A	5	4	3	25	75	100
			B. Computer Graphics	22UCS5DSE1B						
	C. Artificial Intelligence		22UCS5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	CISCO packet Tracer Practical	22UCS5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
Total					30	29				700
VI	III	Core Course – VIII(CC)	Cloud Computing	22UCS6CC8	6	6	3	25	75	100
		Core Course – IX(CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Core Practical –VII(CP)	Cloud Computing (P)	22UCS6CC7P	3	3	3	40	60	100
		Core Practical – VIII(CP)	Open Source Technologies (P)	22UCS6CC8P	5	5	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. Software Engineering	22UCS6DSE2A	5	4	3	25	75	100
			B. Fundamentals of Big data & IoT	22UCS6DSE2B						
			C. Open Source Technologies	22UCS6DSE2C						
	Project	Project Work	22UCS6PW	5	4	-	-	100	100	
	V	Ability Enhancement Compulsory Course-V(AECC)	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total					30	28				700
Grand Total					180	150				4400

Courses & Credits for B.Sc Computer Science Programme

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil / Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I-Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III- Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
	Total	44		150

The Internal and External marks for theory and practical courses are as follows:

Course	Internal Marks	External Marks
Theory	25	75
Practical	40	60
Internship	25	75
Project	-	100

For Theory Courses:

- a) The passing minimum for CIA shall be 40% out of 25 marks(i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks(i.e. 30 marks)

For Practical Courses:

- a) The passing minimum for CIA shall be 40% out of 40 marks(i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)

For Internship:

- a)The passing minimum not less than 40% in the aggregate

For Project Work:

- a) The passing minimum not less than 40% out of 100 marks.

Semester I	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS1CC1/ 22UCA1CC1/ 22UIT1CC1	PROGRAMMING IN C	CORE	5	5

Course Objectives

- To understand the basics of C language
- To get the deep knowledge of programming using C language
- To develop logics which will help them to create programs and applications in C
- Enhance skill on problem solving by constructing algorithms

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the basic concepts of C Programming	K1
CO2	Illustrate the components of C programming	K2
CO3	Build algorithms and data structures swiftly and faster computation using programs	K3
CO4	Apply the knowledge of programming concepts to develop programs	K4
CO5	Solve real time problems using C	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	2	3	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	3
CO4	3	2	3	2	2	2	2	2	3	3
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Developing a program in C: Algorithm-Pseudocode-Flowchart- Planning a C program- Writing a C program- Compile and Run a C Program- Overview of C: – Structure of C program – Character set-Tokens – Data types – Variables – Declaration of variables - symbolic constant – Operators and Expressions	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Managing Input and Output Operations: Reading and Writing a character -Formatted Input and Output. Decision Making and Branching: If, Switch, The ?: operator - The GoTo Instruction – Decision Making and Looping: Introduction – While, DO, For Statements –Jumps in Loops.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Array: One dimensional array – Two and multidimensional array – Character array – String functions – User-Defined Functions: Need for User -Defined Functions –A Multi-Function Program-Elements of User-Defined Functions-Definition of Functions –Return values and Their Types-Function Calls- Function Declaration- Category of Functions – Nesting of Functions - Recursion - Storage Class-The scope and lifetime of variables in functions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Structures and Unions: Structure definition – Structure Initialization – Array of structure – Array within structure –Structure within Structure-Union– Pointers: Understanding pointers - Accessing the address of a variable - Declaring and Initializing pointers - Accessing a variable through its pointers - Pointer Expressions - Pointers and Arrays - Pointers and Character strings.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	File Management: Defining and Opening File –Closing a File – I/O operations on Files – error handling during I/O operations – Random Access to Files- Command Line Arguments.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examination) Develop algorithms for real time scenario, Area calculations, Conversion programs, swapping numbers (with and without using temporary variable). Programs for checking eligibility, Triangle formation, Sum of numbers, sum of series, Array manipulations (Sorting, searching, insert, delete and merging), String handling programs, Dynamic memory management using pointers, Employee pay bill preparation using Files.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Balagurusamy.E. (2017). Programming in ANSI C, 7th Edition, Mc Graw Hill Education New Delhi.
2. Byron Gottfried. (2018). Programming with C, 4th Edition, Tata McGraw Hill.

Reference Books

1. Yashavant Kanetkar, (2020). Let Us C, 16th Edition, BPB Publications, New Delhi.
2. Ashok N. Kamthane, Amit Ashok Kamthane (2015). Programming in C, 3rd Edition, Pearson India Education Services Pvt. Ltd.

Web References

1. <https://www.learn-c.org/>
2. <https://www.cprogramming.com/>
3. <https://www.tutorialspoint.com/cprogramming/index.htm>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

1. Dr. M. Anandhi, Associate Professor, Department of Information Technology.
2. Ms. R. Sridevi, Assistant Professor, Department of Computer Applications.

Semester I	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UCS1CC1P	PROGRAMMING IN C (P)	CORE	3	3

Course Objective

- To provide the hands on experience on C Programming and improve the practical skill set
- The learner will be able to develop the logic for the given problem, recognize and understand the syntax and construction of C code
- To know the steps involved in compiling, linking and debugging C code, feel more confident about writing the C functions and some complex program

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Understand and Implement the fundamentals of C Programming	K2,K3
CO2	Analyze the problem and develop skills on identifying appropriate Programming constructs for problem solving	K3,K4
CO3	Examine the problem and provide solution using control structures And Looping statements	K4,K6
CO4	Analyze the problem and create program using arrays and functions	K4,K6
CO5	Assess and solve the problems using structures and pointers	K5,K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	2	3	2	3	3
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	2	3	3
CO5	3	3	3	3	3	3	3	2	3	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no Correlation.

List of Exercises

1. Datatypes & Operators
2. Control Statements
3. Looping Statements
4. Functions

5. Arrays
6. String Handling Functions
7. Pointers
8. Structures
9. Command line Arguments
10. Reading data from file
11. Writing data into file

Web References:

1. <https://beginnersbook.com/2015/02/simple-c-programs/>
2. <https://www.javatpoint.com/c-programs>
3. <http://www.tutorialspoint.com/cprogramming/index.htm>
4. <http://www.w3schools.in/c>
5. <http://fresh2refresh.com/c-tutorial-for-beginners>

Pedagogy:

Power Point Presentations, Demo by e-Contents

Course Designers:

1. Ms.S.Saranya
2. Ms.N.Agalya

**FIRST ALLIED COURSE –I (AC)
ESSENTIAL MATHEMATICS**

(For B.Sc Computer Science , B.Sc Information Technology & BCA)
(2022-2023 and Onwards)

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS1AC1/ 22UCA1AC1/ 22UIT1AC1	ESSENTIAL MATHEMATICS	ALLIED	4	3

Course Objective

- **Apply** the basic concepts of Differentiation, Integration and their applications.
- **Compute** mathematical quantities using ordinary and partial differential equations.
- **Explore** fundamental concepts in graph theory.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember and recall the basic concept of essential mathematics.	K1
CO2	Illustrate the various notions in the respective streams .	K2
CO3	Apply the different terminologies of essential mathematics.	K3
CO4	Classify the solution of mathematical problems using various techniques.	K4
CO5	Examine the solution of mathematical problems.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	3	3	2	2

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
 “3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Matrices</p> <p>Matrix – Special types of matrices – Scalar multiplication of a matrix – Equality of matrices – Addition of matrices – Subtraction – Multiplication of Matrices – Inverse matrix– Relation between adjoint and inverse matrices – Solution of simultaneous equations – Rank of a matrix – A system of m homogeneous linear equations in n unknowns – System of non-homogeneous linear equations – Eigen values and Eigenvectors – Similar matrices – Cayley-Hamilton Theorem (proof not needed) – Simple applications only</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Differentiation</p> <p>Maxima and Minima (Problems Only) –Points of inflexion.</p> <p>Partial differentiation</p> <p>Functions of function rule – Total Differential Coefficient – A Special case – Implicit Functions – Homogeneous functions – Euler’s Theorem (proof not needed) – Simple problems only.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Integration</p> <p>Integration of Rational algebraic functions – Rule (a) – Rule (b): Type i: $\int \frac{dx}{ax^2+bx+c}$, Type ii: $\int \frac{lx+m}{ax^2+bx+c} dx$ – Integration of Irrational functions : Case (ii) Integration of the form $\int \frac{px+q}{\sqrt{ax^2+bx+c}}$ – Type $\int \frac{dx}{a+bcosx}$ – Properties of definite integrals.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Differential Equations</p> <p>Linear Differential Equation with constant coefficients – The Operators D and D^{-1} – Particular Integral – Special methods of finding P.I.: X is of the form (a) e^{ax} (b) $\cos ax$ or $\sin ax$, where a is a constant (c) x^m (a power of x), m being a positive integer (d) $e^{ax}V$, where V is any function of x.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Graph Theory</p> <p>Introduction – Definition of Graphs – Applications of Graphs – Finite and infinite graphs – Incidence and Degree – Isolated Vertex, Pendant Vertex and Null Graph.</p> <p>Path and Circuits</p> <p>Isomorphism – Subgraphs – Walks, Paths and Circuits – Connected Graphs, Disconnected Graphs and Components – Euler graphs.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	Self-Study for Enrichment (Not included for End Semester Examination)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
	Symmetric matrix – Skew symmetric matrix – Hermitian and skew Hermitian matrices Concavity and Convexity– Integration by parts – Linear equation – Hamiltonian Paths and Circuits.			

Text Books

1. T.K.Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy.(2015). *Algebra, Volume II*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
2. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume I*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
3. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume II*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
4. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume III*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
5. Narsingh Deo. (2003). *Graph Theory with applications to Engineering and Computer*. Prentice Hall of India Private Limited

UNIT-I Chapter 2: Section 1 to 5, 7, 8, 10 to 16[1]

UNIT-II Chapter V: Section 1.1 to 1.5[2]

Chapter VIII: Section 1.2 to 1.6[2]

UNIT-III Chapter 1: Section 7.1 to 7.3, 8 (CASE II), 9, 11[3]

UNIT-IV Chapter 2: Section 1 to 4[4]

UNIT-V Chapter 1: Section 1.1 to 1.5[5]

Chapter 2: Section 2.1, 2.2, 2.4 to 2.6[5]

Reference Books

1. A.Singaravelu. (2003). *Allied Mathematics*. A.R.Publications
2. P.R.Vittal. (2014). *Allied Mathematics*. Margham Publications, Chennai.
3. S.Arumugam and S.Ramachandran.(2006). *Invitation to Graph Theory*. Sci Tech Publications (India) Pvt Ltd., Chennai

Weblinks

1. <https://youtu.be/rowWM-MijXU>
2. <https://youtu.be/TQvxWaQnrqI>
3. <https://youtu.be/pvLj1s7S0tk>
4. https://youtu.be/Gxr3AT4NY_Q
5. <https://youtu.be/xlbbefbYLzg>
6. <https://youtu.be/b0RJkIBhfEM>
7. <https://youtu.be/s5KZw1EpBEo>

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designers

1. Dr. V. Geetha
2. Dr. S. Sasikala

FIRST ALLIED COURSE-II (AC)
NUMERICAL ANALYSIS AND STATISTICS
 (For B.Sc Computer Science , B.Sc Information Technology & BCA)
 (2022-2023 and Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCS1AC2/ 22UCA1AC2/ 22UIT1AC2	NUMERICAL ANALYSIS AND STATISTICS	ALLIED	4	3

Course Objective

- **Understand** the implementation of various methods of Numerical Analysis.
- **Organize** and **summarize** the statistical data.
- **Analyze** and **evaluate** the strengths of the conclusions based on data.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the list of basic ideas of Numerical Methods and Statistics.	K1, K2
CO2	Solve the problems using various methods and also classify the given datas.	K2, K3
CO3	Identify the conceptual collection and classification of variables.	K3
CO4	Analyze the accuracy and graphical representation of statistical datas.	K4
CO5	Support the implementation of numerical methods and statistical datas.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	2
CO2	3	3	2	2	2	3	2	3	2	3
CO3	2	3	3	2	2	2	3	3	2	3
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	2	3	3	3	2	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation
 “3” – Substantial (High) Correlation “-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Solution of Algebraic & Transcendental Equations: Introduction – The Bisection Method – The Iteration Method – Newton-Raphson Method (Problems Only) Interpolation: Finite Differences: Forward Differences, Backward Differences – Newton’s Formulae for Interpolation – Interpolation with unevenly spaced Points: Lagrange’s Interpolation formula	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Numerical Integration: Numerical Integration: Simpson’s 1/3-Rule – Simpson’s 3/8-Rule (proof not needed). Linear Systems of Equations: Solution of Linear Systems–Direct Methods: Gaussian Elimination Method – Solutions of Linear Systems – Iterative Methods (Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Numerical solution of Ordinary Differential Equations: Introduction – Euler’s Method – Modified Euler’s Method – Runge-Kutta Methods – Predictor - Corrector Methods : Adams-Moulton Method	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Measures of Central Tendency: Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean. Measures of Dispersion: Mean Deviation – Standard Deviation (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	<p>Correlation: Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson’s co-efficient of Correlation – Rank Correlation: Spearman’s Rank Correlation Coefficient (Derivation not needed and Simple Problems Only).</p> <p>Linear Regression: Introduction – Linear Regression (Derivation not needed and Simple Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self Study for Enrichment: (Not included for End Semester Examination) The method of False Position & Central Differences - Trapezoidal rule - Solution by Taylor’s Series and Milne’s Method - Range – Quartile Deviation - Rank Correlation (Repeated Ranks).</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Sastry S. S. (1998). Introductory methods of Numerical Analysis, Third Edition. Prentice Hall of India Private Limited.
2. Gupta. S.C & Kapoor, V.K (2007). Fundamentals of Mathematical Statistics. Sultan Chand & sons, New Delhi.

UNIT – I Chapter 2: Sections 2.1 - 2.3(Omit 2.3.1), 2.5(Omit 2.5.1) [1]

Chapter 3: Sections 3.3 (Omit 3.3.4), 3.6, 3.9(3.9.1only) [1]

UNIT – II Chapter 5: Sections 5.4(5.4.2 & 5.4.3 only) [1]

Chapter 6: Sections 6.3(6.3.2 only) & 6.4 [1]

UNIT – III Chapter 7: Sections 7.1, 7.4- 7.6 (Omit 7.4.1 & 7.6.2) [1]

UNIT – IV Chapter 2: Sections 2.5 - 2.9, 2.13 (Omit 2.13.1 & 2.13.2) [2]

UNIT –V Chapter 10: Sections 10.1 - 10.4, 10.7(10.7.1 Only) [2]

Chapter 11: Sections 11.1 & 11.2 [2]

Reference Books

1. Jain M. K, Iyengar S. R.K. and Jain R.K. (1999). Numerical Analysis Numerical Methods for Scientific and Engineering Computations. New Age International Private Limited.
2. Froberg C.E. (1979). Introduction to Numerical Analysis. II Edition. Addison Wesley

Web Links

1. <https://youtu.be/qCzUXav5Nk>
2. <https://youtu.be/r6MTvrI8SQ4>
3. <https://youtu.be/s05dONL4xAs>
4. <https://youtu.be/XaHFNhHfXwQ>
5. <https://youtu.be/zPG4NjIkCjc>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr.R.Buvaneswari
2. Ms.A.Gowri Shankari

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS2CC2	PROGRAMMING IN JAVA	CORE	5	5

Course Objectives

- To develop logics which will help them to create programs
- To get a deep knowledge of programming using JAVA language
- To understand the basics of OOPs concepts
- Enhance problem solving skill

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Recite the basic programming skills	K1
CO2	Understand the Java features	K2
CO3	Analyze OOPs concepts	K4
CO4	Apply the programming skills in various domains	K3
CO5	Solve real time problems using Java	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	2	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Object-Oriented Programming: Basic Concepts of Object-Oriented Programming - Benefits and Applications of OOP. Java Evolution: Java Features - Java Environment - Overview of Java Language: Java Program Structures, Statements – Implementing A Java Program – Java Virtual Machine –. Constants, Variables and Data Types: Constants- Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants- Type Casting- Getting Values of Variables.	15	CO1, CO2, CO3	K1, K2, K3, K4
II	Operators and Expressions: Introduction - Arithmetic Operators- Relational Operator - Logical Operator - Assignment Operator-increment and decrement Operator-Conditional Operator - Bitwise Operator- Special Operator - Decision Making and Branching: Introduction - Decision making with if statement-Simple if statement -The if ..else Statement-Nesting of if ...else statements- The switch statement - The Conditional Operator(?:Operator) - Decision Making and Looping : While, Do, For Statement, Jump In Loops, Return Statement.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Classes, Objects and Methods: Defining A Class – Fields and Methods Declaration - Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending A Class – Overriding Methods – Final Variables, Methods and Classes – Abstract Methods and Classes – Visibility Control. Arrays, Strings and Vectors: Creating Arrays – One and two Dimensional Arrays Strings – Vectors. Interfaces: Multiple Inheritance: Introduction - Defining Interfaces - Extending Interfaces- Implementation Interfaces - Accessing Interfaces Variables.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Packages: Introduction - Java Packages - Using System Packages- Naming conventions - Creating packages - Accessing a package - Using a Package - Adding a class to a package - Multithreaded Programming: Creating Threads – Extending the Thread Class – Thread- Life Cycle of Thread-Using Thread Method-Thread Priority – Synchronization – Managing Errors and Exceptions: Introduction - Types of Errors - Exceptions-Syntax of Exception Handling code-Multiple Catch Statements.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Graphics Programming using AWT, Swing and Layout Manager: The Graphics Class- Lines and Rectangles- Circles and Ellipses-Drawing Arcs - Drawing Polygons – Introduction to AWT Package – Window Fundamentals – Layout Managers – Introduction to Swing Package – Components and Containers – AWT versus Swing - Database Connectivity: Introduction – JDBC Architecture – Discussion with Example – Overview of JDBC Components.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Comment Line Arguments – Enumerated Types - Finalizer Methods - Applet Programming: Building Applet Code - Applet Life Cycle - Creating and Executable Applet – Designing a Web Page using Applet – Managing Input/ Output Files in Java: Stream Classes – Byte Stream Classes – Character Stream Classes – Creation of Files – Reading/Writing Characters – Reading/Writing bytes.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

E. Balagurusamy,(2019). ”*Programming with JAVA*”, 6th Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books

1. S.Sagayaraj, R.Denis, P.Karthik and D.Gajalakshmi,(2017).“*Java programming*”, Universities Press.
2. Herbert Schildt, (2011).“*Java :The Complete Reference*”, 8th Edition Tata McGraw-Hill.
3. C.Muthu, (2008).”*Programming with JAVA*”, Second Edition, McGraw Hill Education
4. Ken Arnold gosling and Davis Holmen, (2005). ”*The JAVA Programming Language*”,4th Edition, Addison Wesley Pearson Education Publication.

Web References

1. <https://www.javatpoint.com/java-tutorial>
2. <https://www.guru99.com/java-tutorial.html>
3. <https://www.w3schools.com/java/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. A. Jabeen, Assistant Professor, Department of Computer Applications.

Semester II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UCS2CC2P	JAVA PROGRAMMING (P)	CORE	3	3

Course Objective

- To demonstrate the basic programming components of Java
- To learn how to apply the object oriented concepts in Java to develop stand-alone applications
- To design and develop GUI applications with appropriate database connectivity

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate and Implement the fundamentals of Java programming concepts	K2,K3
CO2	Analyze the problem and develop skills on identifying appropriate Programming constructs like looping, branching and functions	K3,K4
CO3	Examine the problem and create a reusable program by combining the features of Java such as Classes, Objects, Packages, Interfaces and Exception handling	K4,K6
CO4	Analyze the complexity of problem in real world and design an event driven and web based interactive programs using Applets	K4,K6
CO5	Build applications with database connectivity to mimic the real world scenarios	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	2	2	2	3	2	3	3
CO2	3	3	3	3	3	2	3	2	3	3
CO3	3	3	3	3	3	2	3	3	3	3
CO4	3	3	3	3	3	2	3	2	3	3
CO5	3	3	3	3	3	2	3	3	3	3

“1”-Slight (Low) Correlation
“3”-Substantial (High) Correlation

“2”-Moderate (Medium) Correlation
“-”-indicates there is no Correlation.

Exercises:

1. Class and Objects
2. Decision Making using Control Statements and Loop Statements
3. Method Overloading and Method Overriding
4. Inheritance
5. Interface
6. Package
7. Multithread

8. Exception Handling
9. GUI using Swing
10. Database Connectivity using JDBC

Web References:

1. <http://docs.oracle.com/javase/tutorial/java/>
2. <http://www.java2s.com/Tutorial/Java/CatalogJava.htm>
3. <http://www.javatpoint.com/java-swing>
4. <http://way2java.com/java-versions-2/jdk-1-8-features/>
5. <https://www.w3schools.com/java/>
6. <https://www.tutorialspoint.com/java/>

Pedagogy:

Power Point Presentations, Demo by e-Contents tutorials

Course Designer:

Ms.N.Girubagari

Semester II	Internal Marks:40		External Marks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UCS2CC3P	DATA VISUALIZATION (P)	CORE	3	3

Course Objective

- To perform basic calculations and formatting on Data
- To expose the visual representation methods and techniques that increase the understanding of complex data
- To gain knowledge in good design practices for visualization of data

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate the use of basic Functions, Methods and Formatting	K2
CO2	Identify the different Models for data analysis	K3
CO3	Analyze the data using Graph Function	K4
CO4	Construct the data analysis report with proper validation	K5
CO5	Build Dashboard for data visualization	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	2	3	2	3	1	3	3
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	2	3	2	3	1	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight(Low) Correlation

“3”–Substantial (High) Correlation

“2”–Moderate(Medium)Correlation

“-”indicates there is no Correlation.

Exercises:

1. Using Microsoft Excel
 - a. Creation and Formatting
 - b. Functions and Formulas
 - c. Graphs
 - d. Lookup and Reference Functions
 - e. Data Validation
 - f. Pivot table
 - g. Data analysis report generation
 - h. Working with multiple worksheets
2. Using Power BI
 - a. Basic Reports
 - b. Filtering Data
 - c. Charts
 - d. Data Analysis
 - e. Book marks
 - f. Dashboard Creation
3. Data visualization using Tableau

Web References:

1. https://www.tutorialspoint.com/excel_data_analysis/
2. <https://www.udemy.com/course/data-visualization-in-excel-for-business-professionals/>
3. <https://www.w3schools.com/googlesheets/>
4. <https://www.smartsheet.com/how-create-dashboard-excel>
5. <https://www.javatpoint.com/tableau>

Pedagogy:

Demo by e-Contents

Course Designer:

Ms.N.Agalya

FIRST ALLIED COURSE –III (AC)
OPERATIONS RESEARCH

(For B.Sc Computer Science, Computer Science with Cognitive Systems, BCA & B.Sc Information Technology)

(2022-2023 and Onwards)

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS2AC3/ 22UCG2AC3/ 22UCA2AC3/ 22UIT2AC3/	OPERATIONS RESEARCH	ALLIED	4	3

Course Objective

- **Understand** the various features of Operations research.
- **Analyze** the optimum solutions using Operations research.
- **Explore** the concepts of Operations research in real life problems.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the various techniques of Operations research.	K1
CO2	Illustrate the various notions in the respective streams.	K2
CO3	Identify the different terminologies of Operations research	K3
CO4	Analyze the solutions of mathematical problem using specific techniques.	K4
CO5	Simplify the optimum solutions of a mathematical problem.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	3	3	2	3
CO2	3	2	3	3	2	3	3	3	3	2
CO3	3	2	3	3	2	3	2	3	2	2
CO4	3	2	2	2	2	3	3	2	3	2
CO5	3	2	3	2	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Operations Research Introduction-Origin and Development of O.R.- Nature and Features of O.R.- Scientific Method in O.R.- Modelling in Operations Research - Advantage and Limitation of Models- General Solution Methods for O.R. Models- Methodology of Operations Research- Operations Research and Decision Making</p> <p>Linear Programming Problem- Mathematical Formulation Introduction-Linear programming Problem-Mathematical Formulation of the problem -Illustrations on Mathematical Formulation of LPPs.(simple problems only)</p> <p>Linear programming problem-graphical Solution and Extension Introduction- Graphical Solution Method- General Linear Programming Problem- Canonical and Standard Forms of LPP.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Linear Programming Problem-Simplex Method Introduction-Fundamental Properties of Solutions- The computational Procedure- The Simplex Algorithm-Use of Artificial Variables-Big M method.(simple problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Transportation problem Introduction-LP Formulation of the Transportation Problem- Existence of Solution in T.P-The Transportation Table-Loops in Transportation Table-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Economic interpretation of u_j's and v_j's - Degeneracy in Transportation Problem-Transportation Algorithm (MODI method), (simple problems only).</p> <p>Assignment Problem Introduction-Mathematical Formulation of the Problem- Solution Methods of Assignment Problem-Special Cases in Assignment Problems(simple problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Sequencing problem Introduction-Problem of Sequencing-Basic Terms Used in Sequencing- Processing n Jobs through Two Machines- Processing n Jobs through k Machines(problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	<p>Network Scheduling by PERT/CPM Introduction- Network: Basic Components- Logical Sequencing- Rules of Network Construction-Concurrent Activities - Critical Path Analysis - Probability Considerations in PERT.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

VI	Self-Study for Enrichment (Not included for End Semester Examination) Application of Operations Research. – Two-Phase method – The Travelling Salesman problem – Processing 2 Jobs through k Machines – Inventory Models(without shortage)	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
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Text Book

1. Kanti Swarup, P.K. Gupta, Manmohan.(2019). *Operations research, Sultan Chand Publications.*

Chapters and Sections

- UNIT-I Chapter 1: Sections 1:1 – 1:9
 Chapter 2: Sections 2:1 – 2:4
 Chapter 3: Sections 3:1 – 3:5
- UNIT II Chapter 4: Sections 4:1 – 4:4
- UNIT-III Chapter 10: Sections 10:1 – 10:3, 10:5, 10:6, 10:8 – 10:13
 Chapter 11: Sections 11:1 – 11:4
- UNIT-IV Chapter 12: Sections 12:1 – 12:5
- UNIT-V Chapter 25: Sections 25:1 – 25:7

Reference Books

1. Hamdy A.Taha (2017), *Operations Research An Introduction*, Pearson India Education services PVT Ltd.
2. Premkumar Gupta, Hira D.S.(2004), *Operations Research*, S.Chand & Company Ltd, New Delhi.
3. Chandrasekhara Rao.K,Shanti Lata Mishra(2008), *Operations Research*, Narosa Publishing House PVT Ltd, New Delhi.

Web References

- 1.<https://www.britannica.com/topic/operations-research>
- 2.<https://byjus.com/maths/linear-programming/>
- 3.<https://www.gatexplore.com/transportation-problem-study-notes/>
- 4.<https://youtu.be/rowWM-MijXU>
- 5.<https://youtu.be/TQvxWaQnrqI>
- 6.https://youtu.be/RTX-ik_8i-k
- 7.<https://youtu.be/s5KZw1EpBEo>

Pedagogy

Power point presentation, Group discussion, Seminar, Assignment.

Course Designers

- 1.Dr. V. Geetha
2. Dr. S. Sasikala

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH “A” GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE



M. SC COMPUTER SCIENCE

SYLLABUS

2022-2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

VISION

To create an ambience for a quality academic erudition which drives technologically adept, innovative and globally competent graduates with ethical values

MISSION

- To have a breath of knowledge across the subject areas of Computer Science
- To professionally enrich the students for successful career in Academic, Industry and Research
- To promote and inculcate ethics and code of professional practice among students

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc COMPUTER SCIENCE PROGRAMME

PO NO.	Programme Outcome On completion of M.Sc. Computer Science The students will be able to
PO 1	DOMAIN KNOWLEDGE Acquire the in-depth computing knowledge both conceptual and applied pertaining to the core discipline
PO 2	PROBLEM SOLVING Procure knowledge-based skills to satisfy the needs of society and the industry by providing hands on experience of various technologies in Computer Science
PO 3	INNOVATION AND CRITICAL THINKING Critically evaluate global issues, recognize the need and identify sustainable solutions through research capabilities towards Nation building initiatives
PO 4	LIFE LONG LEARNING Capable of upgrading and advancing knowledge through innovation and technology as evidenced by current developments
PO 5	LEADERSHIP AND TEAMWORK Work in collaborative environment through applications of scientific reasoning and communicate effectively to the stakeholders

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc COMPUTER SCIENCE PROGRAMME

PSO NO.	Programme Specific Outcomes Students of M.Sc Computer Science will be able to	PO s Addressed
PSO 1	Identify, formulate and develop solutions for computational challenges	PO 1 PO 2
PSO 2	Inculcate broad knowledge in core areas of Computer Science and emerging technologies in related domains	PO 1 PO 2
PSO 3	Integrate computing knowledge on crafting innovative solutions and to provide a gateway for research.	PO 2 PO 3 PO 4
PSO 4	Develop analytical and technical skills to enhance employment potential and entrepreneurship	PO 3 PO 4 PO 5
PSO 5	Imbibe professional and ethical skills to become a competent citizen for the betterment of society	PO 3 PO 4 PO 5



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Computer Science

M.Sc Computer Science

**LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS- LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)**

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC)	Mathematical Foundation for Computer Science	22PCS1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Web Technologies	22PCS1CC2	6	5	3	25	75	100
	Core Course –III (CC)	Machine Learning Techniques	22PCS1CC3	6	5	3	25	75	100
	Core Practical - I (CP)	Web Technologies (P)	22PCS1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	A. Advanced Computer Architecture	22PCS1DSE1A	6	3	3	25	75	100
		B. Advanced Database System	22PCS1DSE1B						
		C. Software Testing	22PCS1DSE1C						
Total				30	23	-	-	-	500
15 Days INTERNSHIP during Semester Holidays									
II	Core Course– IV (CC)	Data Mining and Warehousing	22PCS2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Design and Analysis of Algorithms	22PCS2CC5	6	5	3	25	75	100
	Core Choice Course– I (CCC)	A. Mobile Computing	22PCS2CCC1A	6	4	3	25	75	100
		B. Wireless Sensor Networks	22PCS2CCC1B						
		C. MANET	22PCS2CCC1C						
	Core Practical - II (CP)	Data Mining (P)	22PCS2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course-II (DSE)	A. Cryptography and Network Security	22PCS2DSE2A	6	3	3	25	75	100
		B. Blockchain and Cryptocurrencies	22PCS2DSE2B						
		C. Ethical Hacking	22PCS2DSE2C						
	Internship	Internship	22PCS2INT	-	2	-	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600

III	Core Course– VI (CC)	WAP & XML	22PCS3CC6	6	5	3	-	100	100
	Core Course – VII (CC)	Cloud Computing	22PCS3CC7	6	5	3	25	75	100
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100
		B. IoT	22PCS3CCC2B						
		C. Compiler Design	22PCS3CCC2C						
	Core Practical - III (CP)	Cloud Computing (P)	22PCS3CC3P	5	5	3	40	60	100
	Discipline Specific Elective Course-III (DSE)	A. Computer Science for Competitive Examinations	22PCS3DSE3A	5	3	2	-	100	
		B. IoT (P)	22PCS3DSE3BP						
		C. Smart Devices Programming (P)	22PCS3DSE3CP						3
	Generic Elective Course -I (GEC)	Data Analysis (P)	22PCS3GEC1P	3	2	3	40	60	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
Total				30	24	-	-	-	600
IV	Core Course–VIII (CC)	Big Data Analytics	22PCS4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Robotic Process Automation	22PCS4CCC3A	6	4	3	25	75	100
		B. Virtual and Augmented Reality	22PCS4CCC3B						
		C. Digital Image Processing	22PCS4CCC3C						
	Core Practical - IV (CP)	FOSS (P)	22PCS4CC4P	6	5	3	40	60	100
	Generic Elective Course-II (GEC)	Animation (P)	22PCS4GEC2P	3	2	3	40	60	100
	Project	Project Work	22PCS4PW	9	5	-	-	100	100
	Total				30	21			
Grand Total				120	92				2200

Courses & Credits for M.Sc Computer Science Programme

S. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course– (CC)	8	40	800
2.	Core Choice Course– (CCC)	3	12	300
3.	Core Practical - (CP)	4	20	400
4.	Discipline Specific Elective- (DSE)	3	9	300
5.	Generic Elective Course - (GEC)	2	4	200
6.	Project	1	5	100
7.	Internship	1	2	100
	Total	22	92	2200

The Internal and External marks for theory and practical courses are as follows:

Course	Internal Marks	External Marks
Theory	25	75
Practical	40	60
Project	-	100
Internship	25	75

For Theory courses:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e. 30 marks)
- c) The passing minimum not less than 50% in the aggregate.

For Practical courses:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e. 24 marks)
- c) The passing minimum not less than 50% in the aggregate.

For Project Work:

- a) The passing minimum not less than 50% out of 100 marks

For Internship:

- a) The passing minimum not less than 50% in the aggregate.

SEMESTER I

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1CC1	MATHEMATICAL FOUNDATION FOR COMPUTER SCIENCE	CORE	6	5

Course Objective

- **Explore** the basic concepts of Discrete Mathematics, Graph Theory,
- **Acquire** the knowledge of Fundamentals in Fuzzy set Theory and combinatorics.
- **Analyze** the method of logical reasoning to solve variety of problems.

Prerequisites

Basic Knowledge in Essential Mathematics, Numerical and Statistics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Define the various concepts in Discrete Mathematics and Fuzzy Set Theory.	K1
CO 2	Understand the different terminologies of Discrete Mathematics and Fuzzy set theory.	K2
CO 3	Analyze the problems in different aspects and give solutions in their respective streams.	K3
CO 4	Examine some methodologies for the related area in an effective manner.	K4
CO 5	Apply the notions to distinct problems and get solutions in a easy way.	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	2	2	3	2	2	3	2	2	2	3
CO 2	2	2	3	2	2	2	2	2	2	3
CO 3	3	2	3	2	2	3	2	2	3	3
CO 4	3	2	2	2	2	2	2	2	2	2
CO 5	2	2	2	3	3	2	3	3	2	2

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Mathematical Logic: Statements and notation– Connectives – Negation– Conjunction– Disjunction-Statement Formulas and Truth Tables – Conditional and Biconditional – Well-formed Formulas – Tautologies – Duality law – Tautological Implications – Theory of inference for the statement calculus–Validity using Truth Tables – Rules of inference – Consistency of Premises and indirect Method of Proof</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Ordering: Partial ordering – Partially Ordered Set: Representation and Associated Terminology. Lattices and Boolean Algebra: Lattices as Partially ordered sets – Definition and Example – Some Properties of Lattices – Boolean Algebra – Definition and examples – Subalgebra, Direct Product and Homomorphism – Fundamental principles of counting: Permutations – Combinations: The Binomial theorem – Combinations with Repetition– The Principle of Inclusion and Exclusion: The Principle of Inclusion and Exclusion</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>Algebraic Structures: Introduction – Algebraic Systems: Examples and General Properties: Definition and Examples – Some Simple Algebraic Systems and General Properties – Semigroups and Monoids : Definitions and Examples – Homomorphism of Semigroups and Monoids – Subsemigroups and Submonoids – Groups: Definitions and Examples – Subgroups and Homomorphisms – Cosets and Lagrange’s Theorem. Group Codes: The Communication Model and Basic Notions of Error Correction – Generation of Codes by Using Parity Checks – Error Recovery in Group Codes.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>Graph Theory: Definition of a Graph – Application of Graphs – Finite & Infinite graphs – Incidence and Degree – Isolated Vertex, Pendent Vertex and Null Graph. Paths and Circuits: Subgraphs–Walks, Paths and circuits–Connected Graphs, Disconnected Graphs and Components – Euler graphs – More on Euler graphs – Hamiltonian paths and Circuits. Trees and Fundamental Circuits: Trees – Some Properties of Trees – Pendant Vertices in a Tree</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	From Classical (Crisp) Sets to Fuzzy Sets: Fuzzy sets: Basic types – Fuzzy sets: Basic Concepts. Fuzzy Sets Versus Crisp Sets: Additional Properties of α - cuts Operations on Fuzzy Sets: Types of Operations– Fuzzy Intersections: t-Norms – Fuzzy Unions: t-Conorms (Proof not needed).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examinations) Equivalence of Formulas – Recurrence relations: First order linear Recurrence Relation – The Application of Residue Arithmetic to Computers: Introduction to Number Systems – Residue Arithmetic – Operations on Graphs, Spanning trees – Fuzzy Complements.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Tremblay, J.P. & Manohar, R. (1997). *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw- Hill Publishing Company Limited, New Delhi.
2. Ralph, P. Grimaldi. (2002). *Discrete and Combinatorial Mathematics*, Pearson Asia Education.
3. Narsingh Deo. (1997). *Graph Theory With Applications To Engineering & Computer Science*. Prentice Hall of India, New Delhi.
4. Klir, G. J. and Yuan . R , (2001) *Fuzzy Sets And Fuzzy Logic*, Prentice Hall of India, New Delhi.

UNIT-I	Chapter 1: Sections 1-1, 1-2(1-2.1 to 1-2.4, 1-2.6 to 1-2.8, 1-2.10, 1-2.11)[1], 1-4(1-4.1 to 1-4.3) [1]
UNIT-II	Chapter 2: Sections 2-3(2-3.8, 2-3.9) [1] Chapter 4: Sections 4-1(4-1.1, 4-1.2), 4-2(4-2.1, 4-2.2) [1] Chapter 1: Sections 1.2 to 1.4 [2] Chapter 8: Sections 8.1 [2]
UNIT-III	Chapter 3: Sections 3-1, 3-2, 3-5 (3-5.1, 3-5.2 & 3-5.3 Only), 3-7 [1]
UNIT- IV	Chapter 1: Sections 1.1 to 1.5 [3] Chapter 2: Sections 2.2, 2.4 to 2.6, 2.8, 2.9 [3] Chapter 3: 3.1 to 3.3 [3]
UNIT- V	Chapter 1: Sections 1.3, 1.4 [4] Chapter 2: Sections 2.1 [4] Chapter 3: Sections 3.1, 3.3, 3.4 [4]

Reference Books

1. Ganesh, G.J.M. (2006). *Introduction To Fuzzy Sets And Logic*, Prentice-Hall of India, New Delhi.
2. Arumugam, S. & Ramachandran, S. (2001). *Invitation To Graph Theory*, Scitech Publications India Pvt Limited, Chennai.
3. Seymour Lipschutz, Marc Laris Lipson. (1999) *Schuam's Outlines Discrete Mathematics*, Tata McGraw- Hill Publishing Co., Ltd., New Delhi

Web References

1. https://www.youtube.com/results?search_query=negation+of+the+statement
2. https://www.youtube.com/results?search_query=permutation
3. https://www.youtube.com/results?search_query=graph+theory+definitions+and+examples
4. https://www.youtube.com/results?search_query=trees+in+graph+theory
5. https://www.youtube.com/results?search_query=fuzzi+sets+

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.S.Saritha

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1CC2	WEB TECHNOLOGIES	CORE	6	5

Course Objective

- To create own web page and how to host own web site on internet
- To familiarize Server Side Programming with Java Servlets, JSP and to commence Client Side Scripting with Java Script
- To analyze the basics involved in publishing content on the World Wide Web

Prerequisites

Java, HTML and Scripting

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Recall, Understand and Analyze the fundamentals of web application and web services	K1, K2,K3
CO 2	Determine the essential elements and the attributes to design a web page	K3, K5,K6
CO 3	Identify and Apply appropriate Client Side and Server Side programming for creating interactive web design	K3,K5
CO 4	Examine and recommend a solution to complex problems using appropriate method, technologies and web services	K4, K5
CO 5	Create and deploy real time web applications in web servers	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	3	2	3	3	2	3	2
CO 2	3	3	2	3	2	3	3	2	3	2
CO 3	3	3	2	3	3	3	3	2	3	3
CO 4	3	3	2	3	3	3	3	2	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

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“2” – Moderate (Medium) Correlation
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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Web Essentials: Clients, Servers, and Communication: The Internet-Basic Internet Protocols –TCP/IP- UDP-DNS-Domain Names–The World Wide Web-HTTP Request Message-Response Message-Web Clients-Web Servers- Markup Languages: XHTML 1.0: An Introduction to HTML- History and Versions-Basic XHTML Syntax and Semantics- Some fundamental HTML Elements-Relative URLs-Lists-Tables-Frames-Forms.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Style Sheets: CSS -Introduction to Cascading Style Sheets-Features-Core Syntax-Style Sheets and HTML-Style Rule Cascading and Inheritance-Text Properties-CSS Box Model- Normal Flow Box Layout- Beyond the Normal Flow: properties for positioning, relative, float, absolute positioning.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Client- Side Programming: The JavaScript Language: History and Versions - Introduction - JavaScript in Perspective-Syntax -Variables and DataTypes-Statements-Operators-Literals-Functions-Objects-Arrays-Built-in Objects.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Server-Side Programming: Java Servlets: Architecture Overview-A Servlet-Generating Dynamic Content-Life Cycle-Parameter Data-Sessions-Cookies-URL Rewriting - Servlets and Concurrency. RMI Architecture - Working With RMI- Application Development With RMI.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Separating Programming and Presentation: JSP Technology- Introduction to JSP- Running JSP Applications: Web Applications and Parameters- Basic JSP – Support for the Model-View-Controller Paradigm – Web Services: Web Services Concepts- Writing a Java Web Service Client-Describing Web Services: WSDL-Representing Data Types: XML Schema.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Search Engine features: Real time applications for client and server side programming (JavaScript, RMI) – Platform supporting for web services.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Jeffrey C.Jackson.(2009). *Web Technologies-A Computer Science Perspective*. 1st Edition, Pearson Education.

Reference Books

1. Robert W.Sebesta.(2007). *Programming the World Wide Web*. 4th Edition, Pearson Education.
2. Harvey M.Deitel, Paul J.Deitel, Andrew B.Goldberg.(2006). *Internet & World Wide Web How To Program* . 3rd Edition, Pearson Education.
3. Marty Hall, Larry, Brown.(2001) .*Core Web Programming*. 2nd Edition, Volume I& II, Pearson Education.
4. Moseley(2007). *Developing Web Applications*. 1st Edition, Wiley.
5. Herbert Schildt. (2012). *The Complete Reference–JAVA*. 7thEdition, TMH.

Web References

1. www.w3schools.com
2. www.geeksforgeets.org/web-technology/
3. www.guide.freecodecamp.org
4. www.alphadevx.com

Pedagogy

Chalk and Talk, Group discussion, Seminar & Assignment.

Course Designer

Dr.K.Reka

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1CC3	MACHINE LEARNING TECHNIQUES	CORE	6	5

Course Objective

- To understand the need of machine learning to solve problems in real time applications
- To study the various learning algorithms in machine learning
- To be able to formulate new approaches in machine learning

Prerequisites

Basic Knowledge in Programming Languages (Python, R), Statistics, Linear Algebra and Calculus

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Recognize and Understand the rudiments of Machine Learning	K1, K2
CO 2	Examine and Infer the hypothesis, limitations of Machine Learning methods	K2, K4
CO 3	Identify, Analyze and Interpret various Learning algorithms	K3, K4, K5
CO 4	Apply and Evaluate the solutions of various Machine Learning techniques	K4, K5
CO 5	Assess, Distinguish and Determine the Machine Learning techniques for Real-world applications	K3, K4, K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	2	3	3	3	3	2
CO 2	3	3	3	3	2	3	3	3	3	3
CO 3	3	3	3	3	3	3	3	3	3	3
CO 4	3	3	3	3	3	3	3	3	3	3
CO 5	3	3	3	3	3	3	3	3	3	3

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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Let's Integrate with Machine Learning: General Introduction to Machine Learning – The Details of Machine Learning - The Practical Concepts of Machine Learning: Machine Learning, AI, the Brain and the Business of Intelligence – General Architecture of Machine Learning – Types of Machine Learning	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Concept Learning and the General-to-Specific Ordering: A Concept Learning Task– Concept Learning as Search – Version Spaces and Candidate-Elimination Algorithm - Inductive Bias – Decision Tree learning: Decision Tree Representation – The Basic Decision Tree Learning Algorithm – Issues in Decision Tree Learning	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Artificial Neural Networks: Neural Network Representation – Appropriate Problems for Neural Network Learning – Perceptrons – Multilayer Networks and the Back Propagation Algorithm – Genetic Algorithms: Genetic Algorithms –Hypothesis Space Search – Genetic Programming – Models of Evolution and Learning	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Bayesian Learning: Bayes Theorem – Bayes Theorem and Concept Learning –Bayes Optimal Classifier – Gibbs Algorithm – Naïve Bayes Classifier – Bayesian Belief Networks – The EM Algorithm – Computational Learning Theory: Sample Complexity for Finite Hypothesis Spaces - Sample Complexity for Infinite Hypothesis Spaces	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Instance-Based Learning: K- Nearest Neighbor Learning – Locally Weighted Regression – Radial Basis Functions–Case-Based Reasoning - Combining Inductive and Analytical Learning: The EBNN Algorithm – The FOCL Algorithm – Reinforcement Learning: Q Learning	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Machine Learning Models- Find-S: Finding a Maximally Specific Hypothesis- Advanced Topics in Artificial Neural Networks- The Mistake Bound Model of Learning- Industrial Applications of Machine Learning: Manufacturing Analytics – Healthcare Analytics.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Patanjali Kashyap(2017). *Machine Learning for Decision Makers*. 1st Edition. Apress. **(Unit I)**
2. Tom M. Mitchell(2018). *Machine Learning*. 1st Edition, McGraw-Hill Education (India) Private Limited **(Units II-V)**

Reference Books

1. Ethem Alpaydin (2010). *Introduction to Machine Learning*. Second Edition. The MIT Press.
2. Stephen Marsland (2014). *Machine Learning: An Algorithmic Perspective*. Second Edition. CRC Press.

Web References

1. <https://www.simplilearn.com/tutorials/machine-learning-tutorial>
2. <https://machinelearningmastery.com/start-here/>
3. <https://www.mygreatlearning.com/blog/machine-learning-tutorial/>

Pedagogy

Chalk and talk, Discussion, Quiz, Assignment & PPT

Course Designer

Ms S.Udhaya Priya

Semester: I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1CC1P	WEB TECHNOLOGIES (P)	CORE	6	5

Course Objective

- To provide fundamental concept of Internet, JavaScript, Servlet with a view to developing professional software development skills
- To implement JSP and Servlet concepts to create an interactive application
- To inculcate knowledge in developing application using RMI

Prerequisites

Java, HTML and Scripting

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	List and Illustrate the usage of HTML Tags	K1,K2
CO2	Demonstrate and make use of Java Script in web applications	K2, K3
CO3	Apply and compare JSP tags to create a web page	K3, K4
CO4	Examine and Evaluate the client/server application using RMI	K4, K5
CO5	Interpret and Develop web application using Servlet	K5,K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	2	3	2	3	3	3	3	2
CO 2	3	3	2	3	2	3	2	2	3	2
CO 3	3	3	2	3	3	3	3	3	3	3
CO 4	3	3	3	3	3	3	3	3	3	2
CO 5	3	3	3	3	3	3	3	3	3	3

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Exercises

1. Develop your college web portal using HTML.
2. To develop a Style Sheet using Link, Table, Box, List and Positioning.
3. Write a Java Script code block, which checks the contents entered in a form’s text element. If the text entered is in the lower case, convert to uppercase.

4. Write a Java Script code block, which validates a username and password.
 - a) If either the name or password field is not entered, display an error message.
 - b) If the fields are entered do not match with default values display an error message.
 - c) If the fields entered match, display the welcome message.
5. Write a program in Java to implement a Client/Server application using RMI.
6. Write a program in Java to create a Cookie and set the expiry time of the same.
7. Write a program in Java to create Servlet to count the number of visitors to a web page.
8. Write a program in Java to create a form and validate a password using Servlet.
9. Create an application using basic JSP tag

Web References

1. <https://www.w3.org/TR/html401/present/styles.html>
2. www.studytonight.com/java/rmi-in-java.php
3. <https://www.tutorialspoint.com/servlets/servlets-session-tracking.htm>
4. <https://www.edureka.co/blog/servlet-and-jsp-tutorial/>

Pedagogy

Demonstration

Course Designer

Ms.S.Udhaya Priya

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1DSE1A	ADVANCED COMPUTER ARCHITECTURE	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To understand the micro-architectural design of processors
- To learn about the various techniques used to obtain performance improvement and power savings in current processors
- To gain knowledge in distributed and Parallel Computing Architecture

Prerequisites

Microprocessor

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Remember and Understand the computer architecture	K1, K2
CO 2	Interpret and Experiment with different pipelined processor	K2, K3, K5
CO 3	Organize and Analyze the architectural features of advanced processors	K3, K4
CO 4	Examine and Evaluate the cache and memory related issues in multiprocessors	K4, K5
CO 5	Assess the historical and current developments in computer architecture and adopt to the needs	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	2	3	2	3	2	3	2	2	3
CO 3	2	3	2	3	2	3	3	3	3	3
CO 4	3	3	3	2	3	3	3	3	2	2
CO 5	2	3	3	3	2	2	3	3	3	3

“1” – Slight (Low) Correlation
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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Quantitative Design and Analysis: Introduction-classes of computers- defining computer architecture-Trends in Technology, Power, Energy and Cost, Dependability	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	ILP Concepts and challenges: Compiler Techniques for Exposing ILP – Dynamic Branch Prediction-Dynamic Scheduling-Multiple Instruction Issue-Hardware based Speculation-Static Scheduling-Multi threading	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Vector Architecture: SIMD Extensions-Graphics Processing Units-Loop Level Parallelism	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	TLP: Introduction-Centralized Shared Memory-Architectures-Performance of Symmetric shared memory multiprocessor-Synchronization-Models of Memory Consistency	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Programming Models and Workloads for Warehouse: Scale Computers- Computer Architecture of Warehouse Scale Computers - Physical Infrastructure and Costs of Warehouse Scale Computers - Cloud Computing: The Return of Utility Computing	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Historical Perspectives Quantitative Design and Analysis: Limitations of Instruction-Level Parallelism and Its Exploitation-Fallacies and pitfalls of Data-Level Parallelism in Vector-Cross Cutting Issues in Thread-Level Parallelism-Using Energy Efficiency inside the server.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book:

1. John L Hennessey, David A Patterson (2012). *Computer Architecture A Quantitative Approach*. Fifth Edition, Morgan Kaufmann Elsevier.

Reference Books

1. Kai Hwang, Faye Brigg(2000). *Computer Architecture And Parallel Processing*. International Edition, McGraw-Hill.
2. Sima D, Fountain T, Kacsuk P(2000). *Advanced Computer Architectures: A Design Space Approach*. Addison Wesley.

Web References

1. www.cs.iit.edu.in/
2. <https://passlab.github.io/CSE565/note>

Pedagogy

Chalk and talk & Seminar

Course Designer

Ms.R.Rita Jenifer

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PCS1DSE1B	ADVANCED DATABASE SYSTEM	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To inculcate knowledge in Transaction Management with ACID properties
- To learn about advanced concepts of Database Management System
- To gain Knowledge in Information retrieval using XML and Internet Databases

Prerequisites

RDBMS

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Remember and Understand the concepts of databases	K1, K2
CO 2	Demonstrate and make use of different kinds of databases	K2, K3
CO 3	Identify and analyze databases for real life applications	K3, K4
CO 4	Compare and evaluate the performance of databases based on its transaction and concurrency control feature	K4, K5
CO 5	Interpret and develop parallel, distributed, object oriented and advanced databases for handling real time data	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	3	3	3	3	3	3
CO 2	3	2	3	2	3	3	3	2	2	3
CO 3	2	3	2	3	2	3	3	3	3	3
CO 4	3	3	3	2	3	2	3	3	2	2
CO 5	2	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation
“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Parallel Databases: I/O Parallelism-Inter Query Parallelism –Intra Query Parallelism - Interoperation Parallelism -Query Optimization-Design of Parallel Systems-Parallelism on Multicore Processors	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Distributed Databases: Homogeneous and Heterogeneous Databases-Distributed Data Storage-Distributed Transactions-Commit Protocol-Concurrency Control in Distributed Databases-Distributes Query Processing- Heterogeneous Distributed Databases-Cloud Based Databases-Directory Systems	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Object Based Databases: Complex Data Types-Structured types and Inheritance in SQL– Table Inheritance-Object Identity and Reference Types in SQL –Implementing O-R features – Object Relational Mapping-Object- Oriented versus Object-Relational.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Transactions Management: Transaction Concepts—A Simple Transaction Model-Transaction Atomicity and Durability–Transaction Isolation- Transaction Isolation and Atomicity– Concurrency Control: Lock based Protocols-Deadlock Handling-Multiple Granularity-Timestamp-Based Protocols-Validation- Based Protocols.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	XML: Extensible Markup Language-Structured Semi Structured and Unstructured Data-XML Hierarchical (Tree) Data Model-XML Documents, DTD, XML Schema-Storing and Extracting XML documents from Databases-XML Languages.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Query Optimization techniques supporting platforms (SQL, MYSQL, Oracle)-Most popular Cloud Databases and their Features (DynamoDB, NO SQL)- Popular Object Databases and their Features(Mongo DB)- Transaction and Concurrency control used in Real time Systems- Advanced Technologies in Database Systems: Data mining, Information Retrieval(Text Data Base).	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Abraham Silberschatz., Henry F. Korth. S. Sudharshan (2013). *Database System Concepts*. 6th Edition, Tata McGraw Hill. **(Unit I-IV)**
2. Ramez Elmasri, Shamkant. B.Navathe (2015). *Fundamentals of Database Systems*. 6th Edition, Pearson Education. **(Unit V)**

Reference Books

- 1.Thomas Connolly, Carolyn Begg (2015). *Database Systems, A Practical Approach to Design, Implementation and Management*. 6th Edition, Pearson Education.
- 2.Raghu Ramakrishnan, Johannes Gehrke (2007).*Database Management System*.3rd Edition, McGraw Hill Higher Education.

Web References

1. <https://www.db-book.com/db6/>
2. <https://www.worldcat.org>

Pedagogy

Chalk and talk, Lecture, Discussion, Quiz, Demonstration and PPT

Course Designer

Ms.G.Sujatha

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PCS1DSE1C	SOFTWARE TESTING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To understand the quality aspects of a software
- Able to identify and prevent the defects of the software
- Provides exposure on principles in testing

Prerequisites

Software Engineering

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Remember and Understand testing approaches for the software	K1, K2
CO 2	Compare and Identify the testing strategies to be used for efficient software construction	K2, K3, K4
CO 3	Identify and Inspect the quality factors and best practices in various testing	K3, K4
CO 4	Examine and explain the different phases of testing for the software development	K4, K5
CO 5	Analyze and Interpret the tools for software testing	K4, K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	2	2	2	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Software Development Life Cycle Models: Phases of Software Project- Quality, Quality Assurance and Quality control – Testing, Verification & Validation – Process Model – Life Cycle Models - White Box Testing – Static Testing – Structural Testing – Black Box Testing	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Integration Testing: Integration Testing as a Type of Testing – Integration Testing as a Phase of Testing – Scenario testing – Defect Bash - System and Acceptance Testing: Overview –System Testing – Functional Vs Non Functional Testing — Acceptance Testing –Summary of Testing Phases	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Factors governing Performance Testing: Methodology for Performance Testing –Performance Testing – Process for Performance Testing - Regression Testing - Best Practices in Regression Testing	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Test Phases: Enabling Testing – Locale Testing – Validation – Language Testing – Localization Testing – Tools– Ad hoc Testing: Overview – Buddy Testing – Pair Testing – Exploratory Testing – Iterative Testing – Usability and Accessibility Testing: - Usability Testing – Quality Factors – Aesthetics Testing	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Test Planning, Management, Execution and Reporting: Test Planning -Test Management – Test Process – Test Reporting – Best Practices - Software Test Automation: Terms used in Automation – Skills Needed for Automation – Automate, Scope of Automation– Process model for Automation – Selecting a Test tool – Automation for Extreme Programming Model – Challenges in Automation	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Tools for White Box and Black Box Testing- Specialized Testing types in Functional and Non-Functional Testing-Tools for Regression and performance Testing- Agile and Extreme testing in Real time with example-Different types of Automated tools for Software testing	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

- 1.Srinivasan Desikan, Gopaldaswamy Ramesh (2011). *Software Testing – Principles & Practices*. 1st Edition,Pearson Education.

Reference Books

- 1.Ron Patton (2006). *Software Testing*. 2nd Edition, Pearson Education.
- 2.William E. Perry (2006). *Effective Methods for Software Testing*.3rd Edition,Wiley India.
- 3.Renu Rajani, Pradeep Oak (2004). *Software Testing – Effective Methods, Tools and Techniques*. 2nd Edition.TMH Publishing Company Limited.

Web References

1. <https://www.gcreddy.com/2021/05/software-testing-syllabus.html>
2. https://onlinecourses.nptel.ac.in/noc19_cs71/preview
3. <https://www.softwaretestinghelp.com/online-software-testing-course-syllabus/>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz and Seminar

Course Designer

Dr.D.Radhika

SEMESTER II

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CC4	DATA MINING AND WAREHOUSING	CORE	6	5

Course Objective

- Able to understand the data sets and data preprocessing
- Demonstrate the working of algorithms for data mining tasks such as association rule mining, classification, clustering and regression
- Exercise the data mining techniques with varied input values for different parameters
- Ability to apply mining techniques for realistic data
- To prepare the students for building career in data warehousing and data mining areas

Prerequisites

Basic knowledge in Probability, Programming Languages and Database concepts

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Recognize the basic concepts and functionality of data mining and warehousing.	K1, K2
CO 2	Identify and Choose appropriate data mining techniques	K2, K3
CO 3	Apply and Analyse the suitable solution to the problem	K3, K4
CO 4	Build and Justify the results produced by data mining	K3, K5
CO 5	Categorize and evaluate skills in selecting the appropriate data mining algorithm for solving practical problems	K4, K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	2	2	3	3	3	2	2
CO2	3	3	3	2	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

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“3”-Substantial (High) Correlation

“2”-Moderate (Medium) Correlation
“-”-indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Data mining – Kinds of data to be mined– Kinds of patterns to be mined– Kinds of Applications to be targeted-Major Issues in Data mining – Data mining Trends and Research Frontiers: Other Methodologies – Data mining Applications –Data mining Trends.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Data Pre-Processing: Data Cleaning–Data Integration-Data Reduction: Overview of Data Reduction Strategies – Wavelet Transforms – Principle Component Analysis – Attribute Subset Selection –Data Transformation and Data Discretization: Data Transformation Strategies Overview – Data Transformation by Normalization. Mining Frequent Patterns, Associations and Correlations: Basic concepts – Frequent Itemset Mining Methods- Pattern Evaluation Methods.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Advanced Pattern Mining: Pattern Mining: A Road Map – Pattern Mining in Multilevel, Multidimensional Space-Constraint-Based Frequent Pattern Mining. Data Warehousing: Basic Concepts – Data Warehouse Modeling: Data cube and OLAP – Data Warehouse Design and usage.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Classification: Basic concepts- Decision Tree Induction - Bayes Classification Methods – Rule Based Classification – Model Evaluation and Selection-Techniques to improve Classification Accuracy - Classification using Frequent Patterns.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Cluster analysis: Basic concepts and methods – Cluster analysis – Partitioning methods - Hierarchical Methods – Density Based Methods-Grid Based Methods-Evaluation of Clustering.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Classification: Advanced Methods: Classification by Back Propagation – Support Vector Machines –K - Nearest-Neighbor Classifiers – Genetic algorithms. Advanced Cluster Analysis: Clustering High Dimensional data. Outlier Detection: Outlier and Outlier Analysis.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Book

1. Jiawei Han, Micheline Kamber, JianPei. (2019).*Data Mining: Concepts and Techniques*. Third Edition, Morgan Kaufman Publishers.

Reference Books

1. Margaret H. Dunham. (2006).*Data Mining Introductory and Advanced Topics*. Pearson Education.
2. C. S. R. Prabhu (2010). *Data Warehousing: Concepts, Techniques, Products and Applications*. Second Edition, PHI Learning Private Ltd.
3. K.P.Soman, Shyam Diwakar, V.Ajay. (2010).*Insight into Data Mining Theory and Practice*. First Edition, PHI Learning Private Ltd.

Web References

1. www.tutorialride.com/data-mining/data-mining-tutorial.htm
2. https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm
3. www.guru99.com/datawarehouse-architecture.htm
4. www.tutorialpoint.com/dwh/dwh_data_warehousing.htm

Pedagogy

Chalk and Talk, Group discussion, Seminar& Assignment.

Course Designer

Ms. S.Udhaya Priya

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CC5	DESIGN AND ANALYSIS OF ALGORITHMS	CORE	6	5

Course Objective

- To learn the techniques for effective problem solving in computing
- Apply important algorithmic design paradigms and methods of analysis
- Analyze the asymptotic performance of algorithms to show the efficiency of the algorithm
- Write rigorous correctness proofs for algorithms
- Demonstrate a familiarity with major algorithms and data structures

Prerequisites

Basic Knowledge in Programming and Data Structures

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Understand & Identify the suitable data structures and Design algorithms for various computing problems.	K1, K2, K3
CO2	Explain the algorithm design technique & demonstrate the complexity of algorithms.	K2, K3, K4
CO3	Analyze the different algorithm design techniques for a given problem and time & space complexity of the algorithm	K3, K4, K5
CO4	Assess and Compare the efficiency of the algorithm	K4, K5
CO5	Determine and Recommend the suitable algorithmic design techniques for a given problem	K3, K4, K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	2	3	3	3	3	2
CO2	3	3	3	3	2	3	3	3	3	2
CO3	3	3	3	2	2	3	3	3	3	2
CO4	3	3	2	2	2	2	2	2	2	2
CO5	3	3	2	2	2	2	2	2	2	2

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“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-” Indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Notion of an Algorithm –Properties of an algorithm-Techniques to write an algorithm-Fundamentals of the analysis of algorithmic efficiency-Problem types-Analysis framework-Space & time complexity- measuring input size and running time-Asymptotic notation and its properties-Big Oh notation, Omega notation and Theta notation –Recurrence equation-solving best case-worst case and average case - Empirical Analysis-Mathematical Analysis for Recursive and non Recursive algorithms.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Elementary Data Structures: Stacks and Queues – Trees – Priority Queues – Heap sort- Graphs-Analysis. Divide and Conquer: The General Method –Linear search- Binary search-Merge Sort – Quick Sort-performance measurement–Analysis.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	The Greedy Method: General Method - Knapsack Problem – Job Sequencing With Deadlines - Minimum Cost Spanning Trees - Optimal Storage On Tapes – Single Source Shortest Paths-Analysis. Dynamic Programming: The General Method – Multistage Graphs – All-Pairs Shortest Paths – Single-Source Shortest Paths - Reliability Design-The Traveling Sales Person Problem- Analysis.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Basic Traversal and Search Techniques: Techniques for Binary Trees – Techniques for Graphs –Connected Components and Spanning Trees– DFS-Analysis. Backtracking: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring – Knapsack Problem.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Branch and Bound: The Method –Least cost search-Control abstraction for least cost search-Bounding-Least cost branch and bound- NP-HARD and NP-COMPLETE PROBLEMS: Basic concepts-NP-HARD Graph Problems	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Dictionaries – Sets and Disjoint Set, Union– Graphs-Container Loading -Tree Vertex Splitting –Optimal merge pattern-Optimal Binary Search Trees -String Editing - 0/1 Knapsack- Flow Shop Scheduling- Bi-Connected Components- Hamiltonian Cycles – 0/1 Knapsack Problem-TSP	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mrs.Anuradha, A.Putnam Baker.(2019). *Design & Analysis of algorithms*. First Edition, Technical publications.
2. Ellis Horowitz, Sartaj Sahni and Sanguthevar, Rajasekaran. (2015). *Fundamentals of Computer Algorithms*. Second Edition, Universities Press.

Reference Books

1. V.Aho, Hopcroft, Ullman,(2009). *Data Structures and Algorithms*. 4th Edition, Pearson Education.
2. Anany Levitin(2012). *Introduction to the Design and Analysis of Algorithms*. Third Edition, Pearson Education
3. Gajendra Sharmah (2015).*Design & Analysis of Algorithms*. 4thedition,Khanna Publishers.

Web References

1. <http://nptel.ac.in/courses/106101059/>
2. <http://nptel.ac.in/courses/106101060/>
3. <http://www.personal.kent.edu/~rmuhamma/Algorithms/algorithm.html>
4. <http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-006-introduction-toalgorithms-fall-2011/lecture-videos/>
5. <http://cs.uef.fi/pages/franti/asa/notes.html>

Pedagogy

Chalk and Talk, Seminar, e-Content

Course Designer

Ms.K.Sangeetha

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CCC1A	MOBILE COMPUTING	CORE CHOICE	6	4

Course Objective

- To understand Wireless networks GSM, UMTS and WAP Architecture
- To gain basic knowledge about Android Application Development
- To create real time application using Content Providers

Prerequisites

Java, Computer Fundamentals and Networking

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Define and Outline the Mobile Computing frameworks	K1, K2
CO 2	Demonstrate the network concepts and Identify Routing protocols	K2, K3
CO 3	Identify and Analyze the basics of Android Programming	K3, K4
CO 4	Examine and Assess the Interfaces for the Android platform	K4, K5
CO 5	Explain and Build the key Android programming concepts	K5, K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1	3	3	3	3	2	3	3	3	2	3
CO 2	3	3	3	3	3	3	3	2	3	3
CO 3	3	3	3	3	3	3	3	3	2	3
CO 4	3	3	3	2	3	3	2	3	3	3
CO 5	3	3	2	2	3	3	3	2	3	3

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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Applications- Simplified Reference Model – Wireless Transmission: Signal Propagation-Path Loss of Radio Signals-Multipath Propagation-Multiplexing – Modulation- Cellular Systems- Telecommunication Systems: GSM – System Architecture- Handover – Security. Satellite Systems: Applications– Basics.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Wireless LAN: Advantages- Disadvantages- Design Goals- IEEE 802.11 – System Architecture-MAC Frames – MAC Management –Synchronization - Power Management – Roaming -Bluetooth - Architecture. Mobile Network Layer: Mobile IP- Goals –Entities and Terminology–IP Packet Delivery –Agent Advertisement and Discovery-Registration – Adhoc Networks – Routing - Routing Strategies-Destination Sequence Distance Vector – Dynamic Source Routing- Hierarchical Algorithms - Alternative Metrics.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Getting started with Android Programming: Introduction to Android – Obtaining the Required Tools-Creating an Android Application-Anatomy of an Android Application. Activities, Fragments, and Intents: Understanding Activities-Appling styles and Themes to an activity-Hiding the activity title-Displaying a dialog window-Displaying a progress dialog-Linking Activities Using Intents –Resolving Intent Filter collision-Returning Intents from an Intent-Fragments.	21	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Getting to know the Android User Interface: Understanding the Components of a Screen-Adapting to Display Orientation - Managing Changes to Screen Orientation - Designing user interface with views : Using Basic Views - Using Picker Views-Using List Views to Display Long Lists.	21	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Displaying Pictures and Menus with Views: Using Image views to display Pictures-Some additional views. Content Providers: Sharing Data in Android- Messaging: SMS Messaging-Sending SMS messages programmatically- Getting feedback after sending a message-Receiving SMS message- Sending E-mail– Location Based Services: Displaying Maps	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Data Persistence: Creating and using databases. Content Providers: Sharing data in Android-Using Content Provider. Developing Android services: Creating own services-Establishing communication between a service and an activity-Binding activity to services.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Jochen H.Schiller.(2014). *Mobile Communications*.2nd Edition, Addison Wesley Pearson Education.
2. Wei Meng Lee.(2012). *Beginning Android 4 Application Development*.1st Edition, Wiley India Pvt Ltd.

Reference Books

1. RajKamal.(2012),*Mobile Computing*,2nd Edition, Oxford University Press.
2. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal(2010).*Mobile Computing*. 2nd Edition, Tata McgrawHill Publishing Company Limited.

Web References

1. https://www.tutorialspoint.com/gsm/gsm_architecture.html
2. <https://www.geeksforgeeks.org/advantages-and-disadvantages-of-wlan>
3. <http://developer.android.com/guide/>
4. <http://developer.android.com/reference/packages.html>

Pedagogy

Chalk and Talk, Lecture, Group Discussion, e-Contents-Power point, Demonstration

Course Designer

Ms.K.Pradeepa

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CCC1B	WIRELESS SENSOR NETWORKS	CORE CHOICE	6	4

Course Objective

- To get a thorough knowledge about sensors and its architecture
- To learn the characteristics of wireless transmission
- To understand the working of MAC and Routing Protocols for sensor networks
- To gain knowledge in Transport layer, QoS and Security for sensor networks

Prerequisites

Basic knowledge in Data Communication Networks

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	List and Summarize the applications, challenges of wireless sensor networks	K1, K2
CO 2	Interpret and Make use of the architecture for the wireless networks	K2, K3
CO 3	Apply and Correlate the concepts in sensor networking	K3, K4
CO 4	Categorize and compare the different routing protocols	K4, K5
CO 5	Evaluate and Conclude the QoS in wireless networks	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	2	3	3	3	2	3
CO2	3	3	3	3	3	3	3	2	3	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	2	3	3	2	3	3	3
CO5	3	3	2	2	3	3	3	2	3	3

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Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Application Examples-Types of Applications -Challenges for Wireless Sensor Networks-Why are sensor networks different- Single-node architecture: Hardware components	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Single-Node Architecture: Energy Consumption of Sensor Nodes - Operating Systems and Execution Environments- Network Architecture: Sensor Network Scenarios-Design principles of WSNs.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	MAC Protocols: Fundamentals of MAC Protocol - Low Duty Cycle Protocols and Wakeup Concepts-Contention-based protocols -The IEEE 802.15.4 MAC protocol	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Routing protocols: Energy efficient unicast-Broadcast and multicast-Geographic routing. Data-centric and content based Networking: Data centric routing	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Transport Layer and Quality of Service: QoS-Transport protocols-Sensing models-Coverage measures-Reliable data transport-Single packet delivery-Congestion situations in sensor networks. Advanced application support: Security Fundamentals-Security considerations in wireless sensor networks -DoS Attacks	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Link Layer Protocols: Fundamentals-Tasks and requirements-Error control-Framing-Link Management	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. Holger Karl, Andreas Willig (2015). *Protocols and Architectures for Wireless Sensor Networks*. Student Edition, John Wiley & Sons.

Reference Books

1. Walteneus Dargie, Christian Poellabauer (2010). *Fundamentals of Wireless Sensor Networks Theory and Practice*. 1st Edition, John Wiley and Sons.
2. Xiang-Yang Li (2008). *Wireless Ad Hoc and Sensor Networks: Theory and Applications*. Illustrated Edition, Cambridge University Press.
3. Feng Zhao, Leonidas J.Guibas (2007). *Wireless Sensor Networks-An Information Processing*. 1st Edition, Elsevier.
4. Kazem Sohrawy, Daniel Minoli, Taieb Znati (2007). *Wireless Sensor Networks Technology, Protocols, and Applications*. Student Edition, John Wiley and sons.
5. Anna Hac (2003). *Wireless Sensor Network Designs*. 1st Edition, John Wiley and sons.

Web References

1. <https://www.intechopen.com/chapters/38793>
2. <https://www.geeksforgeeks.org/wireless-sensor-network-wsn/>
3. <https://nptel.ac.in/courses/106105160>
4. <http://www.tfb.edu.mk/amarkoski/WSN/Kniga-w02>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Quiz and Seminar

Course Designer

Dr.D.Radhika

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CCC1C	MANET	CORE CHOICE	6	4

Course Objective:

- To understand the principles of adhoc networks
- To get a knowledge of routing protocols and their performance
- To gain knowledge about battery management schemes
- To identify the issues and solutions of transport layer

Prerequisites

Computer Networks

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Recall and Understand the fundamentals of Mobile ad-hoc Networks.	K1, K2
CO 2	Identify and analyze the current features of MANET and WSN	K3, K4
CO 3	Determine and Classify the functions of various routing protocols and their implications	K3, K4
CO 4	Identify the issues of architecture and its protocol, and Design solutions to overcome the issues	K3, K5
CO 5	Discriminate the current trends in MANETs and WSNs from industry and research point of views.	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	3	1	3	3	2	3	1
CO2	2	3	3	2	2	3	3	2	3	2
CO3	2	3	3	2	2	3	2	2	2	2
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	3

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Fundamentals of Wireless Communication Technology – The Electromagnetic Spectrum – Radio Propagation Mechanisms – Characteristics of the Wireless Channel – IEEE 802 Networking Standard – Ad Hoc Networks: Introduction – Issues in Ad Hoc Wireless Networks – Ad Hoc Wireless Internet	14	CO1, CO2, CO4, CO5	K1, K2, K3, K4 K5
II	Routing Protocols for Ad Hoc Wireless Networks: Issues in Designing a Routing Protocol for Ad Hoc Wireless Networks – Classifications of Routing Protocols – Table-Driven Routing Protocols – On-Demand Routing Protocols - Hybrid Routing Protocols.	16	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Multicast Routing in Ad Hoc Wireless Networks: Issues in Designing a Multicast Routing Protocol – Classifications of Multicast Routing Protocols – Tree-Based Multicast Routing Protocols– Mesh-Based Multicast Routing Protocols– Energy-Efficient Multicasting.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Transport layer and Security Protocols for Ad Hoc Wireless Networks: Issues in Designing a Transport Layer Protocol for Ad Hoc Wireless Networks - Classification of Transport Layer Solutions – Network Security Requirements - Security in Ad Hoc Wireless Networks - Network Security Attacks - Secure Routing in Ad Hoc Wireless Networks – Quality of Service in Ad Hoc Wireless Networks: Network Layer Solutions	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Energy Management in Ad Hoc Wireless Networks: Battery Management Schemes-Transmission Power Management Schemes- Recent advances in Wireless Networks: Ultra-Wide-Band Radio Communication-Wireless Fidelity Systems.	20	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Wireless Sensor Networks: Sensor Network Architecture – Data Dissemination – Data Gathering – MAC Protocols for Sensor Networks – Location Discovery – Quality of Sensor Networks – Evolving Standards – Other Issues.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. C.Siva Ram Murthy, B.S.Manoj (2014). *Ad hoc Wireless Networks Architectures and protocols*. Pearson Education.

Reference Books

1. Stefano Basagni, Marco Conti, Silvia Giordano (2015). *Mobile Ad Hoc Networking: The Cutting Edge Directions*. 2nd Edition, Wiley India.
2. Mohamad Taha Sultan (2018). *Wireless Technologies in Mobile Ad-Hoc Networks*. Globe Edit.

Web References

1. <https://www.tutorialspoint.com/what-is-ad-hoc-network>
2. <https://www.javatpoint.com/mobile-adhoc-network>
3. <https://www.geeksforgeeks.org/introduction-of-mobile-ad-hoc-network-manet/>
4. <http://et.engr.iupui.edu/~dskim/manet/>

Pedagogy

Chalk and Talk, Group discussion, Seminar & Assignment

Course Designer

Ms.R.Sangeetha

Semester II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2CC2P	DATA MINING (P)	CORE	6	5

Course Objective

- Exposure on Solving of data science problems
- Analyze real life data sets for analysis and prediction.
- Able to explore data using Python and R

Prerequisites

Data Mining, Python and R languages

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Interpret on data insights to evaluate preprocessing techniques	K2
CO 2	Identify various algorithms used in information analysis of data mining Techniques	K3
CO 3	Evaluate the performance of various data mining algorithms	K5
CO 4	Visualize the results produced by data mining techniques	K6
CO 5	Formulate library functions of Python and R	K6

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	2	3
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	2	2

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

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Exercises

R

1. Built in functions
2. Operators
3. Looping statements
4. Reading and Writing Different Types of Datasets
5. Correlation and Covariance
6. Classification
7. Clustering
8. Visualizations

PYTHON

1. To compute central tendency and dispersion measures.
2. Implement python libraries.
3. Data Preprocessing
4. Implement Simple Linear and Multiple Linear Regressions.
5. Implement decision tree
6. Implement KNN
7. Implement K-means clustering
8. Implement Association Rule Mining

Web References

1. <https://www.springboard.com/blog/data-science/data-mining-python-tutorial/>
2. <https://dzone.com/refcardz/data-mining-discovering-and>
3. <https://www.rdatamining.com/>
4. <https://edisciplinas.usp.br/pluginfile.php/>

Pedagogy

Demonstration

Course Designer

Ms.S.Udhaya Priya

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2DSE2A	CRYPTOGRAPHY AND NETWORK SECURITY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To overview the principles of Network Security
- To inculcate the encryption standards and techniques
- To gain knowledge in establishing IP security

Prerequisites

Computer Networks

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Understand and state the Network security concepts	K1, K2
CO 2	Classify and apply network security principles	K2, K3
CO 3	Interpret and analyze network security protocols	K3, K4
CO 4	Examine and Defend network security threat	K4, K5
CO 5	Interpret with various network security applications	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	3	3	3	2	2	3	3	3	3	3
CO2	3	3	3	2	3	3	3	3	3	3
CO3	3	3	3	2	3	3	3	3	3	3
CO4	3	3	3	2	2	3	3	2	3	2
CO5	3	3	3	2	3	3	3	3	3	3

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Computer and Network Security concepts: Computer security concepts-The OSI Security architecture-Security Attacks – Security Services – Security Mechanisms-A model for Network Security. Classical Encryption Techniques: Symmetric Cipher Model-Substitution Techniques -Transposition Techniques –Steganography.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Block Ciphers and the Data Encryption Standard: Traditional Block Cipher Structure-The Data Encryption Standard-A DES Example -The Strength of DES-Block cipher design Principles- Public key cryptography and RSA: Principles of Public Key Cryptosystems – The RSA Algorithm.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Digital Signatures: Digital signatures- Mutual Trust: X.509 Certificates-Public Key Infrastructure. User Authentication: Remote User-Authentication Principles-Remote User-Authentication Using Symmetric Encryption-Kerberos-Remote User-Authentication Using Asymmetric Encryption.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Network Access Control and Cloud Security: Cloud Computing-Cloud Security Risks and Countermeasures. Transport–Level Security: Web Security Considerations-Transport layer Security- Wireless Network Security: Wireless Security – Mobile Device Security.	20	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Electronic Mail Security: Internet Mail Architecture-Email Formats- S/MIME-Pretty Good Privacy - IP Security: IP Security Overview –IP Security Policy-Encapsulating Security Payload- Combining Security Associations.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) System Security: Malicious Software: Viruses and Related Threats-Distributed Denial of Service Attacks. Intruders: Intrusion Detection – Password Management- Firewalls: Need for Firewalls-Types of Firewalls.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book

1. William Stallings.(2017).*Cryptography and Network Security-Principles and Practices*. 7th edition, Pearson Education, New Delhi.

Reference Books

1. Behrouz.A.Forouzan(2020).*Cryptography and Network Security*.5th Edition.Tata McGraw Hill, New Delhi.
2. Atul Kahate (2017).*Cryptography and NetworkSecurity*.3rd Edition, Tata McGraw Hill, New Delhi.
3. Charles P Fleegeer, Shari Lawrence P Fleegeer.(2011). *Security in Computing*. 4th Edition, Pearson Education, New Delhi.

Web References

1. <https://www.open.edu/openlearn/science-maths-technology/computing-and-ict/systems-computer/network-security/scs.carleton.ca/~paulv/5900wBooks.html>
2. [scs.carleton.ca/paulv/5900wBooks.html](https://www.carleton.ca/paulv/5900wBooks.html)
3. https://en.wikipedia.org/wiki/Network_security
4. <https://www.slideshare.net/HatemMahmoud/network-security-applications-4562405>
5. <https://www.intechopen.com/books/security-enhanced-applications-for-information-systems/cybersecurity-in-the-real-world>

Pedagogy

Chalk and Talk ,PPT, Discussion, Assignment

Course Designer

Ms.G.Sujatha

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22PCS2DSE2B	BLOCKCHAIN AND CRYPTOCURRENCIES	DISCIPLINE SPECIFIC ELECTIVE	6	3

- To assess blockchain applications in a structured manner
- To impart knowledge in block chain techniques and able to present the concepts clearly and structured
- To get familiarity with future currencies and to create own crypto token

Prerequisites

Basic knowledge in Cryptography, Data Structures, Distributed Systems and networking

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Understand the various technologies and its business use	K1
CO 2	Summarize the blockchain applications in a structured manner	K2
CO 3	Make use of the modern concepts of blockchain technology	K3
CO 4	Compare the modern currencies	K4
CO 5	Interpret the applications in real world scenario	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	2	3	2	2	2	2	2	2	2
CO2	2	2	3	2	2	2	2	2	2	2
CO3	3	2	3	2	2	2	2	2	3	2
CO4	3	2	2	2	2	3	2	2	2	2
CO5	2	2	2	3	3	3	2	2	2	2

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“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basic Concepts: Decentralized society - Distributed Database, Byzantine General problem - Fault tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete - P2P network - Private key - Public key - Cryptography - Hash Function - Digital Signature - ECDSA - Memory Hard Algorithm - Zero Knowledge Proof	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5
II	Blockchain: Introduction-Advantage over conventional distributed database - Network and protocols - Block chain network - Mining - Mechanism - Life Cycle of Block chain - Distributed consensus - Merkle Patricia Tree - Gas Limit - Transactions and Fee - Anonymity - Reward - Chain policy- Life of Block chain applications -Soft and Hard Fork - Private and Public blockchain.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5
III	Distributed Consensus: Nakamoto consensus - Proof of work - Proof of Stake - Proof of Burn - Difficulty level - Sybil Attack - Energy Utilization and alternate - Fabric model - SDKs - Components of Fabric Model - Architecture of Hyperledger fabric.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5
IV	Cryptocurrency: History - Distributed ledger - Bitcoin protocols - Mining strategy and rewards - Ethereum - construction - Truffle - DAO - dApps - Smart Contract - Boot strapping - GHOST Vulnerability - Attacks - Sidechain - Namecoin	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5
V	Applications: Payment Channels and State Channels - State Channels—Basic Concepts and Terminology - Simple Payment Channel Example-Routed Payment Channels- Bitcoin Transactions- Transaction Outputs and Inputs-Wallet Technology details	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Cryptocurrency Regulations: Stakeholders - Roots and Bitcoin - Legal Aspects - Crypto currency exchange - Black market and Global economy	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3 K4, K5

Text Books

1. Daniel Drescher(2017). *Blockchain Basics A Non-Technical Introduction in 25 steps*, 1st Edition, Apress.
2. Andreas M.Antonopoulos.(2019). *Mastering Bitcoin:Unlocking Digital Cryptocurrencies*. 2nd Edition, O'REILLY.

Reference Books

- 1.Paul Vigna and Michael J.Casey (2016). *The Age of Cryptocurrency*, 1st Edition, Picador St.Martin's Press.
- 2.Imran Bashir (2018). *Mastering Blockchain*. 1st Edition, Packt, Birmingham.
- 3.David Hooper, Kevin Solorio (2019). *Hands-On Smart Contract Development with Solidity and Ethereum: From Fundamentals to Deployment*, 1st Edition, O'REILLY.
- 4.Chris Dannen (2017).*Introducing Ethereum and Solidity*, 1st Edition, Apress.

Web References

1. <https://www.simplilearn.com/tutorials/blockchain-tutorial/blockchain-technology>
2. <https://sjce.ac.in/wp-content/uploads/2021/12/Block-Chain-notes.pdf>
3. [https://mrcet.com/downloads/digital notes.pdf](https://mrcet.com/downloads/digital%20notes.pdf)
4. <https://www.ibm.com/in-en/topics/what-is-blockchain>

Pedagogy

Chalk and Talk, Group discussion, Seminar & Assignment.

Course Designer

Dr.D. Radhika

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22PCS2DSE2C	ETHICAL HACKING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To understand and analyze information security threats and countermeasures
- To gain knowledge about security audit and testing
- To study the issues related to hacking and types of attacks

Prerequisites

Basic knowledge in Operating Systems, Networking and Programming Language

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Recall and Understand the vulnerabilities in hacking	K1, K2
CO 2	Analyze and apply testing for security	K3, K4
CO 3	Plan and Execute vulnerability assessment test for a network	K4, K5
CO 4	Assess the various kinds of standard attacks	K5
CO 5	Determine the target system vulnerability and make use of penetration test using standard hacking methods in an ethical manner	K5

Mapping of CO with PO and PSO

CO s	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PO 1	PO 2	PO 3	PO 4	PO 5
CO1	2	3	3	3	2	3	3	3	3	2
CO2	3	3	2	3	2	3	3	2	3	2
CO3	3	3	2	3	2	3	3	2	3	3
CO4	2	3	3	3	3	3	3	3	3	3
CO5	3	3	2	3	2	3	3	3	3	2

“1”–Slight (Low) Correlation
“3”–Substantial (High) Correlation

“2”–Moderate (Medium) Correlation
“-”indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction to Hacking: Important terminologies-Categories of Penetration Test-Writing Reports-Structure of a Penetration Testing Report-Vulnerability Assessment Summary-Risk Assessment-Methodology-Linux Basics: Major Linux Operating systems-File structure inside of Linux-Linux Scheduler(Cron Jobs)-Users inside of Linux-Common Applications of Linux-What is BackTrack-Changing the Default Screen Resolution-Some Unforgettable basics-Information Gathering Techniques-Active Information Gathering-Passive Information Gathering-Sources of Information Gathering-Copying Websites Locally-Yougetsignal.com-Intercepting a Response-WhatWeb-Netcraft-Some basic Parameters-TIP regarding Filetype-Xcode Exploit Scanner-Interacting with DNS Servers-Nslookup-DIG-Forward DNS Lookup with Fierce-Reverse DNS Lookup with fierce-What is DNS Cache Snooping-Automating DNS Cache Snooping Attacks-Problem with SNMP-Sniffing SNMP Passwords-SMTP Enumeration</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>Vulnerability Assessment: What are Vulnerability Scanners and how do they work?-Pros and Cons of a Vulnerability Scanner-Vulnerability Assessment with Nmap-Updating the database-Testing SCADA environments with Nmap-Nessus Vulnerability Scanner-Installing Nessus on BackTrack-Adding a User-creating a new policy-Safe Checks-Silent Dependencies-Port Range</p> <p>Network Sniffing: Introduction-Types of sniffing-Hubs versus Switches-Promiscuous versus Nonpromiscuous Mode-MITM Attacks-ARP Protocol Basics-How ARP works-ARP Attacks-Denial of Service attacks-Tools of the trade-Using ARP Spoof to perform MITM Attacks-Hijacking Session with MITM Attack-Hijacking the session-DNS Spoofing-DHCP Spoofing</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>Capturing Traffic: Using Wireshark-ARP Cache Poisoning-DNS Cache Poisoning-SSL Attacks-SSL Stripping-Password Attacks: Password management-Online password attacks-offline password attacks-Client Side Exploitation-Bypassing filters with Metasploit payloads-Client side attacks-Social Engineering: Social Engineering toolkit-Spear Phishing attacks-Web Attacks-Mass E-mail attacks-Multipronged Attacks.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

IV	<p>Bypassing Antivirus Applications: Trojans-How Antivirus application works-Microsoft Security essentials-Virustotal-Getting past an antivirus program-Post Exploitation: Meterpreter-Meterpreter scripts-Local privilege escalation-Lateral Movement-Pivoting Persistence-Web Application Testing: Using Burp proxy-SQL Injection-XPath Injection-Local file inclusion-Remote file inclusion-Command Execution-Cross Site Scripting-Cross site Request forgery-Web application Scanning with w3af.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Wireless Hacking: Introduction-Requirements-Introducing Aircracks-ng-Uncovering Hidden SSIDs-Turning on the Monitor mode-Monitoring Beacon frames on Wireshark-Monitoring with Airodump-ng-Speeding up the process-Placing your wireless adapter in Monitor mode-Determining the target with Airodump-ng-Cracking a WPA/WPA2 Wireless Network using Aircrack-ng-Capturing packets-Capturing the Four way handshake-Cracking WPA/WPA2-Reducing the delay-Web Hacking: Attacking the authentication-Brute Force and Dictionary Attacks-Types of Authentication-Brute Force attack-SSRF Attack-impact-Server hacking-Finding the local root exploit-basic syntax-Updating the password-Finding a WHMCS Server-Symlinking the Configuration file.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>Self Study for Enrichment (Not included for End Semester Examinations) Using Kali Linux: Linux Command Line-The Linux filesystem-User privileges-File permissions-Editing files-Data manipulation-Managing Installed Packages-Processes and Services-Managing Networking-Netcat: The Swiss Army knife of TCP/IP Connections</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Rafay Baloch(2014).*Ethical Hacking and Penetration Testing Guide*.1st Edition, CRC Press(for Unit I, II & V)
2. Georgia Weidman(2014).*Penetration testing: A hands-on introduction to hacking*.1st Edition, No Starch Press(for Unit III,IV & VI)

Reference Books

1. Stuttard,Dafydd and Marcus Pinto(2011). *The web application hacker's handbook:Finding and exploiting security flaws* . 2ndEdition, John Wiley & Sons.
2. Himanshu Sharma(2017).*Kali-linux Ethical Hacker's cook book: End-to-End penetration testing solution*.1st Edition, Packt Publishing.
3. Kimberly Graves(2010).*Certified Ethical Hacker Study Guide*.1st Edition, Wiley India Pvt Ltd.
4. Kevin Beaver.(2018). *Ethical Hacking for Dummies*. 6thEdition, Wiley

Web References

1. <https://www.elsevier.com/books/>
2. <https://www.elsevier.com/books/cyber-security-awareness-forlawyers>
3. <https://books.google.co.in/books>
4. <https://www.coursera.org/specializations/ethical-hacking>
5. <https://nptel.ac.in/courses>

Pedagogy

Chalk and Talk, Group discussion, Seminar & Assignment

Course Designer

Ms. S.Saranya

Semester II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS./WEEK	CREDITS
22PCS2INT	INTERNSHIP	INTERNSHIP	-	2

- At the end of Semester I, the students should undergo an internship in a reputed IT company or IT division of reputed company
- Minimum number of days for the internship is 15 days
- A project report and a certificate of attendance are to be submitted after completing the internship

EVALUATION PATTERN FOR INTERNSHIP

Internal Components	Marks	External Components	Marks
Institution Profile	5	Regularity	10
Presentation skill	10	Problem solving	10
Report Evaluation	10	Participation and Hands – on training	20
		Professional Attitude	15
		Report Writing	20
Total	25	Total	75

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited (III Cycle) with “A” Grade by NAAC

ISO 9001:2015 Certified

Annamalai Nagar, Trichy – 18.



DEPARTMENT OF COMPUTER APPLICATIONS

AUTONOMOUS SYLLABUS

BOARD OF STUDIES – 7

2022 – 2023



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with "A" Grade by NAAC
ISO 9001:2015 Certified
Annamalai Nagar, Trichy -18.

MINUTES OF THE MEETING-Board of Studies: 7
Department of Computer Applications

DATE: 14.10.2022

TIME : 10.30 AM

VENUE (Dual Mode): CA1 LAB and

Google Meet Link: <https://meet.google.com/vjt-sgiw-ryv>

The Agenda for the meeting was as follows:

1. ITEM NO.BOS/07/01

To consider and to approve the Programme Structure of BCA for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. ITEM NO.BOS/07/02

To consider and to approve the ratification of I Semester syllabus of BCA for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- I Semester syllabus for the Core Course I (CC) –“Programming in C” (22UCA1CC1)

3. ITEM NO.BOS/07/03

To consider and to approve the ratification of I Semester syllabus of B.Com CA for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- I Semester syllabus for the Allied Course I (AC) – “Fundamentals of Computer and Internet” (22UCC1AC1)

4. ITEM NO.BOS/07/04

To consider and to approve the II Semester syllabus of BCA for 2022-2023 batch onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- The Core Course II (CC) “Programming in Java” (22UCA2CC2)
- The Core Practical II (CP) “JAVA Programming” (22UCA2CC2P).
- The Core Course III (CC) “Data Structures” (22UCA2CC3).

5. ITEM NO.BOS/07/05

To consider and to approve the syllabus of B. Com CA students for 2022-2023 batch onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- The Core Course IV (CC) “Web Design” (22UCC2CC4)
- The Allied Practical - I (AP) “HTML Practical” (22UCC2AC1P)

6. ITEM NO.BOS/07/06

To consider and to approve the V and VI Semester syllabus of BCA for 2021-2022 batch onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- The Core Practical -V(CP), “Practical V- Web Applications”(21UCA5CC5P)
- The Major Based Elective –I, “Data Mining” (21UCA5MBE1C)
- The Major Based Elective – II
 - “Practical - MATLAB” (21UCA5MBE2AP)
 - “Practical-R Programming” (21UCA5MBE2CP)
- The Major Based Elective – III
 - “Web Technologies” (21UCA6MBE3B)
 - “Big Data Analytics” (21UCA6MBE3C)
- The Major Based Elective – IV
 - “Practical - Web Technology” (21UCA6MBE4BP)
 - “Practical - WEKA” (21UCA6MBE4CP)

7. ITEM NO.BOS/07/07

To thank the Board of Studies Members who contributed to prepare the syllabus.



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
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Annamalai Nagar, Trichy -18.

MINUTES OF THE MEETING-Board of Studies:7

Department of Computer Applications

DATE: 14.10.2022

TIME : 10.30 AM

VENUE (Dual Mode): CA1 LAB and

Google Meet Link: <https://meet.google.com/vjt-sgiw-ryv>

Members Present

- | | |
|---------------------------|---|
| 1. Dr. R. Merlin Packiam | Chairperson, Associate Professor & Head |
| 2. Dr. L. Ravi | Subject Expert, Other University |
| 3. Dr. G. Devika | Subject Expert, Other University |
| 4. Dr. V. S. Anita Sofia | Subject Expert, Bharathidasan University |
| 5. Ms. Valli Ramamurthy* | International Academic Expert, IBS University |
| 6. Ms. Raju Ambika Shree* | Alumna, Member |
| 7. Ms. Shyama Palanivel* | Placement Representative from Industry Corporate Sector |
| 8. Dr. H. Krishnaveni | Member |
| 9. Dr. R. Brendha | Member |
| 10. Ms. T. Julie Mary | Member |
| 11. Ms. A. Anandhavalli | Member |
| 12. Dr. Lakshna Arun | Member |
| 13. Ms. R. Sridevi | Member |
| 14. Dr. K. Akila | Member |
| 15. Ms. V. Yasodha | Member |
| 16. Ms. V. Infine Sinduja | Member |
| 17. Ms. M. Ellakkiya | Member |
| 18. Ms. A. Jabeen | Member |
| 19. Dr. N. Sivapriya | Member |
| 20. Ms. R. Sowbarnika | Student Representative |
| 21. Ms. V. Ragavi | Student Representative |

*Members who have attended the BoS meet through online.

Minutes of the Seventh BoS :

1. Resolution No.BOS/07/01

Considered and approved the Programme Structure of BCA for 2022-2023 batch onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. Resolution No.BOS/07/02

Ratified and approved the syllabus of I Semester for BCA students for 2022-2023 batch onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- The Academic Council Recommended Core Course I (CC) – “Programming in C” (22UCA1CC1) as common course for BCA,C.Sc & IT
- Unit VI has been included as a self-study portion

3. Resolution No.BOS/07/03

Ratified and approved the syllabus of I Semester for B.Com CA students for 2022-2023 batch onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- Allied Course I (AC) – “Fundamentals of Computer and Internet” (22UCC1AC1), Unit VI has been included as a self-study portion

4. Resolution No.BOS/07/04

Considered and approved II Semester syllabus of BCA for 2022-2023 batch onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 with the following changes

1. Revised of syllabus of Core Course “Programming in JAVA” (22UCA2CC2)

- Topics removed in

Unit I : Comparison of Java with C and C++, Command Line Arguments, Programming Styles, Tokens

Unit III : Wrapper Class

Unit IV : Throwing our own exceptions

- Topics included in

Unit VI: Portion for Self study

Graphics Programming using AWT, Swing and layout Manager:
Introduction – The Graphics Class- Lines and Rectangles- Circles and Ellipses-Drawing Arcs-Drawing Polygons.

2. Revised of syllabus of Core Practical - "JAVA Programming - Practical" (22UCA2CC2P)

- List of Practical exercises has been modified.

3. Considered and approved the syllabus for the Core Course III (CC) "Data Structures" (22UCA2CC3).

5. Resolution No.BOS/07/05

Considered and approved the II Semester syllabus of B. Com CA for 2022-2023 batch onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

- The Core Course IV (CC) "Web Design" (22UCC2CC4)
- The Allied Practical - I (AP) "HTML Practical" (22UCC2AC1P)

6. Resolution No.BOS/07/06


Considered and approved the V and VI Semester syllabus of BCA for 2021-2022 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18 with the following changes

- The Core Course - V (CP), "Practical V- Web Applications" (21UCA5CC5P)
- The Major Based Elective –I , "Data Mining" (21UCA5MBE1C)
- The Major Based Elective – II, "Practical-MATLAB" (21UCA5MBE2AP) and "Practical-R Programming" (21UCA5MBE2CP)
- The Major Based Elective – III, "Web Technologies" (21UCA6MBE3B) and "Big Data Analytics" (21UCA6MBE3C)
- The Major Based Elective –IV, "Practical- Web Technology" (21UCA6MBE4BP) and "Practical- WEKA" (21UCA6MBE4CP)

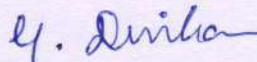
7. Resolution No.BOS/07/07

The Chairperson welcomed and introduced new members. The Department conducted more than five meetings with the faculty members of Computer Applications, to discuss the structure and contents of the syllabus framed by the Department. The Chairperson appreciated the efforts of the members of BoS, for their valuable contribution to prepare the syllabus.

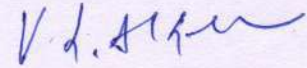
The Board of Studies meeting was resolved and concluded by recommending the UG Computer Applications - Programme Structure (I to VI semester) and syllabus of II Semester of BCA & B.Com CA for the batch 2022-2023 onwards and V & VI Semester syllabus of BCA for the 2021-2022 onwards to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.



Dr. L. Ravi
Associate Professor & Head
Department of Computer Science
Sacred Heart College
(Autonomous)
Tiruppattur-635 601.



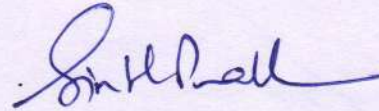
Dr. G. Devika
Assistant Professor & Head
Department of Computer
Science,
Mannar Thirumalai Naicker
College (Autonomous)
Madurai - 625 006.



Dr. V. S. Anita Sofia
Associate Professor
Department of Networking
and Mobile Application
PSG College of Arts &
Science (Autonomous)
Coimbatore- 641 014.



Dr. R. Merlin Packiam
Chairperson
Associate Professor & Head
Department of Computer Applications
Cauvery College for Women(Autonomous)
Trichy-620 018.



Dr. V. Sinthu Janita Prakash

DEAN OF SCIENCE
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

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DEPARTMENT OF COMPUTER APPLICATIONS



BACHELOR OF COMPUTER APPLICATIONS

SYLLABUS

2022 -2023 and Onwards

I & II SEMESTERS

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF COMPUTER APPLICATIONS

VISION

- ❖ To produce globally competent computer professionals by providing high quality education and also focus on developing the skills of technical competency.
- ❖ To make an incorporated framework that meets the higher instructive necessities of the community.
- ❖ To prepare the students for technical training with revolutionary vision so they can create employment opportunities for themselves as well as for others.

MISSION

- ❖ To produce a quality learning environment that helps students to enhance problem solving skills and practical knowledge.
- ❖ To provide technical education to the students through well-equipped labs.
- ❖ Giving personal attention to slow learners consequently, allowing them to cope up with other wards.
- ❖ To impart the professional and communication skills training to the students to get better placement.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES for B.Sc Computer Science,

B.Sc Computer Science with Cognitive Systems , BCA and

B.Sc Information Technology PROGRAMME

PO NO.	On completion of B. Sc Computer Science / B. Sc Computer Science with Cognitive Systems / BCA/ B. Sc Information Technology Programme, the students will be able to
PO 1	ACADEMIC SKILLS & SOCIAL RESPONSIBILITY Apply Computing, Mathematical and Scientific Knowledge in Various disciplines by understanding the concerns of the society.
PO 2	CRITICAL THINKING AND INNOVATIVE PROGRESS Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO 3	PERSONALITY DEVELOPMENT Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO 4	LIFELONG LEARNING Identify resources for professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO 5	CREATIVITY AND HOLISTIC APPROACH Create a scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PROGRAMME SPECIFIC OUTCOMES FOR BCA

PSO NO.	The students of Bachelor of Computer Applications will be able to	POs Addressed
PSO 1	Understand the concepts of logical and critical thinking with adequate practical skills.	PO1 PO2 PO4 PO5
PSO 2	Adopt necessary technical, scientific, managerial and financial knowledge to be employable or pursue higher education.	PO1 PO2 PO4
PSO 3	Apply neoteric technology in various domains and evaluate the method of implementing it.	PO1 PO2 PO4
PSO 4	Design and create innovative ideas that meet the requirements of an entrepreneur and software industry.	PO1 PO2 PO4 PO5
PSO 5	Explore the ethical values, sustainability and productivity.	PO3 PO4 PO5



**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF COMPUTER APPLICATIONS**

BCA

LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total		
							Hrs.	Marks				
								Int	Ext			
I	I	Language Course - I (LC)	Ikkala Ilakiyam – I	22ULT1	6	3	3	25	75	100		
			Hindi Literature & Grammar – I	22ULH1								
			History of Popular Tales, Literature and Sanskrit Story	22ULS1								
			Basic French – I	22ULF1								
	II	English Language Course - I (ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100		
	III	Core Course – I (CC)	Programming in C	22UCA1CC1	5	5	3	25	75	100		
				Core Practical - I (CP)	C Programming (P)	22UCA1CC1P	3	3	3	40	60	100
				First Allied Course - I (AC)	Essential Mathematics	22UCA1AC1	4	3	3	25	75	100
				First Allied Course - II (AC)	Numerical Analysis and Statistics	22UCA1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course - I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100		
Total					30	22				700		
II	I	Language Course – II (LC)	Idaikaala Ilakiyamum Pudhinamum	22ULT2	5	3	3	25	75	100		
			Hindi Literature & Grammar – II	22ULH2								
			Poetry, Textual Grammar and Alankara	22ULS2								
			Basic French–II	22ULF2								
	II	English Language Course - II (ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100		
	III	Core Course – II (CC)	Programming in Java	22UCA2CC2	5	5	3	25	75	100		
				Core Practical - II (CP)	JAVA Programming (P)	22UCA2CC2P	3	3	3	40	60	100
				Core Course -III (CC)	Data Structures	22UCA2CC3	3	3	3	25	75	100
				First Allied Course – III (AC)	Operations Research	22UCA2AC3	4	3	3	25	75	100
				Ability Enhancement Compulsory Course - II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
	IV	Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100		
	Extra Credit Course			SWAYAM	As per UGC Recommendation							
Total					30	23				800		

III	I	Language Course - III (LC)	Kaapiyamum Nadagamum	22ULT3	5	3	3	25	75	100	
			Hindi Literature & Grammar - III	22ULH3							
			Prose, Textual Grammar and Vakyaarachana	22ULS3							
			Intermediate French-I	22ULF3							
	II	English Language Course - III (ELC)	Learning Grammar Through Literature – I	22UE3	6	3	3	25	75	100	
	III	Core Course – IV (CC)	Database Management Systems	22UCA3CC4	6	6	3	25	75	100	
			Core Practical – III (CP)	Database Management Systems (P)	22UCA3CC3P	3	3	3	40	60	100
			Second Allied Course - I (AC)	Financial Accounting	22UCA3AC4	4	3	3	25	75	100
			Second Allied Course - II (AP)	Computer Applications in Business (P)	22UCA3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course - I (GEC)	Animation Tools I (P)	22UCA3GEC1P	2	2	3	40	60	100	
			Basic Tamil - I	22ULC3BT1				25	75		
			Special Tamil - I	22ULC3ST1							
		Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total				30	23					700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course - IV (LC)	Pandaiya Illakiyamum Urainadaiyum	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French – II	22ULF4							
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3	25	75	100	
	III	Core Course – V(CC)	Programming in Python	22UCA4CC5	6	6	3	25	75	100	
			Core Practical – IV (CP)	Python Programming (P)	22UCA4CC4P	4	4	3	40	60	100
			Second Allied Course- III (AC)	Business Communication	22UCA4AC6	4	3	3	25	75	100
			Internship	Internship	22UCA4INT	-	2	-	100	-	100
	IV	Generic Elective Course - II (GEC)	Animation Tools II (P)	22UCA4GEC2P	2	2	3	40	60	100	
			Basic Tamil - II	22ULC4BT2				25	75		
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course – I (SEC)	Documentation and Presentation Tools (P)	22UCA4SEC1P	2	2	3	40	60	100	
		Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total				30	25					800

V	III	Core Course – VI (CC)	Programming in PHP	22UCA5CC6	6	6	3	25	75	100
		Core Practical – V (CP)	PHP with MYSQL (P)	22UCA5CC5P	4	4	3	40	60	100
		Core Course – VII (CC)	Software Engineering	22UCA5CC7	6	6	3	25	75	100
		Core Course – VIII (CC)	Cloud Computing	22UCA5CC8	5	5	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. MATLAB (P)	22UCA5DSE1AP	5	4	3	40	60	100
	B. Web Development (P)		22UCA5DSE1BP							
	C. R Programming (P)		22UCA5DSE1CP							
	IV	Ability Enhancement Compulsory Course – IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Data Analytics using Excel (P)	22UCA5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM		As per UGC Recommendation					
Total					30	29				700
VI	III	Core Course – IX (CC)	Computer Networks	22UCA6CC9	6	6	3	25	75	100
		Core Course – X (CC)	Operating Systems	22UCA6CC10	5	5	3	25	75	100
		Core Practical– VI (CP)	Web Applications (P)	22UCA6CC6P	3	3	3	40	60	100
		Core Course – XI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. Internet of Things	22UCA6DSE2A	5	4	3	25	75	100
			B. Web Technology	22UCA6DSE2B						
			C. Data Mining	22UCA6DSE2C						
	Project	Project Work	22UCA6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension Activity		22UGEA	0	1	0	-	-	-
Total					30	28				700
Grand Total					180	150				4400

COURSES & CREDITS FOR BCA PROGRAMME

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil / Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	-	1	
		4400		150

Semester I

Semester I	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS1CC1/ 22UCA1CC1/ 22UIT1CC1	PROGRAMMING IN C	CORE	5	5

Course Objectives

- To understand the basics of C language
- To get the deep knowledge of programming using C language
- To develop logics which will help them to create programs and applications in C
- Enhance skill on problem solving by constructing algorithms

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the basic concepts of C Programming	K1
CO2	Illustrate the components of C programming	K2
CO3	Build algorithms and data structures swiftly and faster computation using programs	K3
CO4	Apply the knowledge of programming concepts to develop programs	K4
CO5	Solve real time problems using C	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	2	3	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	3
CO4	3	2	3	2	2	2	2	2	3	3
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Developing a program in C: Algorithm-Pseudocode-Flowchart-Planning a C program- Writing a C program- Compile and Run a C Program- Overview of C: – Structure of C program – Character set-Tokens – Data types – Variables – Declaration of variables - symbolic constant – Operators and Expressions	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Managing Input and Output Operations: Reading and Writing a character -Formatted Input and Output. Decision Making and Branching: If, Switch, The ?: operator - The GoTo Instruction – Decision Making and Looping: Introduction – While, DO, For Statements –Jumps in Loops.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Array: One dimensional array – Two and multidimensional array – Character array – String functions – User-Defined Functions: Need for User -Defined Functions –A Multi-Function Program-Elements of User-Defined Functions-Definition of Functions –Return values and Their Types-Function Calls- Function Declaration- Category of Functions – Nesting of Functions - Recursion - Storage Class-The scope and lifetime of variables in functions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Structures and Unions: Structure definition – Structure Initialization – Array of structure – Array within structure –Structure within Structure-Union– Pointers: Understanding pointers - Accessing the address of a variable - Declaring and Initializing pointers - Accessing a variable through its pointers - Pointer Expressions - Pointers and Arrays - Pointers and Character strings.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	File Management: Defining and Opening File –Closing a File – I/O operations on Files – error handling during I/O operations – Random Access to Files- Command Line Arguments.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not included for End Semester Examinations) Develop algorithms for real time scenario, Area calculations, Conversion programs, swapping numbers (with and without using temporary variable). Programs for checking eligibility, Triangle formation, Sum of numbers, sum of series, Array manipulations (Sorting, searching, insert, delete and merging), String handling programs, Dynamic memory management using pointers, Employee pay bill preparation using Files.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Balagurusamy.E. (2017). Programming in ANSI C, 7th Edition, Mc Graw Hill Education New Delhi.
2. Byron Gottfried. (2018). Programming with C, 4th Edition, Tata McGraw Hill.

References

1. Yashavant Kanetkar, (2020). Let Us C, 16th Edition, BPB Publications, New Delhi.
2. Ashok N. Kamthane, Amit Ashok Kamthane (2015). Programming in C, 3rd Edition, Pearson India Education Services Pvt. Ltd.

Web References

1. <https://www.learn-c.org/>
2. <https://www.cprogramming.com/>
3. <https://www.tutorialspoint.com/cprogramming/index.htm>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

1. Dr. M. Anandhi, Associate Professor, Department of Information Technology.
2. Ms. R. Sridevi, Assistant Professor, Department of Computer Applications.

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCA1CC1P	C PROGRAMMING – PRACTICAL	CORE	3	3

Course Objectives

- To introduce students to the basic knowledge of programming fundamentals of C language.
- To impart writing skill of C programming to the students and solving problems.
- To impart the concepts like looping, array, functions, pointers and structure.

Course Outcome and Cognitive Level Mapping

On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	COGNITIVE LEVEL
CO1	Identify the logic for a given problem	K1,K2
CO2	Recognize the syntax and construction of C programming code	K1,K2
CO3	Apply the steps involved in compiling, linking and debugging C code	K3,K4
CO4	Analyze the concepts of iteration or looping, branching, array, structure, union and pointers	K4
CO5	Create C programs using all the concepts that have been covered in the theory course	K4

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	2	2
CO3	3	3	3	3	3	3	3	3	2	1
CO4	3	3	3	2	2	3	3	2	2	1
CO5	3	3	3	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

List of Practicals

1. Simple Programs
 - a. Create a C program to display “This is my first C Program”
 - b. Create a C program to add two numbers and display its sum
 - c. Create C program to evaluate each of the following equations.
 - (i) $E = MC^2$.
 - (ii) $S = ut + 1/2at^2$
2. Selection Structures
 - a. Create a C Program to Check Whether a Number is Prime or not
 - b. Create a C program to swap values of two variables with and without using third variable
 - c. Create a C program to compute grade of students using if else ladder. The grades are assigned as followed:

Marks	Grade
marks < 50	F
$50 \leq \text{marks} < 60$	C
$60 \leq \text{marks} < 70$	B
$70 \leq \text{marks} < 80$	B+
$80 \leq \text{marks} < 90$	A
$90 \leq \text{marks} \leq 100$	A+

3. Iterative Structures
 - a. Create a C program to print N Natural numbers
 - b. Create a C program to reverse a given integer
4. Arrays
 - a. Create a C program to find the largest and smallest element in Array
 - b. Create a C program to find the addition of two matrices
5. Function
 - a. Create a C program to calculate factorial of a number using recursion
 - b. Create a C program to find power of a number using recursion
6. Pointers
 - a. Create a C program to find the length of string using pointer
 - b. Create a C program to copy one string to another using pointer
7. Structures
 - a. Create a C program to read and print Student’s Details using Structure
8. Files
 - a. Create a C Program to print the strings using command Line Arguments

Web References

1. <https://www.programiz.com/c-programming/examples>
2. <https://beginnersbook.com/2015/02/simple-c-programs/>
3. <https://www.tutorialgateway.org/c-programming-examples/>
4. <https://www.studytonight.com/c/programs/>

Pedagogy

Power Point Presentations, Demonstrations, Seminars and Practical Sessions.

Course Designer

Ms. V.Infine Sinduja, Assistant Professor, Department of Computer Applications.

FIRST ALLIED COURSE –I (AC)
ESSENTIAL MATHEMATICS
 (For B.Sc Computer Science , B.Sc Information Technology & BCA)
 (2022-2023 and Onwards)

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS1AC1/ 22UCA1AC1/ 22UIT1AC1	ESSENTIAL MATHEMATICS	ALLIED	4	3

Course Objective

- **Apply** the basic concepts of Differentiation, Integration and their applications.
- **Compute** mathematical quantities using ordinary and partial differential equations.
- **Explore** fundamental concepts in graph theory.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Remember and recall the basic concept of essential mathematics.	K1
CO2	Illustrate the various notions in the respective streams .	K2
CO3	Apply the different terminologies of essential mathematics.	K3
CO4	Classify the solution of mathematical problems using various techniques.	K4
CO5	Examine the solution of mathematical problems.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	3	3	2	2

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →
 “3” – Substantial (High) Correlation → “-” indicates there is no correlation.

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Matrices Matrix – Special types of matrices – Scalar multiplication of a matrix – Equality of matrices – Addition of matrices – Subtraction – Multiplication of Matrices – Inverse matrix– Relation between adjoint and inverse matrices – Solution of simultaneous equations – Rank of a matrix – A system of m homogeneous linear equations in n unknowns – System of non-homogeneous linear equations – Eigen values and Eigenvectors – Similar matrices – Cayley-Hamilton Theorem (proof not needed) – Simple applications only</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
II	<p>Differentiation Maxima and Minima (Problems Only) –Points of inflexion. Partial differentiation Functions of function rule – Total Differential Coefficient – A Special case – Implicit Functions – Homogeneous functions – Euler’s Theorem (proof not needed) – Simple problems only.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
III	<p>Integration Integration of Rational algebraic functions – Rule (a) – Rule (b): Type i: $\int \frac{dx}{ax^2+bx+c}$, Type ii: $\int \frac{lx+m}{ax^2+bx+c} dx$ – Integration of Irrational functions : Case (ii) Integration of the form $\int \frac{px+q}{\sqrt{ax^2+bx+c}}$ – Type $\int \frac{dx}{a+b\cos x}$ – Properties of definite integrals.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
IV	<p>Differential Equations Linear Differential Equation with constant coefficients – The Operators D and D^{-1} – Particular Integral – Special methods of finding P.I.: X is of the form (a) e^{ax} (b) $\cos ax$ or $\sin ax$, where a is a constant (c) x^m (a power of x), m being a positive integer (d) $e^{ax}V$, where V is any function of x.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
V	<p>Graph Theory Introduction – Definition of Graphs – Applications of Graphs – Finite and infinite graphs – Incidence and Degree – Isolated Vertex, Pendant Vertex and Null Graph. Path and Circuits Isomorphism – Subgraphs – Walks, Paths and Circuits – Connected Graphs, Disconnected Graphs and Components – Euler graphs.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
VI	<p>Self-Study for Enrichment (Not included for End Semester Examination) Symmetric matrix – Skew symmetric matrix – Hermitian and skew Hermitian matrices Concavity and Convexity– Integration by parts – Linear equation – Hamiltonian Paths and Circuits.</p>	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4

Text Books

1. T.K.Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy.(2015). *Algebra, Volume II*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
2. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume I*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
3. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume II*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
4. S.Narayanan, T.K.Manicavachagom Pillay.(2015).*Calculus,Volume III*. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
5. Narsingh Deo. (2003). *Graph Theory with applications to Engineering and Computer*. Prentice Hall of India Private Limited

UNIT-I	Chapter 2: Section 1 to 5, 7, 8, 10 to 16[1]
UNIT-II	Chapter V: Section 1.1 to 1.5[2] Chapter VIII: Section 1.2 to 1.6[2]
UNIT-III	Chapter 1: Section 7.1 to 7.3, 8 (CASE II), 9, 11[3]
UNIT-IV	Chapter 2: Section 1 to 4[4]
UNIT-V	Chapter 1: Section 1.1 to 1.5[5] Chapter 2: Section 2.1, 2.2, 2.4 to 2.6[5]

Reference Books

1. A.Singaravelu. (2003). *Allied Mathematics*. A.R.Publications
2. P.R.Vittal. (2014). *Allied Mathematics*. Margham Publications, Chennai.
3. S.Arumugam and S.Ramachandran.(2006). *Invitation to Graph Theory*. Sci Tech Publications (India) Pvt Ltd., Chennai

Weblinks

1. <https://youtu.be/rowWM-MijXU>
2. <https://youtu.be/TOvxWaOnrqI>
3. <https://youtu.be/pvLj1s7SOtk>
4. https://youtu.be/Gxr3AT4NY_Q
5. <https://youtu.be/xlbbefbYLzg>
6. <https://youtu.be/b0RJkIBhfEM>
7. <https://youtu.be/s5KZw1EpBEo>

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designers

1. Dr. V. Geetha
2. Dr. S. Sasikala

FIRST ALLIED COURSE-II (AC)

NUMERICAL ANALYSIS AND STATISTICS

(For B.Sc Computer Science , B.Sc Information Technology & BCA)

(2022-2023 and Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCS1AC2/ 22UCA1AC2/ 22UIT1AC2	NUMERICAL ANALYSIS AND STATISTICS	ALLIED	4	3

Course Objective

- **Understand** the implementation of various methods of Numerical Analysis.
- **Organize** and **summarize** the statistical data.
- **Analyze** and **evaluate** the strengths of the conclusions based on data.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	On the successful completion of the course, students will be able to Understand the list of basic ideas of Numerical Methods and Statistics.	K1, K2
CO2	Solve the problems using various methods and also classify the given datas.	K2, K3
CO3	Identify the conceptual collection and classification of variables.	K3
CO4	Analyze the accuracy and graphical representation of statistical datas.	K4
CO5	Support the implementation of numerical methods and statistical datas.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	2
CO2	3	3	2	2	2	3	2	3	2	3
CO3	2	3	3	2	2	2	3	3	2	3
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	2	3	3	3	2	2	3	3

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →
 “3” – Substantial (High) Correlation → “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Solution of Algebraic & Transcendental Equations: Introduction – The Bisection Method – The Iteration Method – Newton-Raphson Method (Problems Only)</p> <p>Interpolation: Finite Differences: Forward Differences, Backward Differences – Newton’s Formulae for Interpolation – Interpolation with unevenly spaced Points: Lagrange’s Interpolation formula</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>Numerical Integration: Numerical Integration: Simpson’s 1/3-Rule – Simpson’s 3/8-Rule (proof not needed).</p> <p>Linear Systems of Equations: Solution of Linear Systems–Direct Methods: Gaussian Elimination Method – Solutions of Linear Systems – Iterative Methods (Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	<p>Numerical solution of Ordinary Differential Equations: Introduction – Euler’s Method – Modified Euler’s Method – Runge-Kutta Methods – Predictor - Corrector Methods : Adams-Moulton Method</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	<p>Measures of Central Tendency: Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean.</p> <p>Measures of Dispersion: Mean Deviation – Standard Deviation (Simple Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

V	<p>Correlation: Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson’s co-efficient of Correlation – Rank Correlation: Spearman’s Rank Correlation Coefficient (Derivation not needed and Simple Problems Only).</p> <p>Linear Regression: Introduction – Linear Regression (Derivation not needed and Simple Problems Only)</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	<p>Self Study for Enrichment: (Not included for End Semester Examination)</p> <p>The method of False Position & Central Differences - Trapezoidal rule - Solution by Taylor’s Series and Milne’s Method - Range – Quartile Deviation - Rank Correlation (Repeated Ranks).</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Sastry S. S. (1998). Introductory methods of Numerical Analysis, Third Edition. Prentice Hall of India Private Limited.
2. Gupta. S.C & Kapoor, V.K (2007). Fundamentals of Mathematical Statistics. Sultan Chand & sons, New Delhi.

- UNIT – I Chapter 2: Sections 2.1 - 2.3(Omit 2.3.1), 2.5(Omit 2.5.1) [1]
Chapter 3: Sections 3.3 (Omit 3.3.4), 3.6, 3.9(3.9.1only) [1]
- UNIT – II Chapter 5: Sections 5.4(5.4.2 & 5.4.3 only) [1]
Chapter 6: Sections 6.3(6.3.2 only) & 6.4 [1]
- UNIT – III Chapter 7: Sections 7.1, 7.4- 7.6 (Omit 7.4.1 & 7.6.2) [1]
- UNIT – IV Chapter 2: Sections 2.5 - 2.9, 2.13 (Omit 2.13.1 & 2.13.2) [2]
- UNIT –V Chapter 10: Sections 10.1 - 10.4, 10.7(10.7.1 Only) [2]
Chapter 11: Sections 11.1 & 11.2 [2]

Reference Books

1. Jain M. K, Iyengar S. R.K. and Jain R.K. (1999). Numerical Analysis Numerical Methods for Scientific and Engineering Computations. New Age International Private Limited.
2. Froberg C.E. (1979). Introduction to Numerical Analysis. II Edition. Addison Wesley

Web Links

1. <https://youtu.be/qCzUXav5Nk>

2. <https://youtu.be/r6MTvrI8SQ4>
3. <https://youtu.be/s05dONL4xAs>
4. <https://youtu.be/XaHFNhHfXwQ>
5. <https://youtu.be/zPG4NjIkCjc>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr.R.Buvaneswari
2. Ms.A.Gowri Shankari

Semester II

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCA2CC2	PROGRAMMING IN JAVA	CORE	5	5

Course Objectives

- To develop logics which will help them to create programs
- To get a deep knowledge of programming using JAVA language
- To understand the basics of OOPs concepts
- Enhance problem solving skill

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Recite the basic programming skills	K1
CO2	Understand the Java features	K2
CO3	Analyze OOPs concepts	K4
CO4	Apply the programming skills in various domains	K3
CO5	Solve real time problems using Java	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	2	2	2	2	2
CO2	3	2	3	1	1	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	2
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Fundamentals of Object-Oriented Programming: Basic Concepts of Object-Oriented Programming - Benefits and Applications of OOP. Java Evolution: Java Features - Java Environment - Overview of Java Language: Java Program Structures, Statements – Implementing A Java Program – Java Virtual Machine –. Constants, Variables and Data Types: Constants- Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants- Type Casting- Getting Values of Variables.	15	CO1, CO2, CO3	K1, K2, K3, K4
II	Operators and Expressions: Introduction - Arithmetic Operators- Relational Operator - Logical Operator - Assignment Operator-increment and decrement Operator-Conditional Operator - Bitwise Operator- Special Operator - Decision Making and Branching: Introduction - Decision making with if statement-Simple if statement -The if ..else Statement- Nesting of if ...else statements- The switch statement - The Conditional Operator(?:Operator) - Decision Making and Looping : While, Do, For Statement, Jump In Loops, Return Statement.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Classes, Objects and Methods: Defining A Class – Fields and Methods Declaration - Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending A Class – Overriding Methods – Final Variables, Methods and Classes – Abstract Methods and Classes – Visibility Control. Arrays, Strings and Vectors: Creating Arrays – One and two Dimensional Arrays Strings – Vectors. Interfaces: Multiple Inheritance: Introduction - Defining Interfaces - Extending Interfaces- Implementation Interfaces - Accessing Interfaces Variables.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Packages: Introduction - Java Packages - Using System Packages- Naming conventions - Creating packages - Accessing a package - Using a Package - Adding a class to a package - Multithreaded Programming: Creating Threads – Extending the Thread Class – Thread- Life Cycle of Thread-Using Thread Method-Thread Priority – Synchronization – Managing Errors and Exceptions: Introduction - Types of Errors - Exceptions-Syntax of Exception Handling code-Multiple Catch Statements.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Graphics Programming using AWT, Swing and Layout Manager: The Graphics Class- Lines and Rectangles- Circles and Ellipses-Drawing Arcs - Drawing Polygons – Introduction to AWT Package – Window Fundamentals – Layout Managers – Introduction to Swing Package – Components and Containers – AWT versus Swing - Database Connectivity: Introduction – JDBC Architecture – Discussion with Example – Overview of JDBC Components.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	UNIT VI - Self Study for Enrichment (Not to be included for External Examination) Comment Line Arguments – Enumerated Types - Finalizer Methods - Applet Programming: Building Applet Code - Applet Life Cycle - Creating and Executable Applet – Designing a Web Page using Applet – Managing Input/Output Files in Java: Stream Classes – Byte Stream Classes – Character Stream Classes – Creation of Files – Reading/Writing Characters – Reading/Writing bytes.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

E. Balagurusamy,(2019). "Programming with JAVA", 6th Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

References

1. S.Sagayaraj, R.Denis, P.Karthik and D.Gajalakshmi,(2017).“Java programming”,Universities Press.
2. Schildt Herbert,(2011).“Java :The Complete Reference”, 8th Edition Tata McGraw-Hill.
3. C.Muthu, (2008).”Programming with JAVA”, Second Edition, McGraw HillEducation
4. Ken Arnold gosling and Davis Holmen,(2005). ”The JAVA Programming Language”,4th Edition, Addison Wesley Pearson Education Publication.

Web References

1. <https://www.javatpoint.com/java-tutorial>
2. <https://www.guru99.com/java-tutorial.html>
3. <https://www.w3schools.com/java/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. A. Jabeen, Assistant Professor, Department of Computer Applications.

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCA2CC2P	JAVA PROGRAMMING – (P)	CORE	3	3

Course Objective

- To impart practical training on Java Programming

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Ability to write the programs using Classes and Objects	K3
CO2	Understand use of Inheritance and Interfaces	K2
CO3	Recognize Package concepts, String and File Handling functions	K2
CO4	Apply Multithreading and Exception Handling concepts.	K3
CO5	Create Swing programs and JDBC connection	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	3	3	2
CO2	3	2	3	1	1	3	3	3	3	2
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	2	3	2	2	2	2	3	3	3
CO5	3	3	3	2	2	3	3	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

List of Practical

- Classes and Objects
- Inheritances
- Interfaces
- Packages
- String Handling
- File Handling
- Multithreading
- Menu and Dialog Box
- Swing Components
- GUI Application with JDBC

Web References

1. <https://www.programiz.com/java-programming/examples>
2. <https://www.geeksforgeeks.org/java-programming-examples/>
3. https://www.w3schools.com/java/java_examples.asp
4. <https://www.w3schools.com/java/>

Pedagogy

Demo and Discussion.

Course Designer

Ms. A. Anandhavalli, Assistant Professor, Department of Computer Applications.

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCA2CC3	DATA STRUCTURES	CORE	3	3

Course Objectives

- To understand the basic concepts of various data structures
- To demonstrate a familiarity with data structures
- To articulate the essential components and operations of the data structures

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, the students will be able to	
CO1	Define the basic concepts of Data Structure	K1
CO2	Demonstrate the operations of Linear and Non-Linear Structure	K2
CO3	Examine the Data Structure operations	K3
CO4	Analyse the various types of Data Structure	K4
CO5	Solve the problem using Different Structures	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	1	1	2	2	2	2	2
CO2	3	2	2	2	1	2	2	2	2	2
CO3	3	3	3	2	2	2	3	2	3	2
CO4	3	3	3	2	2	2	3	2	3	2
CO5	3	3	3	2	2	2	3	2	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no Correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Basic Terminology: Introduction and Overview: Definition-Concept of Data Structures- Overview of Data Structures-Implementation of Data Structures. Arrays: Definition-Terminology-One-dimensional Array – Two-dimensional Arrays.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3
II	Stack & Queue : Overview of Stacks and Queues-Operations on Stack-ADD and DELETE Procedure-Operations on Queue- ADD and DELETE Procedure - Circular Queue – Evaluation of Expressions	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Linked Lists : Overview of Linked list – Representation of Linked List in Memory –Operations: Creating a Linked List-Insertion into a Linked List – Deletion from a Linked List-Polynomial addition – Linked Stacks and Queues.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Trees & Graphs : Trees Terminology – Binary tree representations – Tree Traversal –Graph Terminology – Memory Representations of Graphs – Traversals.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Sorting & Searching : Searching : Sequential Search – Binary Search. Sorting : Insertion Sort- Heap Sort-Quick Sort.	9	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment : (Not to be included for End Semester Examination) Multiple Stacks and Queues - Threaded Binary Trees – Connected Components and Spanning Trees.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

- Debasis Samanta (2018). Classic Data Structures, Second Edition, PHI Learning Private Limited, New Delhi. (Unit I)
- Ellis Horowitz, Sartaj Sahni (2008). Fundamentals of Data Structure, Golgotia Publications, New Delhi.(Unit II,III,IV, V)

References

- Seymour Lipschutz (2011). Data Structures with C, McGraw Hill Education, New York.
- Ashok N. Kamthane (2011).Introduction to Data Structure in C, Pearson Education, Singapore.

Web References

1. <https://www.geeksforgeeks.org/data-structures/>
2. https://www.tutorialspoint.com/data_structures_algorithms/index.htm

Pedagogy

Chalk and Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. R. Brendha, Associate Professor, Department of Computer Applications.

FIRST ALLIED COURSE –III (AC)

OPERATIONS RESEARCH

(For B.Sc Computer Science, Computer Science with Cognitive Systems, BCA & B.Sc Information Technology)

(2022-2023 and Onwards)

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS2AC3/ 22UCG2AC3/ 22UCA2AC3/ 22UIT2AC3/	OPERATIONS RESEARCH	ALLIED	4	3

Course Objective

- **Understand** the various features of Operations research.
- **Analyze** the optimum solutions using Operations research.
- **Explore** the concepts of Operations research in real life problems.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the various techniques of Operations research.	K1
CO2	Illustrate the various notions in the respective streams.	K2
CO3	Identify the different terminologies of Operations research	K3
CO4	Analyze the solutions of mathematical problem using specific techniques.	K4
CO5	Simplify the optimum solutions of a mathematical problem.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	3	3	2	3
CO2	3	2	3	3	2	3	3	3	3	2
CO3	3	2	3	3	2	3	2	3	2	2
CO4	3	2	2	2	2	3	3	2	3	2
CO5	3	2	3	2	2	3	3	3	2	2

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Operations Research Introduction-Origin and Development of O.R.- Nature and Features of O.R.- Scientific Method in O.R.- Modelling in Operations Research - Advantage and Limitation of Models- General Solution Methods for O.R. Models- Methodology of Operations Research- Operations Research and Decision Making</p> <p>Linear Programming Problem- Mathematical Formulation Introduction-Linear programming Problem-Mathematical Formulation of the problem -Illustrations on Mathematical Formulation of LPPs.(simple problems only)</p> <p>Linear programming problem-graphical Solution and Extension Introduction- Graphical Solution Method- General Linear Programming Problem- Canonical and Standard Forms of LPP.</p>	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4
II	<p>Linear Programming Problem-Simplex Method Introduction-Fundamental Properties of Solutions- The computational Procedure- The Simplex Algorithm-Use of Artificial Variables-Big M method.(simple problems only).</p>	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4
III	<p>Transportation problem Introduction-LP Formulation of the Transportation Problem- Existence of Solution in T.P-TheTransportation Table-Loops in Transportation Table-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Economic interpretation of u_j's and v_j's - Degeneracy in Transportation Problem-Transportation Algorithm (MODI method), (simple problems only).</p> <p>Assignment Problem Introduction-Mathematical Formulation of the Problem- Solution Methods of Assignment Problem-Special Cases in Assignment Problems(simple problems only).</p>	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4
IV	<p>Sequencing problem Introduction-Problem of Sequencing-Basic Terms Used in Sequencing- Processing n Jobs through Two Machines- Processing n Jobs through k Machines(problems only).</p>	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4
V	<p>Network Scheduling by PERT/CPM Introduction- Network: Basic Components- Logical Sequencing- Rules of Network Construction-</p>	12	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4

	Concurrent Activities - Critical Path Analysis - Probability Considerations in PERT.			
VI	Self-Study for Enrichment (Not included for End Semester Examination) Application of Operations Research. – Two-Phase method – The Travelling Salesman problem – Processing 2 Jobs through k Machines –. Inventory Models(without shortage)	-	CO1,CO2, CO3,CO4, CO5	K1,K2,K3, K4

Text Books

1. Kanti Swarup, P.K. Gupta, Manmohan.(2019). *Operations research, Sultan Chand Publications.*

Chapters and Sections

UNIT-I Chapter 1: Sections 1:1 – 1:9

Chapter 2: Sections 2:1 – 2:4

Chapter 3: Sections 3:1 – 3:5

UNIT II Chapter 4: Sections 4:1 – 4:4

UNIT-III Chapter 10: Sections 10:1 – 10:3, 10:5, 10:6, 10:8 – 10:13

Chapter 11: Sections 11:1 – 11:4

UNIT-IV Chapter 12: Sections 12:1 – 12:5

UNIT-V Chapter 25: Sections 25:1 – 25:7

Reference Books

1. Hamdy A.Taha (2017), *Operations Research An Introduction*, Pearson India Education services PVT Ltd.
2. Premkumar Gupta, Hira D.S.(2004), *Operations Research*, S.Chand & Company Ltd, New Delhi.
3. Chandrasekhara Rao.K,Shanti Lata Mishra(2008), *Operations Research*, Narosa Publishing House PVT Ltd, New Delhi.

Web References

8. <https://www.britannica.com/topic/operations-research>
9. <https://byjus.com/maths/linear-programming/>
10. <https://www.gatexplore.com/transportation-problem-study-notes/>
11. <https://youtu.be/rowWM-MijXU>
12. <https://youtu.be/TQvxWaOnrqI>
13. https://youtu.be/RTX-ik_8i-k
14. <https://youtu.be/s5KZw1EpBEo>

Pedagogy

Power point presentation, Group discussion, Seminar, Assignment.

Course Designers

3. Dr. V. Geetha
4. Dr. S. Sasikala

**CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC
ISO 9001:2015 Certified
TIRUCHIRAPPALLI – 18**

DEPARTMENT OF COMPUTER APPLICATIONS



*Bachelor of Computer Applications
2021-2022 onwards*

SYLLABUS

I TO VI SEMESTERS



BACHELOR OF COMPUTER APPLICATIONS - PROGRAMME STRUCTURE
(For the Candidates admitted from the academic year 2021-2022 onwards)

Semester	Part	Course	Title	Course Code	Inst. Hours/Week	Credit	Exam Hours	Marks		Total		
								Internal	External			
I	I	Language Course-I (LC)-Tamil / Other Languages (Hindi/Sanskrit/French)	Ikkaalailakkiyam	19ULT1	6	3	3	25	75	100		
			Story, Novel, Hindi Literature-I,& Grammar-I	19ULH1								
			History of Popular Tales, Literature and Sanskrit Story	19ULS1								
			Communication in French-I	19ULF1								
	II	English Language Course - I (ELC)	Functional Grammar for Effective Communication – I	19UE1	6	3	3	25	75	100		
	III	Core Course - I (CC)	Programming with C	21UCA1CC1	6	6	3	25	75	100		
				Core Practical - I (CP)	Practical I -Programming with C	21UCA1CC1P	3	2	3	40	60	100
				First Allied - I (AC)	Essential Mathematics	19UCA1AC1	4	4	3	25	75	100
				First Allied - II (AC)	Numerical Analysis and Statistics	19UCA1AC2	3	-	-	-	-	-
	IV	UGC Jeevan Kaushal Life Skills	Universal Human Values	20UGVE	2	2	3	25	75	100		
Total					30	20				600		
II	I	Language Course-II (LC)-Tamil/Other Languages (Hindi/Sanskrit/French)	daikkaalaIlakkiyamumPuthinamum	19ULT2	6	3	3	25	75	100		
			Prose, Drama, Hindi Literature-II,& Grammar-II	19ULH2								
			Poetry Textual Grammar and Alakara	19ULS2								
			Communication in French-II	19ULF2								
	II	English Language Course - II (ELC)	Functional Grammar for Effective Communication – II	19UE2	6	3	3	25	75	100		
	III	Core Course - II (CC)	Data Structures	19UCA2CC2	6	6	3	25	75	100		
				Core Practical - II (CP)	Practical II -Data Structures Using C	19UCA2CC2P	3	2	3	40	60	100
				First Allied - II (AC)	Numerical Analysis and Statistics	19UCA1AC2	3	3	3	25	75	100
				First Allied - III (AC)	Operations Research	19UCA2AC3	4	2	3	25	75	100
	IV	Environmental Studies	Environmental Studies	21UGES	2	2	3	25	75	100		
V	Extra Credit Course	Swayam Online Course	To be Fixed Later	As per UGC Recommendation								
Total					30	21				700		

Semester	Part	Course	Title	Course Code	Inst. Hours/Week	Credit	Exam Hours	Marks		Total
								Internal	External	
III	I	Language Course - III (LC)-Tamil / Other Languages (Hindi/Sanskrit/French)	KaappiyamumNaadakamum	19ULT3	6	3	3	25	75	100
			Medieval, Modern Poetry & History of Hindi Literature-3	19ULH3						
			Prose, Textual ,Grammar and Vakyarachana	19ULS3						
			Communication in French-III	19ULF3						
	II	English Language Course - III(ELC)	Reading and Writing for Effective Communication-I	19UE3	6	3	3	25	75	100
	III	Core Course - III (CC)	Database Management Systems	19UCA3CC3	6	6	3	25	75	100
		Core Practical - III (CP)	Practical III – DBMS	19UCA3CC3P	3	2	3	40	60	100
		Second Allied - I (AC)	Financial Accounting	19UCA3AC4	4	4	3	25	75	100
		Second Allied - II (AP)	Computer Applications in Business	19UCA3AC1P	3	2	3	40	60	100
	IV	Non-Major Elective – I	Principles of Internet	19UCA3NME1	2	2	3	25	75	100
			Basic Tamil I	19ULC3BT1						
			Special Tamil I	19ULC3ST1						
	V	Extra Credit Course	Swayam Online Course	To be Fixed Later	As per UGC Recommendation					
Total					30	22				700
IV	I	Language Course-IV (LC)-Tamil /Other Languages ((Hindi/Sanskrit/French)	PandaiyaIlakkiyam	19ULT4	6	3	3	25	75	100
			Letter writing, General Essays, Technical Terms, Proverbs, Idioms &Pharses, Hindi Literature-4	19ULH4						
			Drama, History of Drama Literature	19ULS4						
			Communication in French-IV	19ULF4						
	II	English Language Course - IV(ELC)	Reading and Writing for Effective Communication-II	19UE4	6	3	3	25	75	100
	III	Core Course - IV (CC)	Programming with Java	19UCA4CC4	6	6	3	25	75	100
		Core Practical - IV (CP)	Practical IV -Programming with Java	19UCA4CC4P	3	2	3	40	60	100
		Second Allied - III (AC)	Organizational Behaviour	19UCA4AC5	5	3	3	25	75	100
	IV	Non-Major Elective – II	HTML Practicals	19UCA4NME2P	2	2	3	40	60	100
			Basic Tamil II	19ULC4BT2				25	75	
			Special Tamil II	19ULC4ST2						
		Skill Based Elective – I	Animation Practicals	19UCA4SBE1AP	2	2	3	40	60	100
	HTML5 Practicals	19UCA4SBE1BP								
V	Extra Credit Course	Swayam Online Course	To be Fixed Later	As per UGC Recommendation						
Total					30	21				700

V	III	Core Course -V (CC)	Web Programming with PHP	19UCA5CC5	5	5	3	25	75	100
		Core Course - V (CP)	Practical V -PHP with MySQL	19UCA5CC5P	4	3	3	40	60	100
		Core Course - VI (CC)	Operating Systems	19UCA5CC6	5	5	3	25	75	100
		Core Course - VII (CC)	Software Engineering	19UCA5CC7	5	5	3	25	75	100
		Major Based Elective – I	Cloud Computing	19UCA5MBE1A	5	5	3	25	75	100
	Introduction to Data Mining and Data Warehousing		19UCA5MBE1B							
	Artificial Intelligence		19UCA5MBE1C							
	IV	Skill Based Elective – II	Practical - PC Packages	19UCA5SBE2AP	2	2	3	40	60	100
			Practical - Corel Draw	19UCA5SBE2BP						
		Skill Based Elective – III	Mobile Applications Development Lab	19UCA5SBE3AP	2	2	3	40	60	100
			Practical-Multimedia Systems	19UCA5SBE3BP						
		UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100
	v	Extra Credit Course	Swayam OnlineCourse	To be Fixed Later	As per UGC Recommendation					
Total					30	29				800
VI	III	Core Course - VIII (CC)	Computer Networks	19UCA6CC8	6	5	3	25	75	100
		Core Course - IX (CC)	Internet of Things	19UCA6CC9	6	5	3	25	75	100
		Major Based Elective – II	Python Programming	19UCA6MBE2A	6	5	3	25	75	100
			R Programming for Data Analysis	19UCA6MBE2B						
			Digital Marketing	19UCA6MBE2C						
	Major Based Elective – III	Practical-Python Programming	19UCA6MBE3AP	5	5	3	40	60	100	
		Practical-R Programming	19UCA6MBE3BP							
		Practical- Dot Net Programming	19UCA6MBE3CP							
	Project Work	Project Work	19UCA6PW	6	5	-	-	-	100	
	IV	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
v	Extension Activity		19UGEA	0	1	0	-	-	-	
	Swayam online course	As per UGC Recommendations								
Total					30	26				600
Total					180	140				4100

SEMESTER I

CORE COURSE – I (CC)
PROGRAMMING WITH C

Semester: I

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
21UCA1CC1	Programming with C	Core	90	6	-	6

PREAMBLE

- To understand the concepts of C and to develop the programming skill in C programming

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain the program structure, programming rules, C tokens and syntax.	K2
CO2	Apply decision making and looping statements in C Program.	K3
CO3	Utilize the concept of arrays and functions.	K3
CO4	Identify the role of structure, union and pointers.	K3
CO5	Make use of the file operations.	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	S	S	M	M
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I: BASIC CONCEPTS

(18 HOURS)

Overview of C: Constants, Variables, and Data Types: Introduction - Identifiers – Constants – Variables - Data Types – Declaration of Variables –Assigning Values to Variables-Defining Symbolic Constant. **Operators and Expressions:** Arithmetic, Relational, Logical, Assignment, Conditional, Bit Wise, Special, Increment and Decrement Operators - Arithmetic Expressions - Evaluation of Expressions–Precedence of Arithmetic Operators - Operator Precedence & Associativity.

UNIT II: INPUT AND OUTPUT OPERATIONS AND BRANCHING

(18 HOURS)

Managing Input and Output Operations: Reading and Writing a Character -Formatted Input and Output. **Decision Making and Branching:** Decision Making with If Statement, Simple If Statement, If... Else Statement, Nested If... Else Statement, The Else if Ladder, Switch, The ?: operator – The GoTo Instruction.

UNIT III: LOOPING AND ARRAYS

(18 HOURS)

Decision Making and Looping: Introduction – While, Do, For Statements –Jumps in Loops. **Arrays:** One-Dimensional - Two Dimensional - Multidimensional Arrays. **Character Arrays and Strings:** Declaring and Initializing String Variables - Reading Strings from Terminal - Writing Strings to Screen - String-Handling Functions.

UNIT IV: FUNCTIONS AND STRUCTURES

(18 HOURS)

User-Defined Functions: Need for User -Defined Functions –A Multi-Function Program- Elements of User-Defined Functions-Definition of Functions –Return values and Their Types-Function Calls- Function Declaration Category of Functions –Nesting of Functions - Recursion - Storage Class-The Scope and Lifetime of Variables in Functions. **Structure and Unions:** Defining a Structure –Declaring Structure Variables - Accessing Structure Members- Initialization - Comparison of Structure Variables- Unions.

UNIT V: POINTERS AND FILES

(18 HOURS)

Pointers: Understanding pointers - Accessing the Address of a Variable - Declaring and Initializing Pointers - Accessing a Variable Through its Pointers – Chain of Pointers -Pointer Expressions. **File Management in C:** Defining and Opening a File –Closing a file - I/O Operations on Files.

TEXT:

E. Balagurusamy, “Programming in ANSI C”, TMH Publishing Pvt., Ltd., 7th Edition, 2017.

REFERENCES:

1. Yashavant Kanetkar, “Let Us C”, BPB Publications, New Delhi, 16th Edition, 2020.
2. Byron S. Gottfried, “Programming with C”, McGraw Hill Education, 2nd Edition, 2008.

WEB REFERENCES:

1. www.learn-c.org
2. www.cprogramming.com
3. www.zentut.com/c-tutorial

COURSE DESIGNER

Dr. R. Brendha, Associate Professor, Department of Computer Applications.

CORE PRACTICAL – I (CP)

PRACTICAL I -PROGRAMMING WITH C

Semester: I

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
21UCA1CC1P	Practical I - Programming with C	Core	45	-	3	2

PREAMBLE:

- To recognize the knowledge on basic concepts of C Programming

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Relate looping structure with arrays.	K1
CO2	Demonstrate the concept of basic C operators and functions.	K2
CO3	Utilize the concepts of structures, union, pointers and file.	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	M
CO2	M	M	M	M
CO3	S	S	S	M

S – Strong; M – Medium; L - Low

LIST OF PRACTICALS

1. Formulae Conversion

- 1.1 Simple Interest
- 1.2 Fahrenheit to Celsius
- 1.3 Days into Years and Weeks

2. Selection Structure

- 2.1. Simple If
- 2.2. If-else
- 2.3. Else-if Ladder
- 2.4. Ternary Operator
- 2.5. Switch

3. Iterative Structure

- 3.1. For
- 3.2. While
- 3.3. Do – While

4. Arrays

- 4.1. One-Dimensional Array
- 4.2. Two-Dimensional Array

5. Functions

- 5.1. With Recursion
- 5.2. Without Recursion
- 5.3. String Functions

6. Structures

7. Unions

8. Pointers

9. File

COURSE DESIGNER

Dr. R. Brendha, Associate Professor, Department of Computer Applications.

ALLIED COURSE – I (AC)

ALLIED I -ESSENTIAL MATHEMATICS

SEMESTER - I

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA1AC1	Essential Mathematics	Allied	60	4	-	4

PREAMBLE

- To equip the students with mathematical methods formatted for their major concepts and train them in basic Differentiations and Integrations.

COURSE OUTCOME

- On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	State the basic concepts of graph theory	K1
CO2	Explain the concepts of Matrices and its types	K2
CO3	Compute characteristic equation of a matrix and its inverse by Cayley Hamilton theorem	K3
CO4	Apply Differentiation to find the solutions of Ordinary and Partial Differentiation	K3
CO5	Classify the various types of integrals	K3
CO6	Solve different types of ordinary differential equation	K3
CO7	Classify the characteristics of graph theory	K3

COURSE OUTCOME MAPPED WITH PROGRAMME OUTCOME

	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	M
CO3	S	S	S	S
CO4	S	M	M	M
CO5	S	S	S	M
CO6	S	S	M	M
CO7	S	S	S	S

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I : (12 hours)

Matrices : Singular matrices – Inverse of a non-singular matrix using adjoint method - Rank of a Matrix – Consistency - Characteristic equation, Eigen values, Eigen vectors – Cayley Hamilton's Theorem (proof not needed) – Simple applications only

UNIT II : (12 hours)

Differentiation: Maxima & Minima – Concavity, Convexity – Points of inflexion - Partial differentiation – Euler's Theorem - Total differential coefficients (proof not needed) – Simple problems only.

UNIT III : (12 hours)

Integration: Evaluation of integrals of types

$$(1). \int \frac{px + q}{ax^2 + c} dx \quad (2). \int \frac{px + q}{\sqrt{ax^2 + bx + c}} dx \quad (3). \int \frac{dx}{a + b \sin x} \quad (4). \int \frac{dx}{a + b \cos x}$$

Evaluation using Integration by parts – Properties of definite integrals.

UNIT IV: (12 hours)

Differential Equations: Variables Separables – Linear equations – Second order of types $(aD^2 + bD + c)y = F(x)$ where a, b, c are constants and $F(x)$ is one of the following types (i) e^{kx} (ii) $\sin(kx)$ and $\cos(kx)$ (iii) x^n , n being an integer (iv) $e^{kx}f(x)$

UNIT V: (12 hours)

Graph Theory: Basic concepts- Finite and infinite graphs-Incidence and degree ideas on vertices – Isomorphism, Sub graphs, Walks – Paths and Circuits – Euler graphs.

TEXT BOOKS:

1. T.K. Manickavasagam Pillai and others, "Algebra, Volume II", S. Viswanathan Pvt Limited, 1985.
2. S. Narayanan, T.K. Manickavasagam Pillai, "Calculus, Volume I", S. Viswanathan Pvt Limited, 2003.
3. S. Narayanan, T.K. Manickavasagam Pillai, "Calculus, Volume II", S. Viswanathan Pvt Limited, 2003.
4. S. Narayanan, T.K. Manickavasagam Pillai, "Calculus, Volume III", S. Viswanathan Pvt Limited, 2003.
5. Narsingh Deo, "Graph Theory", Hall of India Pvt Ltd, 1997.

REFERENCE BOOKS:

1. A. Singaravelu, "Allied Mathematics", A.R. Publications, 2003.
2. P.R. Vittal, "Allied Mathematics", Margham Publications, Chennai, 2014.
3. S. Arumugam and S. Ramachandran, "Invitation to Graph Theory", SciTech Publications (India) Pvt Ltd., Chennai, 2006.

COURSE DESIGNER:

Dr. V. Geetha and Dr. S. Sasikala - Department of Mathematics

ALLIED COURSE – II (AC)

ALLIED II- NUMERICAL ANALYSIS AND STATISTICS

SEMESTER - I

CourseCode	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA1AC2	Numerical Analysis And Statistics	Allied	90	3	-	-

PREAMBLE

- To train the students in numerical and statistical problems

COURSE OUTCOME

- On the successful completion of the course, students will be able to

CONumber	COStatement	KnowledgeLevel
CO1	Explain the concept of measures of central tendency and dispersion	K2
CO2	Apply numerical methods to solve Algebraic, Transcendental equations and Interpolation	K3
CO3	Compute the numerical solution of ordinary differential equation by various method	K3
CO4	Solve numerical integration and system of linear equation by appropriate methods.	K3
CO5	Explain correlation and regression and solve the numerical problems.	K3

COURSE OUTCOME MAPPED WITH PROGRAMME OUTCOME

	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	M
CO3	S	S	S	M
CO4	S	S	S	M
CO5	S	S	S	S

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I

(18 Hours)

Solution of Algebraic & Transcendental equations: Introduction - Bisection Method, Method of False Position, Iteration method, Newton Raphson Method (Problems Only)

Interpolation: Finite differences –Forward, Backward and Central differences – Newton’s formulae for interpolation - Lagrange’s interpolation formula.

UNIT II

(18 Hours)

Numerical differentiation & Integration: Numerical Integration using Trapezoidal rule and Simpson’s($\frac{1}{3}$ and $\frac{3}{8}$) rules (proof not needed)

Numerical Linear Algebra: Solutions to Linear Systems –Gauss Elimination and Gauss Jordan method –Iterative methods (Problems Only)

UNIT III

(18 Hours)

Numerical solution of Ordinary Differential Equations : Introduction - Solution by Taylor Series Method ,Picard’s method of successive approximations, Euler’s Method, Modified Euler’s Method - Runge - Kutta method- Predictor Corrector Method -Adams –Moulton method and Milne’s Method.

UNIT IV

(18 Hours)

Measures of Central Tendency: Arithmetic Mean – Median - Mode - Geometric Mean – Harmonic Mean. Measures of Dispersion: Range- Quartile Deviation - Mean Deviation, Standard Deviation.

UNIT V

(18 Hours)

Correlation: Introduction - Meaning of Correlation – Scattered Diagram – Karl Pearson’s co-efficient Correlation – Rank Correlation

Linear Regression: Introduction – Linear Regression –Regression Coefficients and its equations(Problems Only)

TEXT BOOKS:

1. S.S.Sastry, “Introductory methods of Numerical Analysis” , fifth Edition, PHI Learning private limited, 2013.
2. Gupta.S.C&Kapoor, V.K, “Fundamentals of Mathematical Statistics”, Sultan Chand& sons, New Delhi, 1994.

REFERENCE BOOKS:

1. M.K. Jain, S.R.K. Iyengar and R.K. Jain, “Numerical Methods for Scientific and Engineering Computations”, New Age International Private Limited, 1999.
2. C.E. Froberg, “Introduction to Numerical Analysis”, II Edition, Addison Wesley, 1979.

COURSE DESIGNER:

Dr.V.Geetha and Dr.S.Sasikala - Department of Mathematics

SEMESTER II

CORE COURSE – II (CC)**DATA STRUCTURES****SEMESTER -II**

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA2CC2	Data Structures	Core	90	6	-	6

PREAMBLE

- To understand the concepts of data structures

COURSE OUTCOMES (CO)

- On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain basics of data structures.	K1
CO2	State the operations of various data structures.	K1
CO3	Make use of the stack, queue and linked lists.	K2
CO4	Apply traversal concept on trees and graphs.	K3
CO5	Utilize arrays in sorting and searching.	K3

MAPPING WITH PROGRAMME OUTCOMES

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	S	S	S	M
CO3	S	S	S	L
CO4	S	S	S	L
CO5	S	S	S	M

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I: BASIC TERMINOLOGY

(20 HOURS)

Introduction and Overview: Introduction- Basic Terminology- Data Structures- Data Structure Operations. Arrays: Linear Arrays – Representation of Linear Arrays in Memory – Traversing Linear Arrays- Inserting & Deleting – Multi Dimensional Arrays.

UNIT II: LINKED LISTS

(15 HOURS)

Linked Lists: Linked Lists – Representation of Linked List in Memory – Traversing a Linked list- Searching a Linked List- Memory allocation; Garbage Collection-Insertion into a Linked List – Deletion from a Linked List.

UNIT III: STACKS and QUEUES

(20 HOURS)

Stacks and Queues: Introduction – Stacks – Array Representation of Stacks – Linked Representation of Stacks – Arithmetic Expression; Polish Notation-Application of Stacks-Recursion. Queues – Linked Representation of Queues-Queue as ADT- Deques.

UNIT IV: TREES

(15 HOURS)

Trees: Introduction – Binary Trees – Representing Binary Trees in Memory – Traversing Binary Trees – Traversal Algorithms using Stacks-Binary Search Trees-Balanced Binary Trees-Applications of Trees.

UNIT V: GRAPHS

(20 HOURS)

Graphs and their applications: Introduction – Graph Theory Terminology – Sequential Representation of Graphs – Linked representation of a Graph- Operations on Graphs – Traversing a Graph. Sorting and Searching – Bubble Sort-Insertion Sort. Searching - Linear Search – Binary Search.

TEXTBOOK

Seymour Lipschutz, “**Data Structures with C**”, McGraw Hill Education, 2011

REFERENCES

1. Ellis Horowitz, Sartaj Sahni, “**Fundamentals of Data Structures**”, Galgotia Publications, 2008.
2. Anany Levitin, “**Introduction to the Design and Analysis of Algorithms**”, Pearson Education, 2nd edition, 2011.
3. Ashok N.Kamthane, “**Introduction to Data Structure in C**” Pearson Education, 2011(Singapore)
4. www.studytonight.com/data-structures

COURSE DESIGNER

Ms.H.Krishnaveni , Associate Professor, Department of Computer Applications

CORE PRACTICAL – II (CP)
PRACTICAL II -DATA STRUCTURES USING C

SEMESTER-II

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA2CC2P	Practical II - Data Structures Using C	Core	45	-	3	2

PREAMBLE

- To impart practical training on data structures using C

COURSE OUTCOMES (CO)

- On successful completion of the course, students will be able to

CO NUMBER	COSTATEMENT	KNOWLEDGE LEVEL
CO1	Recall operations of various data structures using C programming.	K1
CO2	Describe sorting and searching techniques using array.	K2
CO3	Apply the concepts of traversal on trees and graphs.	K3

MAPPING WITH PROGRAMME OUTCOMES

	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	M
CO2	S	S	S	L
CO3	S	S	S	M

S – Strong; M – Medium; L - Low

LIST OF PRACTICALS

- Matrix representation and manipulation

2. Sorting algorithms
3. Searching algorithms
4. Stack representation and manipulation
5. Queue representation and manipulation
6. Linked list representation and manipulation
7. Binary tree traversal
8. Graph traversal

COURSE DESIGNER

Ms. H. Krishnaveni, Associate Professor, Department of Computer Applications

ALLIED COURSE – III (AC)
OPERATIONS RESEARCH

SEMESTER-II

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA2AC3	Operations Research	Allied	60	4	-	3

PREAMBLE

- To inculcate the basic concepts of Operations Research
- To practice the students for solving Operation Research Problems

COURSE OUTCOME

- On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the applications of Operations research.	K2
CO2	Solve Linear Programming Problem by graphical method	K3
CO3	Classify the different types of Simplex methods	K3
CO4	Describe the concepts of Transportation Problem and Assignment Problem and compute the solution by various methods	K3
CO5	Compute PERT and CPM in Network Analysis	K3
CO6	Determine the solution of Sequencing Problem	K4

COURSE OUTCOME MAPPED WITH PROGRAMME OUTCOME

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	M
CO2	S	S	S	S
CO3	S	M	S	M
CO4	S	S	S	S
CO5	S	S	S	S
CO6	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS

UNIT I

(12 Hours)

Operations Research: Introduction - Basics of OR – OR & decision making –Role of Computers in OR. Linear Programming Problem: Linear programming formulations & graphical solution of two variables - Canonical & standard forms of LPP.

UNIT II

(12 Hours)

Linear Programming Problem: Introduction - Simplex Method for $<$, $=$, $>$ constraints – Two phase Simplex method – Big M Method.

UNIT III

(12 Hours)

Transportation problem: Introduction - Transportation algorithm – Degeneracy algorithm – Degeneracy in Transportation Problem, Unbalanced transportation problem.

Assignment Problem: Introduction - Assignment algorithm –Unbalanced Assignment problem- The Travelling Salesman Problem.

UNIT IV

(12 Hours)

Sequencing problem: Introduction - Processing of n jobs through two machines – Processing of n jobs through k machines – processing of two jobs through k machines.

UNIT V (12 Hours)

Network Scheduling by PERT/CPM: Introduction - Network – Fulkerson's rule - measure of activity –PERT computation– CPM computation

TEXT BOOK:

1. Kantiswarup P.K.Gupta & Man Mohan, "Operations Research", Sultan Chand Publishers, New Delhi,2008.

REFERENCE BOOKS:

1. Prem Kumar Gupta and D.S. Hira, Operations Research: An Introduction, S. Chand and Co.,Ltd, New Delhi, 1983.
2. Hamdy A. Taha, "Operations Research", McMillan Publishing Company, New Delhi, 1982.

COURSE DESIGNER:

Dr.V.Geetha and Dr.S.Sasikala,Department of Mathematics

SEMESTER III

CORE COURSE-III (CC)
DATABASE MANAGEMENT SYSTEMS

SEMESTER - III

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA3CC3	Database Management Systems	Core	90	6	-	6

PREAMBLE:

- To understand the basic concepts of the database systems
- To learn the features of relational model and ER model
- To develop SQL queries for a database
- To apply the basic normalization techniques

COURSE OUTCOMES:

- On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain the basic concepts of database design, architecture and its model	K2
CO2	Illustrate structure of relational database	K2
CO3	Apply the various SQL queries in the database	K3
CO4	Implement the concepts of ER model and its diagram	K3
CO5	Relate the concept of transaction management in a database environment	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES (PSO):

	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	M
CO2	M	M	S	M
CO3	S	M	M	S
CO4	S	M	M	M
CO5	S	S	S	L

S– Strong; M– Medium; L - Low

SYLLABUS

UNIT I: INTRODUCTION

(18 HOURS)

Introduction to DBMS: Applications of DBMS - Purpose of DBMS - View of Data- Database Languages - Relational Databases - Database Design - Data Storage & Querying- Transaction Management - Database Architecture - Database Users and Administrators.

UNIT II: RELATION MODEL

(18 HOURS)

Introduction to Relation Model: Structure of Relational Databases - Database Schema - Keys - Schema diagrams - Relational Query Languages: Relational Operators - Relational Algebra.

UNIT III: STRUCTURED QUERY LANGUAGE

(18 HOURS)

Introduction to SQL: SQL Data Definition - Basic Structure of SQL Queries - Additional basic Operations - Set Operations - NULL Values - Aggregate Functions - Nested Sub Queries - Modification of Database. **Intermediate SQL:** Join Expressions - Views - Transactions - Integrity Constraints - SQL data types and Schemas - Authorization.

UNIT IV: ER MODEL & FUNCTIONAL DEPENDENCY

(18 HOURS)

Database design and ER-Model: Overview of design process - ER Model - Constraints - ER Diagram - Reduction to Relational Schemas - ER design issues - **Relational Database Design:** Features of Good Relational Design - Atomic Domains and First Normal Form - Decomposition using Functional Dependencies - Functional Dependency Theory - Algorithms for Decomposition.

UNIT V: TRANSACTION MANAGEMENT

(18 HOURS)

Transaction Management: Transaction Concepts - Storage Structure - Transaction Atomicity and Durability - Transaction Isolation - Serializability.

TEXT:

1. Abraham Silberschatz, Henry F. Korth & S. Sudarshan, "Database System Concepts", 6th edition, McGraw Hill Education (India) Private Limited, 2013

REFERENCES:

1. "An Introduction to Database" - C.J. Date, A. Kannan & S. Swamynathan, Pearson Education, India, 2009
2. "Essentials of Database Management Systems" - Alexis Leon, Mathews Leon, McGraw Hill Education India Pvt Ltd., Revised Edition 2009.
3. "Database System Concepts", Peter Rob, Carlos Coronel, Lengage Learning, 2008

WEB REFERENCES:

1. <https://beginnersbook.com/2015/04/dbms-tutorial/>
2. <https://www.studytonight.com/dbms/>
3. <https://www.tutorialspoint.com/dbms/>
4. <https://www.w3schools.in/dbms/>

COURSE DESIGNER

Ms .Lakshna Arun- Assistant Professor, Department of Computer Applications

**CORE PRACTICAL –III (CP)
PRACTICAL III- DBMS**

SEMESTER - III

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA3CC3P	Practical III –DBMS	Core	45	-	3	2

OBJECTIVE

- To provide in depth programming knowledge in MYSQL

COURSE OUTCOMES

- On successful completion of the course, students will be able to

CONUMBER	COSTATEMENT	KNOWLEDGE LEVEL
CO1	Recall DDL and DML Commands	K1
CO2	Apply Arithmetic, Logical and Set operators	K3
CO3	Implement string operations	K3
CO4	Use Aggregate Functions in SQL Queries	K3
CO5	Create Nested Subqueries	K5

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES (PSO):

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	M
CO2	S	M	S	M
CO3	S	M	S	S
CO4	S	L	M	M

S– Strong; M– Medium; L - Low

LIST OF PRACTICALS

1. Create a table and perform the following DDL operations
 - a) Set the primary key
 - b) Alter the structure of the table
 - c) Drop the table
2. Create a table and perform the following DML operations
 - a) Insert values
 - b) Update values and Delete records based on constraints
 - c) Display values using various forms of select clause
3. Perform Arithmetic, Logical and Set operations
 - a) Arithmetic Operators
 - b) AND, OR, NOT Operators
 - c) UNION, INTERSECTION, MINUS
4. Implement Nested Sub queries
 - a) Set membership (in, not in)
 - b) Set comparison (some, all)
 - c) Empty relation (exists, not exists)
 - d) Check for existence of Duplicate tuples (unique, not unique)
5. Develop MySQL Queries to implement Aggregate Functions.
6. Implement Grouping and Ordering Commands in a Table.
7. Develop MySQL Queries for View Operations.
8. Develop MYSQL queries to implement String operations using % and “_”
[Note: create necessary tables for the above questions (1 to 8) with required attributes]
9. Consider the following relations for a Banking enterprise database

BRANCH(branch-name:string, branch-city:string, assets:real)

ACCOUNT(accno:int, branch-name:string, balance:real)

DEPOSITOR(customer-name:string, accno:int)

CUSTOMER(customer-name: string, customer-street: string, customer-city:string)

Perform the following operations:

- a) Create the above relations by properly specifying the primary keys and the Foreign keys

- b) Enter at least five tuples for each relation
- c) Find all the customers who have at least two accounts at the main branch
- d) Find all the customers who have an account at *all* the branches located in a specific city.
- e) Generate suitable reports

COURSE DESIGNER

Ms.Lakshna Arun- Assistant Professor, Department of Computer Applications

**ALLIED COURSE – II
FINANCIAL ACCOUNTING**

SEMESTER - III

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA3AC4	Financial Accounting	Allied	45	4	-	4

COURSE OBJECTIVE

- To equip the students with fundamental knowledge and acquire analytical skills on the accounting concepts.

COURSE OUTCOME

- On the successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO 1	Define the basic concepts of Accounting	K1
CO2	Explain the accounting rules required for business enterprise	K2
CO3	Develop the skills in preparation of financial reports	K3
CO4	Analyze various methods of depreciation	K4

MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	S	M
CO2	S	S	S	S	M
CO3	S	S	S	S	S
CO4	S	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS

UNIT – I INTRODUCTION

(12 HOURS)

Accounting Meaning – Need for Accounting – Users of Accounting Information – Meaning of Book Keeping – Accounting Principles – Accounting Cycle – Phases of Accounting – Accounting Equation. Double Entry: Meaning – Nature and Principle of Double Entry. Journal: Meaning and Need – Steps in Journalizing – Exercises of Journal Entry. Subsidiary Books: Meaning – Classification and Advantages.

UNIT – II LEDGER & TRIAL BALANCE

(12 HOURS)

Ledger: Meaning and Difference between Journal and Ledger – Steps in Posting – Problems on Journal, Ledger and Trial Balance. Trial Balance: Meaning and Objective of Preparing Trial Balance – Comprehensive Problems on Journal, Ledger and Trial Balance.

UNIT – III CASH BOOK & BANK RECONCILIATION STATEMENT (BRS)

(12 HOURS)

Cash Book: Meaning – Objectives and Classification – Difference between Cash and Trade Discount – Problems on Triple Column Cash Book. Bank Reconciliation Statement (BRS): Meaning – Causes for Difference between Cash and Pass Book Problems.

UNIT – IV FINAL ACCOUNTS

(12 HOURS)

Meaning – Need for Preparation – Components of Final Accounts – Problems with Adjustments.

UNIT – V DEPRECIATION

(12 HOURS)

Meaning – Need for Providing Depreciation – Problems on Straight Line Method, Diminishing Balance Method and Annuity Method.

TEXT:

Fundamentals of Accounting, S.P.Jain and K.L.Narang, Kalyani Publishers, 2017

REFERENCES:

Financial Accounting, T.S. Reddy & Murthy, Margham Publications, 2017

COURSE DESIGNER

Ms. Shilpa A. Talreja – Assistant Professor, Department of Commerce.

ALLIED COURSE – II
COMPUTER APPLICATIONS IN
BUSINESS

SEMESTER - III

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA3AC1P / 19UIT3AC1P	Computer Applications in Business	Allied	45	-	3	2

COURSE OBJECTIVE

- The primary objective of this course is to expose the students with the Accounting Software TallyERP9with GST.

COURSE OUTCOME

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Recall the basic concepts of components of computer	K1
CO2	Understand the basic features of Tally ERP9	K2
CO3	Prepare different types of financial reports	K3
CO4	Analyse stock group, stock category, stock item and compare stock category summary with godown summary.	K4
CO5	Explain the procedure for GST Registration.	K5

SYLLABUS

UNIT– I INTRODUCTION TO COMPUTERIZED ACCOUNTING

Introduction to computerized Accounting – Features – Advantages – Manual Accounting Vs. Computerized Accounting – Accounting transaction – Journal Entry – Ledgers – Trial Balance – Balance Sheet.

UNIT – II INTRODUCTION TO TALLY

Opening Tally screen – Gate way of Tally – Features of Tally – Creation of Company – Selectinga Company – Altering / Modifying existing company – Configuration of Tally – Tally screen and Menu.

UNIT – III CREATION OF LEDGERS, GROUPS & VOUCHER ENTRIES

Creation of Ledger – Group – Voucher – Displaying – Altering – Deleting – Introduction to Voucher entries – Contra Voucher – Payment Voucher – Receipt Voucher – Journal Voucher – Sales Voucher – Recording transaction of sample data.

UNIT – IV COST CATEGORIES & COST CENTRE

Introduction to Cost – Creation of cost Categories – Creation of Cost Centre – Editing – Deleting - Usage of Cost Category and Cost Centres in voucher entry.

UNIT– V GST & GENERATING REPORTS

Introduction to GST – Registration - Creating Company with GST – Creating Tax Ledgers- Recording GST Sales – Financial Reports: Trial Balance – Profit & Loss – Balance Sheet - Bank Reconciliation Statement - Stock Summary.

LIST OF PRACTICALS:

1. Creation, alteration and deletion of companies and user defined accounting groups.
2. Creation, alteration and deletion of ledger Accounts.
3. Preparation of Final Accounts with adjustments.
4. Voucher entries in double entry mode.
5. Creation, alteration and deletion of inventory masters.
6. Generating Accounting and Inventory Reports.
7. GST Registration and E-filing of returns.

TEXT BOOK

S.No.	Auth ors	Title	Publishers	Year of Publication
1.	Computer Applications in Business	V. Srinivasa Vallabhan	Sultan Chand & Sons	2014
2.	Computer Application by Implementing Tally ERP	A.K. Nadhani	BPB Publications, Chennai.	2015
3.	Windows and MS Office with Database Concepts	N. Krishnana	Scitech Publications	2001

REFERENCE BOOK

S.No.	Authors	Title	Publishers	Year of Publication
1.	Computer Applications in Business	K. Mohankumar & S.Rajkumar	Vijay Nicole Imprints (P)Ltd	2018
2.	Tally ERP 9	Dr. Pl Rizwan Ahmed	Margham Publications	2016
3.	Computer Application in Business	Dr. Joseph Anbarasu	Learn Tech Press	2007

COURSE DESIGNER

Ms. J. Lalithambigai – Assistant Professor, Department of Commerce.

NON-MAJOR ELECTIVE –I**PRINCIPLES OF INTERNET****Semester: III**

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA3NME1	Principles of Internet	NME-I	30	2	-	2

OBJECTIVES

- To understand the architecture of Internet
- To brief the concepts of network and WWW
- To expose students about entertainment on Internet with security

COURSE OUTCOMES

On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	State the dangers in Internet	K1
CO2	Understand the architecture of Internet	K2
CO3	Utilize the Internet	K3
CO4	Discuss on Internet tools	K2
CO5	Apply Internet for entertainment & multimedia	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES (PSO):

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	M
CO2	M	M	M	M
CO3	M	S	S	M
CO4	S	M	S	M
CO5	S	S	S	S

S– Strong; M– Medium; L - Low

UNIT I: ARCHITECTURE OF INTERNET**(6 HOURS)**

Understanding the Internet's Underlying Architecture: What is Internet? - How computer networks send data across the internet? - How TCP/IP works?

UNIT II: CONNECTING TO THE INTERNET**(6 HOURS)**

How computers connect to the Internet? - How wireless connections and WIFI works? - How Home networks work?

UNIT III: USING THE WORLD WIDE WEB**(6 HOURS)**

How Google works? - How map sites work? - How Wikis and Wikipedia work? - Using common internet tools: How telnet works? - How FTP works? - How agents work? - How CGI scripting works?

UNIT IV: ENTERTAINMENT AND MULTIMEDIA ON THE INTERNET (6 HOURS)

How music and audio works on the Internet? - How music sharing and file sharing? - How animation ontheweb works? - Shopping and doing business on the Internet.

UNIT V: PROTECTING YOURSELF ON THE INTERNET**(6 HOURS)**

How firewalls work? - How hackers can cripple the Internet and attack your PC? - The dangers of wireless networking -How viruses work? - Parental controls on the Internet.

TEXT:

1. How the Internet Works? - Preston Gralla, Pearson Education, 8th Edition

REFERENCES:

1. "Internet for Everyone"- Alexis Leon, S.Chand (G/L)& Company; 2nd Edition, 2012

WEB REFERENCES:

1. <http://web.stan5ford.edu/>
2. <https://in.zapmetasearch.com/>
3. <https://ads.google.com/>
4. <https://in.zapmetasearch.com/>
5. <https://www.izito.co.in/>

COURSE DESIGNER

Ms. T. Julie Mary- Assistant Professor, Department of Computer Applications

SEMESTER IV

**CORE COURSE – III (CC)
PROGRAMMING WITH JAVA**

Semeste
r: IV

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA4CC4	Programming with JAVA	Core	90	6	-	5

PREAMBLE

- Understand fundamentals of programming concepts, OOPs concepts and ability to write aJava program to solve specified problems.

COURSE OUTCOME:

On successful completion of the course, the students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain the fundamental concepts in Object Oriented Programming	K2
CO2	List basic programming skills in Java	K1
CO3	Illustrate package and exceptions with example	K2
CO4	Demonstrate the usage of threading and files	K2
CO5	Applet package and Database connectivity	K3

MAPPING WITH PROGRAM SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	M
CO2	M	M	M	M
CO3	S	M	M	M
CO4	S	M	M	M
CO5	S	S	S	M

S-Strong; M-Medium; L-Low

SYLLABUS

UNIT I: OOPS FUNDAMENTALS

(18 HOURS)

Fundamentals of Object-Oriented Programming: Basic Concepts of Object-Oriented Programming- Benefits and Applications of OOP. **Java Evolution:** Java Features – How Differs from C andC++ - Java and Internet – Java And World Wide Web – Web Browsers - Java Environment.

Overview of Java Language: Simple Java Program- More of Java- An Application with Two Classes- Java Program Structures, Tokens, Statements– Installing and Configuring Java- Implementing A Java Program – Java Virtual Machine – Comment Line Arguments – Programming Style.

UNIT II: CONSTANTS, VARIABLES, DATA TYPES, OPERATORS AND CONTROL STATEMENTS (18 HOURS)

Constants, Variables and Data Types: Constants- Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants- Type Casting- Getting Values of Variables. **Operators and Expressions- Decision Making and Branching -Decision Making and Looping** – While, Do, For Statements, Jump in Loops, Return Statements.

UNIT III: CLASSES, OBJECTS, METHODS, ARRAYS, STRINGS, VECTORS, INTERFACES AND PACKAGES (18 HOURS)

Classes, Objects and Methods: Defining A Class – Fields and Methods Declaration - Creating Objects – Accessing Class Members – Constructors – Method Overloading – Static Members – Nesting of Methods – Inheritance: Extending A Class – Overriding Methods – Final Variables, Methods and Classes – Finalizer Methods – Abstract Methods and Classes –Visibility Control. **Arrays, Strings and Vectors:** Creating Arrays – One- and Two-Dimensional Arrays-Strings – Vectors – Wrapper Classes – Enumerated Types. **Interfaces: Multiple Inheritance – Packages.**

UNIT IV: MULTITHREADED PROGRAMMING, FILES AND I/O STREAMS (18 HOURS)

Multithreaded Programming: Creating Threads – Extending the Thread Class – Stopping and Blocking Thread - Life Cycle of Thread-Using Thread Method - Thread Exception- Thread Priority-Synchronization – Implementing the Runnable Interface. **Managing Errors and Exceptions. Managing Input / Output Files in Java.**

UNIT V: APPLLET AND DATABASE CONNECTIVITY (18 HOURS)

Applet Programming: How Applets Differ from Applications - Preparing to Write Applets- Building Applet Code- Applet Life Cycle- Creating and Executable Applet – Designing A Web Page- Applet Tag-Adding Applet to HTML File-Running the Applet. **Java Database Connectivity:** Introduction – JDBC Architecture – Discussion with Example – Overview of JDBC Components.

TEXT

1. E. Balagurusamy, "Programming with JAVA", Tata McGraw-Hill Publishing Company Limited, New Delhi, 6th Edition, 2019.

REFERENCES

1. Ken Arnold gosling and Davis Holmen.”The JAVA Programming Language”,3rd Edition. Addison Wesley Publication.
2. S.Sagayaraj, R.Denis, P.Karthik and D.Gajalakshmi, “Java programming”, Universities Press,2017.
3. C.Muthu,”Programming with JAVA”, Second Edition, McGraw Hill Education (2008).
4. Schildt Herbert, “Java :The Complete Reference”, Tata McGraw-Hill,8th Edition, 2011.

WEB REFERENCES

1. <https://beginnersbook.com/>
2. https://www.tutorialspoint.com/java/java_tutorial.pdf
3. http://www.ntu.edu.sg/home/ehchua/programming/java/jdbc_basic.html - For JDBC connection.

COURSE DESIGNER

Ms.V.Yasodha, Assistant Professor, Department of Computer Applications.

CORE PRACTICAL – IV (CP)
PRACTICAL-IV –PROGRAMMING WITH JAVA

Semester: IV

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA4CC4P	Practical IV- Programming with Java	Core	45	-	3	2

PREAMBLE

- To impart practical training on Programming with Java.

COURSE OUTCOMES (CO)

- On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Recall basic arithmetic operations, command line arguments and arrays.	K1
CO2	Apply polymorphism, inheritance, interface and packages concepts.	K3
CO3	Implement all string operations.	K3
CO4	Use thread and exception handling concepts.	K3
CO5	Create applet programs	K5

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

	PSO1	PSO2	PSO3	PSO4
CO1	S	M	M	M
CO2	M	S	M	S
CO3	M	M	S	L
CO4	M	S	M	S
CO5	L	S	S	S

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. COMMAND LINE ARGUMENTS

Write a program to find the factorial of a given number using command line arguments.

2. ARRAYS

Write a program to sort list of elements in ascending and descending order.

3. STRING OPERATIONS

Write a program to implement all string operations.

4. POLYMORPHISM

Write program to implement constructor overloading.

5. INHERITANCE

Write a program to calculate employee pay slip using single inheritance.

6. INTERFACE

Write a program to implement the concept of interface.

7. PACKAGES

Write a program to find the student's percentage and grade using packages.

8. THREAD

Write a program to implement multithread concept and also assign priorities to them.

9. EXCEPTION HANDLING

Write a program to handle the exception using try and multiple catch statements
(NumberFormatException, ArithmeticException, ArrayIndexOutOfBoundsException).

10. APPLETS

Write a program to create a window with three check boxes called red, green, blue. The applet should change the colors according to the selection of the check box.

COURSE DESIGNER

Ms. P. Ranjani, Assistant Professor, Department of Computer Applications.

**ALLIED COURSE – III
ORGANIZATIONAL BEHAVIOUR**

Semester – IV	Organizational Behaviour	Hours/Week - 5	
Allied Course - III		Credits - 3	
Course Code - 19UCA4AC5 / 19UIT4AC5		Internal 25	External 75

Course Objective

- To help the students to develop cognizance of the importance of human behaviour.
- To enable students to describe how people behave under different conditions and understand why people behave as they do.
- To provide the students to analyse specific strategic human resources demands for future action.

Course Outcome

On the successful completion of the course, the students will be able to

CO No.	CO Statement	Knowledge Level
CO 1	Define the conceptual framework of organization behaviour	K1
CO2	Explain what leadership is and what makes an effective leader	K2
CO3	Identify the individual characteristics that influence work behaviour and organizational effectiveness.	K3
CO4	Analyse specific strategic human resources demands for future action	K4

Syllabus

Unit – I Fundamentals of Organisational Behaviour (15 Hours)

Definition – Nature – Scope and Goals of Organisation Behaviour – Fundamentals Concepts – Models – Foundation of Individual Behaviour – Human Behaviour - TQM – Managing Cultural Diversity – Total Employee Involvement.

Unit – II Personality, Perception & Motivation (15 Hours)

Definition – Determinants – Theories of Personality – Trait Theory: Big Five Model Type of Theory – Types of Personality. Perception: Meaning – Factors Affecting Perception – Motivation – Needs and Importance of Motivation – Process and Models of Motivation – Theories of Motivation: Maslow’s Need Hierarchy Theory, Mc Gregor’s Theory “X” and Theory “Y” and Herzberg’s Two factor theory of Motivation - Techniques of Motivation.

Unit – III Job Satisfaction & Job Stress (15 Hours)

Meaning – Factors – Importance of Satisfaction – Morale – Importance – Employee Attitude and Behaviour and Their Significance to Employee Productivity – Job Enrichment – Job Enlargement - Job Stress - Nature - Kinds of Stressors – Managing Stress – Job Frustration.

Unit – IV Groups and Conflict in Organisation (15 Hours)

Group: Meaning - Nature - Types – Group Dynamics – Cohesiveness – Group Norms. Conflict: Concept

– Process – Types – Resolution of Conflict – Sociometry – Power and Politics – Meaning – Distinction between Power and Politics – Organisational Politics – Types of Power.

Unit – V Learning & Leadership

(15 Hours)

Learning - Components of Learning, Theories of Learning - Leadership – Types – Theories – Trait – Managerial Grid - Fielders Contingency Theory – Organisational Climate – Organisational Effectiveness – Counselling and Guidance – Importance – Types of Counselling.

Text Book

.No.	Authors	Title	Publishers	of Publication
1.	L.M. Prasad	Organisational Behaviour	Sultan Chand & Sons	2008
2.	K. Aswathappa	Organisational Behaviour Text, Cases & Games	Himalaya Publications	2013

Reference

.No.	Authors	Title	Publishers	of Publication
1.	P. Subba Rao	Management & Organisational Behaviour	Himalaya Publications	2009
2.	S.S. Khanka	Organisational Behaviour Text & Cases	Sultan Chand & Co. Ltd	2008
3.	Fred Luthans	Organisational Behaviour Text & Cases	Mc Graw Hill	2014

Pedagogy

Lecture, Power Point Presentation, Assignment, Quiz, Google Classroom, Moodle, Seminar & Group Discussions.

Course Designer

Ms. D. Indumathi – Assistant Professor, Department of Commerce.

**SKILL BASED ELECTIVE-I
PRACTICAL – A - ANIMATION PRACTICALS**

SEMESTER-IV

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA4SBE1AP	Animation Practicals	SBE	30	–	2	2

PREAMBLE

- To impart training on Animation practicals

COURSE OUTCOMES (CO)

- On successful completion of the course, students will be able to

CONUMBER	COSTATEMENT	KNOWLEDGE LEVEL
CO1	Recall pen, brush tools in Photoshop	K1
CO2	Apply resolution, grayscale, black and white to an image	K3
CO3	Using layers, masking, rotation, overlapping of an image	K3
CO4	Creating custom colors, gradients, grouping, tweening	K5

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	M	S	S	S
CO3	M	S	S	S
CO4	S	S	S	S

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS PHOTOSHOP

1. BRUSH TOOL

Create a multicolor real life image using brush tool.

2. IMAGE SIZE, RESOLUTION AND COLOR CHANGE

a. Changing size, resolution and gray scale of an image.

b. Convert black and white image into color image.

3. IMAGE MODIFICATION

Cropping, rotating, overlapping, super imposing an image.

4. COMMERCIAL BROCHURE

Develop a commercial brochure with background tints.

5. LAYERS

Working with layers (creation, deletion, merge).

6. FILTERS AND MASKS

Applying masks and filtering on images.

FLASH

1. STROKES AND FILLS

Working with strokes and fills.

2. WORKING WITH COLOURS

Creating custom colors, gradients, grouping of objects.

3. CONVERSION

Converting text to shapes.

4. TWEENING

Applying tweening (motion, shape)

COURSE DESIGNER

Ms. P. Ranjani, Assistant Professor, Department of Computer Applications.

PRACTICAL – B - HTML 5 PRACTICALS

SEMESTER-IV

Course Code	Course Title	Category	Learning Hours	Theory Hours / Week	Practical Hours / Week	Credit
19UCA4SBE1BP	HTML 5 Practicals	SBE	30	-	2	2

PREAMBLE

To know the basic concepts of HTML 5.

COURSE OUTCOMES (CO)

On successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand basic HTML tags	K1
CO2	Create a HTML page using keygen, meter and menu Elements	K5
CO3	Apply audio components and datalist in HTML 5	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES (PSO)

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	M	M	M	M
CO3	M	S	S	M

S- Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. BASIC ELEMENTS OF HTML

- Design a webpage using SCRIPT & NOSCRIPT tags using HEADER & FOOTER
- Design a webpage using Citations, Quotations & Definitions

2. PHRASE TAGS

- Create a web page using Canvas element in HTML.
- Design a webpage by applying Keygen element of HTML.

3. PRESENTATION TAGS

Create a web page using Background image & color properties

4. LIST PROPERTY

Design a webpage using list-style-type property.

5. LINKS AND IMAGES

a. Create a web page using HYPERLINK

b. Create a web page using IMAGES.

6. TABLES

Design a webpage using Table elements

7. FORMS

Design a webpage by applying Form elements of HTML.

8. FRAMES

Create a web page using frames

9. JAVASCRIPT

Write JAVASCRIPT to display the result of any calculation, using HTML output element.

COURSE DESIGNER

Ms.Lakshna Arun, Assistant Professor, Department of Computer Applications

SEMESTER V

CORE COURSE – V (CC)
WEB PROGRAMMING WITH PHP

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5CC5	Web Programming with PHP	Core	75	5	-	5

PREAMBLE

- To understand the fundamentals of programming such as variables, operators, flow control and to learn website creation using PHP.
- To understand the concepts of designing simple web application using PHP with MySQL.

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Describe the basic concepts of PHP	K2
CO2	Implement functions and arrays in PHP	K3
CO3	Apply OOPS concepts in PHP	K3
CO4	Demonstrate the concepts of session, cookies and FTP	K2
CO5	Execute MySQL queries using PHP	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	M
CO2	M	M	M	M
CO3	S	S	M	M
CO4	S	S	M	M
CO5	S	S	S	M

S-Strong; M-Medium; L-Low

SYLLABUS:

UNIT I: Essential PHP

(15 HOURS)

Essential PHP:Creating your Development Environment- Creating a First PHP Page-Mixing HTML and PHP - Printing Some Text- Printing Some HTML- More Echo Power- Using PHP “Here” Documents- Adding Comments to PHP - Variables - Constants - Data Types .Operators and Flow Control.

UNIT II: PHP Basics

(15 HOURS)

Strings and Arrays - Creating Functions- Reading Data in Web Pages: Setting Up Web Pages to Communicate with PHP - Handling Text Fields and Text Areas - Handling Check Boxes and Radio Buttons - Handling List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads and Buttons.

UNIT III: OOPS Concepts

(15 HOURS)

Object-Oriented Programming: Creating Classes, Objects - Setting Access to Properties and Methods - Using Constructors and Destructors - Inheritance - Overriding, Overloading Methods, Autoloading Classes. Advanced Object-Oriented Programming: Creating Static Methods, Abstract Classes, Interfaces and Class Constants, Supporting Object Iteration - Using Final Keyword - Cloning Objects- Reflection.

UNIT IV: File Handling

(15 HOURS)

PHP Browser-Handling Power -File Handling-Cookies and FTP: Setting, Reading, Deleting Cookies - Working with FTP - Downloading, Uploading, Deleting a File with FTP - Creating and Removing Directories with FTP - Working with E-mail. Session Handlers:Session Handling - Configuration Directives - Working with Sessions - Practical Session-Handling Examples - Creating Custom Session Handlers.

UNIT V: MySQL using PHP

(15 HOURS)

Introducing MySQL: Key Features of MySQL - Prominent MySQL Users.Working with Databases:Creating a MySQL Database - Creating a New Table - Putting Data into the New Database - Accessing the Database in PHP -Update Data into the Database- Insert Data into the Database - Delete Data from Database. Drawing Images on the Server.

TEXT:

1. Steven Holzner, “The Complete Reference PHP”, Tata McGraw Hill Pvt. Ltd., 2012.
2. Frank M. Kromann, “Beginning PHP and MySQL”, Novice to Professional, Fifth Edition, 2018.(Chapters 3, 17, 22)

REFERENCES:

1. Rasmus Lerdorf, Kevin Tatroe, Peter MacIntyre, “Programming PHP”, Third Edition, O’Reilly, 2013.
2. Luke Welling, Laura Thomson, “PHP and MySQL Web Development”, Fifth Edition, Pearson India Education Services Pvt. Ltd., 2017.

WEB REFERENCES:

1. <https://www.php.net/manual/en/index.php>
2. www.tutorialspoint.com/php/php_tutorial.pdf

COURSE DESIGNER

Ms.R.Brendha, AssociateProfessor, Department of Computer Applications.

CORE COURSE – V (CP)
PRACTICAL V –PHP WITH MySQL

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5CC5P	Practical V- PHP With MySQL	Core	60		4	3

PREAMBLE:

- To impart practical training on Programming with PHP.

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Apply HTML tags and PHP coding to design an application form	K3
CO2	Implement form validation using PHP	K3
CO3	Create session for college office bearers election	K3
CO4	Create and manipulate database using MySQL	K5
CO5	Develop an application by their own	K5

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	M	M	M
CO2	S	M	M	M
CO3	S	S	L	L
CO4	S	S	M	M
CO5	S	S	S	S

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

- Using HTML tags, create a college application form. (Note: Application form should contain the following fields Name, Father's Name, Date of Birth, Gender, Email-Address, Mobile Number, Address and Course to be Applied)
- Apply PHP coding to print the data of the college application form.
- Validate the application form using validator functions and display the error messages.

4. Design a HTML form to get a student's semester mark details and calculate the total, average, grade, result according to the marks.
5. Create a PHP page for the college union bearers' election using sessions.
6. Database in PHP
 - a. Get the student details, using application form insert into the database.
 - b. Design a HTML page for selecting subjects for examination and insert into database.
 - c. Based on student's selection of subjects generate hall ticket with examination date.
7. Create your own PHP applications (like Employee Management System, Library Management System, Student Management System)

COURSE DESIGNERS:

Ms. V. InfineSinduja, Assistant Professor, Department of Computer Applications.

Ms. A. Jabeen , Assistant Professor, Department of Computer Applications.

CORE COURSE – VI (CC)

OPERATING SYSTEMS

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5CC6	Operating Systems	Core	75	5		5

PREAMBLE:

- To understand the concept of Process Management, Synchronization, Scheduling, Deadlock, Memory Management and File Systems in Operating Systems

COURSE OUTCOME:

On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	State the types of Operating System and its Structure	K1
CO2	Describe Process Management & Synchronization	K1
CO3	Explain various Scheduling and deadlock	K2
CO4	Discuss Memory Management & Mass Storage	K2
CO5	Illustrate File Systems	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	M	M	M
CO2	S	S	M	M
CO3	S	S	L	L
CO4	S	S	S	L
CO5	S	S	S	S

S – Strong; M – Medium; L - Low

SYLLABUS:

UNIT I: Introduction to Operating System

(15 HOURS)

Introduction: Objectives and Functions – Different Views of an OS – Evolution of Operating Systems - Types of Operating System – Comparison between different Operating Systems –Computer System Organization – Computer System Architecture – Operating System Operations - Operating System Structures.

UNIT II: Process Management & Synchronization

(15 HOURS)

Process Management: Introduction – Process Concept – Process Scheduling - Operations on Process – Cooperating Processes – Interprocess Communication.**Process Synchronization:** Principles of Concurrency – Precedence Graph – Critical regions – Synchronization: Software Approaches - Semaphores.

UNIT III: Scheduling & Deadlock

(15 HOURS)

CPU Scheduling: Introduction – Scheduling Concepts – Scheduling Criteria - Scheduling Algorithm – Multiprocessor Scheduling – Real-time Scheduling – Algorithm Evaluation – Thread Scheduling. **Deadlock:** System Model – Deadlock Characterization – Method for Handling Deadlock – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Deadlock Recovery.

UNIT IV: Memory Management, I/O Systems & Mass Storage

(15 HOURS)

Memory Management Strategies: Background – Contiguous Memory Allocation – Non- Contiguous Memory Allocation – Swapping – Overlays.**Virtual Memory:** Demand Paging – Page Replacement– Thrashing. **I/O Systems:** Introduction – I/O techniques – Application I/O Interface – Kernel I/O Sub systems. **Mass Storage:** Introduction – Disk Structure- Disk Scheduling.

UNIT V: File Systems

(15 HOURS)

File Systems: Introduction – Basic concept – Directories – File System Mounting – Record Blocking- File Sharing – Protection.- **Implementation of File System:** File System Structure – File System Implementation – Allocation Methods – Implementing Directories – Shared Files – Free Space Management – Recovery – Log Structured File System.

TEXT:

1. Rohit Khurana, “Operating Systems”, Vikas Publishing House Pvt.Ltd, New Delhi, 2nd Edition, 2018.

REFERENCES:

1. “Abraham Silberschatz, Peter Baer Galvin, Greg Gagne”, “Operating System concepts”, John Wiley & Sons, Inc, New Delhi, 6th Edition, 2002.
2. “Ann McIverMcHoes, Ida M.Flynn”, “Understanding Operating Systems”,Cengage Learning, New Delhi, 6th Edition, 2018.

WEB REFERENCES:

1. https://www.tutorialspoint.com/operating_system/
2. <https://www.geeksforgeeks.org/operating-systems/>
3. http://www.sncwgs.ac.in/wp-content/uploads/2015/11/operating_system_tutorial.pdf

COURSE DESIGNER

Ms.P.Ranjani, Assistant Professor, Department of Computer Applications.

**CORE COURSE – VII (CC)
SOFTWARE ENGINEERING**

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5CC7	Software Engineering	Core	75	5	-	5

PREAMBLE:

- To provide knowledge of the various phases of Software Engineering Process

COURSE OUTCOME:

On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Describe the basics of Software Engineering	K1
CO2	State the concepts of design and Architecture Engineering	K1
CO3	Explain object oriented analysis and design concepts	K2
CO4	Demonstrate the design and coding of a software	K2
CO5	Make use of various types of software testing	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	S
CO2	S	L	S	S
CO3	M	S	S	S
CO4	S	S	S	L
CO5	S	S	S	M

S – Strong; M – Medium; L – Low

SYLLABUS:

Unit I: Introduction to Software Engineering

(15 HOURS)

Software Engineering-Introduction: Introduction to Software Engineering -Software Process - Software Process Models -Software product -**Requirements EngineeringPrinciples:** Introduction - Requirements Engineering - Importance of Requirements -Types of Requirements.

Unit II: Analysis & Design

(15 HOURS)

Requirement Analysis Modeling: Analysis Modeling Approaches -Structured Analysis - Object Oriented Analysis - **Design and Architectural Engineering:** Design Process and Concepts - Basic Issues in Software Design - Characteristics of Good Design - Software Design and Software Engineering - Function Oriented System vs Object Oriented System - Modularity, Cohesion, Coupling, Layering - Real Time Software Design -Design Models -Design Documentation.

Unit III: Object Oriented Concepts

(15 HOURS)

Object Oriented Concepts: Introduction - Fundamental Parts of Object-Oriented Approach -Data Hiding and Class Hierarchy Creation -Relationships -Role of UML in OO Design -Design Patterns - Frameworks – **Object Oriented Analysis and Design:** Object Oriented Analysis -Object Oriented Design.

Unit IV: Software Design & Coding

(15 HOURS)

User Interface Design: Concepts of User Interface - Elements of User Interface -Designing the User Interface -User Interface Evaluation -Golden Rules of User Interface Design -User Interface Models –Usability- **Software Coding:** Introduction – Programming Principles –Programming Guidelines – Coding Conventions – Key Concepts in Software Coding.

Unit V: Software Testing & Maintenance

(15 HOURS)

Introduction to Software Testing: Introduction – Psychology of Testing – Software Testing Scope - Software Testing Objectives - Strategic Approach to Software Testing- Types of Software Testing - **Software Maintenance:** Introduction - Maintenance Activities - Maintenance Process - Maintenance Cost - Software Evolution - Reverse Engineering - Re-engineering - Re-structuring - Maintenance Strategies - Issues in Software Maintenance.

TEXT:

1. Chandramouli Subramanian, Saikat Dutt, Chandramouli Seetharaman, B.G.Geetha “Software Engineering”, Pearson Publications, 2015.

REFERENCES:

1. JibiteshMishra,”Software Engineering”, Pearson Education, 2011
2. Richard E. Fairley, “Software Engineering Concepts”, Tata McGraw-Hill Publishing Company Ltd. 2001
3. Roger S.Pressman, Bruce R.Maxim, “Software Engineering: A Practitioner's Approach, Tata McGraw-Hill Publishing Company Ltd., 2014.

WEB REFERENCES:

1. https://www.tutorialspoint.com/software_engineering/
2. <https://www.geeksforgeeks.org/software-engineering/>
3. <https://www.slideshare.net/pashadon143/se-46394097/>

COURSE DESIGNER

Ms.A.Jabeen, Assistant Professor, Department of Computer Applications.

**MAJOR BASED ELECTIVE – I (MBE)
CLOUD COMPUTING**

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5MBE1A	Cloud Computing	MBE-I	90	6	-	5

PREAMBLE

- To understand the concepts in Cloud Computing and its Applications

COURSE OUTCOME:

On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	State the Architecture of Cloud Computing	K1
CO2	Explain the Virtualization of Cloud Computing	K2
CO3	Explain the Data storage in Cloud	K2
CO4	Discuss the Applications of Cloud Computing	K2
CO5	Illustrate the Risks & Data Security	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	S
CO2	S	S	S	S
CO3	M	S	M	S
CO4	S	S	S	M
CO5	M	S	M	M

S-Strong; M-Medium; L-Low

SYLLABUS:

UNIT I: Cloud Computing & Architecture

(18 HOURS)

Cloud Computing Foundation: Cloud Computing Basics-History of Cloud Computing. **Move to Cloud Computing:** Pros and Cons of Cloud Computing-Technologies in Cloud Computing. **Types of Cloud:** Public and Private Cloud-Cloud Infrastructure. Cloud Application Architecture. **Working of Cloud Computing:** Cloud Service Models-Cloud Deployment Models-**Cloud Computing and Services:** Pros and Cons.**Cloud Computing Architecture:** Cloud Computing Technology-Cloud Lifecycle Model- Role of Cloud Modeling and Architecture-Cloud Architecture.

UNIT II: Virtualization

(18 HOURS)

Foundations: Definition of Virtualization-Adopting Virtualization-Types of Virtualization-Virtualization Architecture and Software-Virtualization Application-Pitfalls of Virtualization. **Grid, Cloud and virtualization:** Virtualization in Grid-Virtualization in Cloud-Virtualization and Cloud Security. **Virtualization and Cloud Computing:** Anatomy of Cloud Infrastructure-Virtual Infrastructures- CPU Virtualization-Network and Storage Virtualization.

UNIT III: Data Storage and Cloud Computing

(18 HOURS)

Data Storage: Introduction to Enterprise Data Storage–Data Storage Management-File Systems-Cloud Data Stores –Using Grids for Data Storage. **Cloud Storage:** Cloud Storage Introduction-Overview of Cloud Storage-Data management for Cloud Storage-Provisioning Cloud Storage-Data-intensive Technologies for Cloud Computing, **Cloud Computing Elements:** The Cloud-Value of Cloud Computing- Cloud Do's and Don'ts-Cloud Computing-Legal Implication-Overview of Amazon Web Services. **Understanding Services and Applications by Type:** Web based Application-Web Services- Infrastructure Services-On demand Computing-Web Application Framework.

UNIT IV: Cloud Services & Applications

(18 HOURS)

Cloud Services: Cloud Types and Services-Software as a Service- Platform as a Service- Infrastructure as a Service-Other Cloud Services. **Cloud Applications:** Microsoft Cloud Services. **Google Cloud Applications:** Google Applications Utilizing Cloud-Google App Engine-**Amazon Cloud Services:** Understanding Amazon Web Components and Services-Elastic Compute Cloud (EC2)-Amazon Storage System-Amazon Database Services.

UNIT V: Cloud Computing and Security

(18 HOURS)

Risk in Cloud Computing: Introduction- Risk Management-Cloud Impact-Enterprise Wide Risk Management- Types of Risks in Cloud Computing. **Data Security in Cloud:** Introduction-Current State- Homo Sapiens and Digital Information-Content Level Security (CLS). **Cloud Security Services:** Objectives- Confidentiality, Integrity and Availability-Security Authorization Challenges in the Cloud- Secure Cloud Software Requirements-Secure Cloud Software Testing-Future Cloud.

TEXT:

1. A.Srinivasan, J.Suresh, “Cloud Computing: A practical approach for learning and implementation”, Pearson India Publications,2014

REFERENCES:

1. Kai Hwang Geoffrey Fox Jack J.Dongarra ,“Distributed Cloud Computing: From Parallel Processing To Internet of Things“ ,Elsevier,2012
2. Judith S.Hurwitz,Daniel Kirsch, “Cloud Computing for Dummies”, WILEY, 2020
3. Barrie Sosinsky, “Cloud Computing Bible”,WILEY, 2011

WEB REFERENCES:

1. https://en.wikipedia.org/wiki/Cloud_computing
2. https://link.springer.com/chapter/10.1007/978-3-030-34957-8_7

COURSE DESIGNER

MsLakshnaArun, Assistant Professor, Department of Computer Applications.

Major Based Elective - I (MBE)
INTRODUCTION TO DATA MINING AND WAREHOUSING
SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5MBE1B	Introduction to Data Mining And Warehousing	MBE I	75	5	-	5

PREAMBLE

- To understand concepts of data mining and ware housing.

COURSE OUTCOME:

On the successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand the concept of data mining and data warehousing	K1
CO2	Know the various data mining techniques such as association rule mining	K2
CO3	Describe the Characteristics of web and web Mining	K3
CO4	Discuss the Knowledge on multi dimensional data and OLAP operations	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	M
CO2	M	M	M	M
CO3	M	S	S	M

S– Strong; M–Medium; L -Low

SYLLABUS

UNIT I: Introduction

(18 HOURS)

Data Mining Definition - Application - Data Mining Techniques - Data Mining Case Studies: Aviation, Astrology, Mall Order - Future of Data Mining - Data Mining Software. Association Rule Mining: Introduction - Basics – Apriori Algorithm.

UNIT II: Classification

(18 HOURS)

Introduction- Decision tree -Building a Decision Tree - The Tree Induction Algorithm - Split Algorithm based on Information Theory - Over fitting and Pruning - Decision Tree Rules - Naive Bayes Method - Estimation of Predictive Accuracy of Classification Methods.

UNIT III: Cluster Analysis**(18 HOURS)**

Cluster Analysis - Desired Features of Cluster Analysis - Types of Data - Computing Distance - Types of Cluster Analysis Methods – Partition Methods: K-Means Method - Hierarchical Methods : Distance between clusters - Agglomerative Method - Divisive Hierarchical Method - Density based Methods - Dealing With Large Databases .

UNIT IV: Web Data Mining**(18 HOURS)**

Introduction - Web Terminology and Characteristics - Web Content Mining - Web Usage Mining - Web Structure Mining - Search Engines: Search Engines Functionality Search Engines Architecture -Ranking Of Web Pages.

UNIT V: Data Warehousing**(18 HOURS)**

Introduction - Data Warehouses - Data Warehousing Design - Guidelines for Data Warehousing Implementation - Data Warehouse Metadata. Online Analytical Processing (OLAP): Introduction - Characteristics of OLAP System: Multidimensional View and Data Cube , OLAP Cube Operations.

TEXT:

1. G.K. Gupta “Introduction To Data Mining With Case Studies” , PHI, 2014

REFERENCES:

1. Jiawei Han, MichelineKamber, Jian Pei “Data Mining: Concepts and Techniques” Morgan Kaufman Publishers, Third Edition, 2012
2. C.S.R. Prabhu“ Data Warehousing: Concepts, Techniques, Products and Application” PHI Learning Private Ltd. Second Edition, 2008

WEB REFERENCES:

1. <https://www.tutorialride.com/data-mining/data-mining-tutorial.htm>
2. https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm

COURSE DESIGNER

Ms.T.Juliamary , Assistant Professor, Department of Computer Applications.

**MAJOR BASED ELECTIVE – I (MBE)
ARTIFICIAL INTELLIGENCE**

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA5MBE1C	Artificial Intelligence	MBE I	75	5	-	5

PREAMBLE

To foster the development and understanding of Artificial Intelligence and its applications worldwide.

COURSE OUTCOMES:

On successful completion of the Artificial Intelligence course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain the AI problem Solving Techniques	K2
CO2	Describe Several General Purpose Search Techniques	K3
CO3	Explain Various Heuristic Search Algorithms	K2
CO4	Discuss the Predicate Logic and Relationships for Knowledge Representation	K3
CO5	Apply the Use of Rules to Encode Knowledge	K2

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

Cos	PSO1	PSO2	PSO3	PSO4
CO1	M	M	M	S
CO2	S	S	M	S
CO3	M	S	S	S
CO4	S	S	M	S

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I: Problems and Search

(18 Hours)

What is Artificial Intelligence?:- The AI Problems-What is an AI Technique?-**Problems, Problem Spaces and Search:**Defining the Problem as State Space Search- Production Systems - Control Strategies – Algorithm : Breadth-First Search – Algorithm : Depth-First Search – Advantages of Depth- First Search and Breadth-First Search.

UNIT II: Heuristic Search Techniques**(18 Hours)**

Generate-and-Test –Algorithm: Generate-and-Test - Hill Climbing –Simple Hill Climbing – Algorithm: Simple Hill climbing - Steepest-Ascent Hill Climbing – Algorithm: Steepest-Ascent Hill Climbing - Best-first Search – OR-Graphs – Algorithm: Best-First Search -The A* Algorithm.

UNIT III: Heuristic Search Techniques**(18 Hours)**

Problem Reduction – AND-OR Graphs – Algorithm- Problem Reduction - The AO*Algorithm – Algorithm: AO* - Constraint Satisfaction – Algorithm: Constraint Satisfaction -Means-Ends- Analysis.

UNIT IV: Knowledge Representation**(18Hours)**

Knowledge Representation Issues: Representations and mappings -Approaches to Knowledge Representation. **Using Predicate Logic:** Representing Simple Facts in Logic- Representing Instance and ISA Relationships - Computable Functions and Predicates.

UNIT V: Representing knowledge using Rules**(18 Hours)**

Procedural Versus Declarative Knowledge – Logic Programming – Forward Versus Backward Reasoning. **Symbolic Reasoning Under Uncertainty:** Introduction to Non-monotonic Reasoning - Logics for Non-monotonic Reasoning.

TEXT:

1. Elaine Rich, Kevin Knight and Shivashankar B Nair, “Artificial Intelligence”, Tata McGraw-Hill companies, Third Edition, Reprint 2017.

REFERENCES:

1. Stuart Russel and Peter Norvig, “Artificial Intelligence- A Modern Approach”, Pearson Education, 2nd Edition, 2020.
2. Saroj Kaushik, “Artificial Intelligence”, Cengage Learning India, 2011.

WEB REFERENCES:

1. www.eeCIS.udel.edu
2. <https://courses.cs.washington.edu>
3. www.cs.ukzn.ac.za
4. www.tutorialspoint.com/pdf/artificial_intelligence_expert_systems.pdf

COURSE DESIGNER

A. Anandhavalli, Assistant Professor, Department of Computer Applications.

SKILL BASED ELECTIVE – II (SBE)

PRACTICAL - PC Packages

Semester: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5SBE2AP	PC Packages	SBE	30	-	2	2

PREAMBLE:

- To understand concepts of PC Package Programming.

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Creating documents using template in MS – word	K1
CO2	Design a worksheet in MS- Excel	K2
CO3	Demonstrate usage of slides in MS – PowerPoint	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	S
CO2	S	S	M	M
CO3	M	M	S	S
CO4	M	M	M	L

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS MS – WORD

- Text Manipulation – Change the font type and style, alignment of text and underline the text
- Prepare a document with Bullets, Footers and Headers
- Prepare a document in newspaper format
- Table – Creation, insertion, deletion (Columns and rows)
 - Create a Mark Sheet using table and find out total of all marks for each student
- Picture insertion and alignment: - Prepare a Greeting Card

6. Creation of documents using templates
 - a. Prepare a letter using any template
 - b. Prepare a Biodata using any kind of templates
7. Mail Merge: - Prepare Convocation invitation to be sent to specific addresses in the data source.

MS EXCEL

8. MS-Excel-Introduction: - Worksheet & Work book preparation
 - a. Entering, Editing and Deleting Text, Numbers, Dates
 - b. Moving and Copying data
 - c. Inserting, Deleting and Hiding Rows & Columns
 - d. Inserting, Deleting, Moving and Copying Sheets
 - e. Merging of cells
9. Implement built-in functions such as date, date & time, Text functions
10. Data sorting – Ascending and Descending (both numbers and alphabets)
11. Prepare worksheet
 - a. For Mark list of a class with a chart (any type)
 - b. For electricity bill
12. Implement Data filtering in the mark list
13. Implement the concept of conditional formatting and freeze panes.

MS POWER POINT

14. MS-PowerPoint: - Inserting clip and pictures
 1. Create a slide show presentation for a seminar chooses your own topics.
 - a. Enter the text in outline view
 - b. Create non-bulleted and bulleted body text
 - c. Apply the appropriate text attributes
15. Presentation using wizards -Usage of design templates: - Creation of a slide show presentation using different presentation template and different transition effect for each slide. Use different text attributes in each slide.

COURSE DESIGNER

Ms, T. Julie Mary, Assistant Professor, Department of Computer Applications.

SKILL BASED ELECTIVE - II

PRACTICAL –COREL DRAW

Semester: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5SBE2BP	COREL DRAW	SBE	30	-	2	2

PREAMBLE

- To make students familiar about CorelDraw Tools for designing a webpage.

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Define usage of Corel Draw X7	K1
CO2	Describe formatting tools in CorelDraw	K2
CO3	Creating effective document	K3
CO4	Demonstrating all options in shapes tool	K3
CO5	Developing a sample webpage	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	S
CO2	S	S	M	M
CO3	M	M	S	S
CO4	M	M	M	L

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

Download & Install Corel Draw X7

1. Creating new document, adding new pages and resizing the documents using simple tools in Corel Draw X7.
2. Design a page with shapes and colours using tools in toolbox
3. Formatting & decorating text shapes using Smear tool.
4. Import an image and alter it by applying crop tool
5. Create a document with all the options in Draw tool.
6. Design a Brochure design using Artistic tool & text tool
7. Demonstrate Shadow/Contour/Blend in shapes & text.
8. Create a Poster using Transparency tool & text tool.

COURSE DESIGNER

Ms. M.Ellakkiya, Assistant Professor, Department of Computer Applications.

SKILL BASED ELECTIVE – III (SBE)
PRACTICAL - MOBILE APPLICATIONS DEVELOPMENT
SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5SBE3AP	Practical -Mobile Applications Development	SBE	30	-	2	2

PREAMBLE

- To understand the android studio tools and SDK for developing android applications.

COURSE OUTCOMES:

On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Illustrate the android application development tools with installation.	K2
CO2	Develop user interfaces for the android platform.	K3
CO3	Apply Java programming concepts to android application development.	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	S	M	M	M
CO3	M	M	L	L

S – Strong; M – Medium; L - Low

LIST OF PRACTICALS

- Develop a “Hello World” application.
- Develop an application that uses GUI components (Font and Colors.).
- Develop a login module(Check username and password) using activity and Intent.
- Develop a native calculator application using activities and Fragments.
- Develop an application that draws basic graphical primitives on the screen.
- Develop an application that makes use of databases.
- Develop an application that creates an alarm clock.

COURSE DESIGNER

Ms.V.Yasodha, Assistant Professor, Department of Computer Applications.

**SKILL BASED ELECTIVE– III (SBE)
PRACTICAL - MULTIMEDIA SYSTEMS**

SEMESTER: V

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA5SBE3BP	Practical - Multimedia Systems	SBE	30	2	-	2

PREAMBLE

- Understand the use of various components of multimedia systems.

COURSE OUTCOME:

On successful completion of the course, students will be able to

CONUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand and apply the basic concepts of Multimedia	K1
CO2	Demonstrate the Animation with Music	K2
CO3	Develop logo using images and graphics	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	S
CO2	S	S	S	S
CO3	S	S	M	S

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. Registration of a user in www.Renderforest.com
2. Design a Multicolor Blast logo and Igniting logo Reveal
3. Create your own animation with music
4. Create mockup for any business with tag line
5. Develop a College website using the tools of renderforest
6. Create a video for teacher's day celebration
7. Design flyers and posters for graduation day

COURSE DESIGNERS:

Ms.M.Ellakkiya, Assistant Professor, Department of Computer Applications

Ms.K.Akila, Assistant Professor, Department of ComputerApplications

SEMESTER VI

CORE COURSE VIII– (CC)
COMPUTER NETWORKS

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA6CC8	Computer Networks	Core	90	6	-	5

PREAMBLE:

- To understand the design and organization of computer networks

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Describe the design and issues of the layers	K1
CO2	State the concepts of physical layer and data link layer	K1
CO3	Explain the various routing algorithms	K2
CO4	Demonstrate the protocols of transport layers	K2
CO5	Explain the function of application layer	K2

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	S
CO2	S	L	S	S
CO3	M	S	S	S
CO4	S	S	S	L
CO5	S	S	S	M

S – Strong; M – Medium; L – Low

SYLLABUS:

UNIT I: Introduction to Network Layers and Reference Models **(18 HOURS)**

Introduction – Uses of Computer Networks – Network Hardware – Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection Oriented and Connectionless Services – Service Primitives **Reference models:** The OSI Reference Model – TCP/IP Reference Model.

UNIT II: Physical layer and Data link layer**(18 HOURS)**

The Physical Layer: Guided Transmission Media – Public Switched Telephone Network – Structure of Telephone System – Trunks and Multiplexing – Switching - **The Data link Layer:** Data link layer Design Issues – Error Detection and Correction – Stop and Wait Protocol - Sliding Window Protocol.

UNIT III: Network Layer and Routing Algorithms**(18 HOURS)**

The Network Layer: The Network Layer Design Issues – **Routing Algorithms:** The Optimality Principle – Shortest Path Routing – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcast Routing – Congestion Control Algorithms: General Principles of Congestion Control – Congestion Prevention Policies.

UNIT IV: Transport layer and Protocols**(18 HOURS)**

The Transport Layer: The Transport Service – Elements of Transport Protocols – **Internet Transport Protocols:** Introduction to UDP – RPC – TCP: TCP Service Model – TCP Protocol – TCP Segment Header.

UNIT V: Application Layer**(18 HOURS)**

The Application Layer: The DNS Name Space – E-mail: Architecture and Services – Message Formats.

TEXT:

1. Andrew S. Tanenbaum, David J. Wetherall “Computer Networks”, Pearson Prentice Hall, Fifth Edition, 2019.

REFERENCES:

1. Behrouz A. Forouzan, “Data Communications and Networking”, Tata McGraw-Hill, Fifth Edition, 2017.
2. William Stallings, “Data and Computer Communication”, PHI, Fifth Edition, 2008.

WEB REFERENCES:

1. <https://www.geeksforgeeks.org/layers-of-osi-model/>
2. <https://www.geeksforgeeks.org/classification-of-routing-algorithms/>
3. https://www.tutorialspoint.com/communication_technologies/

COURSE DESIGNER

Ms.A. Jabeen, Assistant Professor, Department of Computer Applications.

CORE COURSE IX– (CC)

INTERNET OF THINGS

Semester: VI

CourseCode	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA6CC9	Internet of Things	Core	90	6	-	5

PREAMBLE

- To understand the concepts of Internet of Things and technologies involved in the connected devices

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain IoT enabling Technologies.	K2
CO2	Analyze applications of IoT in real time scenario	K4
CO3	Design a portable IoT using Raspberry pi	K5
CO4	Expalin Data Analytics for IoT.	K2
CO5	Illustrate Tools in IoT	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	M	S	M	M
CO3	S	M	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S – Strong; M – Medium; L – Low

SYLLABUS

UNIT I: Internet of Things & Design Principles

(18 HOURS)

Internet of Things an Overview: Internet of Things-IoT conceptual framework-IoT architectural view-Technology behind IoT-Sources of IoT –M2M communication-Examples of IoT. **Design Principles for connected devices:** Introduction –IoT/M2M Systems layers & designs standardisation-communication technologies-data enrichment, data consolidation & device management at gateway-ease of designing and affordability.

UNIT II : Design & Web Connectivity Principles

(18 HOURS)

Design Principles For Web Connectivity: Introduction – Web Communication Protocol for Connected Devices- Message Communication Protocol for Connected Devices-Web Connectivity for Connected Devices Network Using Gateway, SOAP,REST,HTTP Restful & Websockets .**Internet Connectivity Principles:** Introduction-Internet Connectivity-Internet Based Communication-IP Addressing in the IoT-Media Access Control-Application Layer Protocols:HTTP,HTTPS-FTP-Telnet and Others.

UNIT III: Data Acquiring and Data Collection

(18 HOURS)

Data Acquiring, Organizing, Processing and Analytics: Introduction-Data Acquiring and Storage-Organizing the Data-Transactions ,Business Process, Integrations & Enterprise Distance-Analytics-Knowledge Acquiring, Managing and Storing Processors .**Data Collection ,Storage & Computing Using Cloud Platform:** Introduction-Cloud Computing Paradigm for Data Collection ,Storage and Computing-Everything as a Service and Cloud Service Models-IoT Cloud based Services Using the Xively, Nimbits and Other Platforms.

UNIT IV: Sensors and Embedded Devices

(18 HOURS)

Sensors, Participatory Sensing, RFIDs and Wireless Sensor Networks: Introduction-Sensor Technology- Participating Sensing, Industrial IoT and Automotive IoT-Actuators-Sensor Data Communication Protocols-Radio Frequency Identification Technology-Wireless Sensor Network Technology. **Prototyping the Embedded Devices for IoT and M2M:** Introduction-Embedded Computing Basics –Embedded Platforms for Prototyping-Things always connected to the Internet/Cloud.

UNIT V: IoT Security

(18 HOURS)

IoT Privacy, Security and Vulnerabilities Solutions:Introduction-Vulnerabilities,Security Requirements and Thread Analysis-Use Cases And Misuse Cases-IoT Security Tomography and Layered Attacker Models – Identity Management and Establishment ,Access Control and Secured Message Communication –Security Models, Profiles andProtocols for IoT.

TEXT:

1. Raj Kamal, “Internet of Things Architecture and Design Principles”, McGraw Hill Education (India) Private Limited, 2017.

REFERENCES:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossette,Robert Barton, Jerome Henry, “IoT Fundamentals,Networking Technologies, Protocols and Use cases forInternet of Things”, Cisco Press, 2017.
2. Olivier Hersent, David Boswarthick, Omar Elloumi, “The Internet of Things – Key applications and Protocols”,Wiley, 2012.

WEB REFERENCES:

1. <https://www.tutorialspoint.com/>
2. <https://www.guru99.com/>
3. <https://www.pythonforbeginners.com/>

COURSE DESIGNER

Ms.Lakshna Arun, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE- II
PYTHON PROGRAMMING

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA6MBE2A	Python Programming	MBE II	90	6	-	5

PREAMBLE

- To understand concepts of Python programming language.

COURSE OUTCOME :

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Understand Python's core data types while writing new programs	K1
CO2	Demonstrate different decision making statements	K2
CO3	Apply the knowledge of file concepts	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	M
CO2	M	M	M	M
CO3	M	S	S	M

S- Strong; M-Medium; L-Low

SYLLABUS

UNIT I: Basics of Python Programming

(18 HOURS)

Introduction: Python Character Set-Token-Python Core Data Type- The print() Function- Assigning value to a variable-Multiple Assignments- Writing Simple Programs in Python- The input() Function- The eval() Function- Formatting Number and Strings- Python Inbuilt Functions

UNIT II: Operators , Expressions, Decision and Loop Control Statements

(18 HOURS)

Introduction: Operators and Expressions- Arithmetic Operators- Operator Precedence and Associativity- Bitwise Operator- Introduction: Boolean Operators- Using Numbers with Boolean Operators- Using String with Boolean Operators- Boolean Expressions and Relational Operators-Decision Making Statements- Conditional Expressions-Introduction: While Loop-The range() Function-The For Loop-Nested Loops-The break Statement-The continue Statement

UNIT III: Functions, Strings and Lists

(18 HOURS)

Introduction: Syntax and Basics of a Function-Use of a Function-Parameters and Arguments in a Function- The Local and Global Scope of a Variable-The return Statement-Recursive Functions-The Lambda Function- Introduction-The str class-Basic Inbuilt Python Functions for String-The index[] Operator- Traversing String with for and while Loop-Immutable Strings-String Operations-Introduction: Creating Lists- Accessing the Elements of a List- Negative List Indices-List Slicing-List Slicing with Step Size-Python Inbuilt Functions for Lists- The List Operator- List Methods- List and Strings- Splitting a String in List-Passing List to a Function-Returning List from a Function

UNIT IV: List Processing, Object-Oriented Programming

(18 HOURS)

Introduction: Searching Techniques-Introduction to Sorting-Introduction: Defining Classes-The Self-parameter and Adding Methods to a Class-Display Class Attributes and Methods-Special Class Attributes-Accessibility-The init-Method-Passing an Object as Parameter to a Method- -del()-Class Membership Tests-Method Overloading in Python-Operator Overloading-Inheritance-Types of Inheritance-Inheritance in Detail-Subclass Accessing Attributes of Parent Class-Multilevel Inheritance and Multiple Inheritance in Detail- Using super()-MethodOverriding

UNIT V: Tuples, Sets, Dictionaries, Graphics Programming, File handling

(18 HOURS)

Introduction to Tuples- Sets- Dictionaries-Introduction-Getting Started with the Turtle Module- Moving Turtle to Any Location-The color , bgcolor ,circle and Speed Method of Turtle-Drawing with Colors- Drawing Basic Shapes using Iterations-Changing Color Dynamically Using List-Turtles to Create Bar Charts-Introduction- Need of File Handling-Text Input and Output-The seek() Function- Binary Files

TEXT:

1. Ashok Namdev Kamthane, Amit Ashok Kamthane, “Programming and Problem Solving with Python” ,McGraw Hill Education, 2018.

REFERENCES:

1. Jeeva Jose and P. Sojan Lal, “Introduction to Computing and Problem Solving with Python”, KhannaBook Publishing Co. (P) Ltd., 2016.
2. Ch. Satyanarayana, M Radhika Mani & B N Jagadesh, “Python Programming”, Universities Press, 2018.

WEB REFERENCES:

1. www.learnpython.org/
2. <https://www.codecademy.com/learn/python>
3. <https://www.Codementor.io>
4. <https://www.Python.org>

COURSE DESIGNER

Ms.K.Akila, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE – II
R PROGRAMMING FOR DATA ANALYSIS

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA6MBE2B	R Programming for Data Analysis	MBE - II	90	6	-	5

PREAMBLE:

- To impart knowledge in fundamentals of R using Data Analysis.

COURSE OUTCOME:

- On the successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Recognize Data Analytics Lifecycle	K1
CO2	State Data types and its Values	K1
CO3	Classify Operations and Testing Conditions	K2
CO4	Discuss Functions and Matrices	K2
CO5	Operate Data Frames and Plots	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	S	S	M	M
CO3	M	M	S	S
CO4	M	M	M	L
CO5	M	M	L	L

S-Strong; M-Medium; L-Low

SYLLABUS

UNIT I: Introduction to Data Analytics and R

(18 HOURS)

Data Analytics Lifecycle Overview – Discovery – Data Preparation – Model Planning – Model Building – Communication Results – Operationalize. Understanding R – Installing R – Installing Rstudio – Exploring Rstudio – Setting preferences – Creating an R script - Storing a single value – Adding comments – Recognizing data types – Storing multiple values – Storing mixed data types – Plotting stored values – Controlling objects.

UNIT II: Performing Operation and Testing Conditions

(18 HOURS)

Doing arithmetic – Making comparisons – Assessing logic – Operating on elements – Comparing elements – Recognizing precedence – Manipulating elements – Seeking truth – Branching alternatives – Chaining branches – Switching branches – Looping while true – Performing for loops – Breaking from loops.

UNIT III: Employing Functions and Building Matrices

(18 HOURS)

Doing mathematics – Manipulating strings – Producing sequences – Generating random numbers – Distributing patterns – Extracting statistics – Creating functions – Providing defaults – Building matrix – Transposing data – Binding vectors – Naming rows and columns – Plotting matrices – Adding labels – Extracting matrix subsets – Maintaining dimensions.

UNIT IV: Constructing data frames and Producing quick plots

(18 HOURS)

Constructing a data frame – Importing data sets – Examining data frames – Addressing frame data – Extracting frame subsets Changing frame columns – Filtering data frames – Merging data frames – Adjusting factors – Installing packages – Scattering points – Smoothing lines – Portraying stature – Depicting groups – Adding labels – Drawing columns – Understanding histograms – Producing histograms – Understanding box plots – Producing box plots.

UNIT V: Storytelling with data and Plotting perfection

(18 HOURS)

Presenting data – Considering aesthetics – Using geometries – Showing statistics – Illustrating facets – Controlling coordinates – Designing themes – Loading the data – Retaining objects – Overriding labels – Adding a theme – Restoring the workspace – Comparing boxes – Identifying extremes – Limiting focus – Displaying facets – Exporting graphics – Presenting analyses.

TEXT:

1. EMC Education Services, “Data Science and Big Data Analytics”, John Wiley & Sons, Inc, 2015.
2. Mike McGrath, “R for Data Analysis in easy steps”, In Easy Steps, 2018.

REFERENCES:

1. Dr. Mark Gardener, “Beginning R the Statistical Programming Language”, John Wiley & Sons, Inc, 2012.
2. Jafed P.Lander, “R for Every One”, Pearson Education, 2015.

WEB REFERENCES:

1. <https://www.r-project.org/about.html>
2. <https://www.datacamp.com/community/tutorials/r-or-python-for-data-analysis>
3. https://lgatto.github.io/2017_11_09_Rcourse_Jena/index.html

COURSE DESIGNER

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE – II (MBE)

DIGITAL MARKETING

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA6MBE2C	Digital Marketing	MBE-II	90	6	-	5

PREAMBLE:

- To facilitate the students to develop an overall understanding of digital marketing and online platforms and increase their job opportunities

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Explain the basic concept of Digital Marketing	K1
CO2	Discuss the concepts of Display Advertising	K2
CO3	Discuss the Search Engine Advertising	K2
CO4	Utilize the Social Media Platforms	K3
CO5	Illustrate the Search Engine Optimization	k3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	M	M
CO2	S	S	M	M
CO3	M	M	M	M
CO4	M	M	M	M
CO5	M	M	M	M

S- Strong; M- Medium; L- Low

SYLLABUS

UNIT I: Introduction to Digital Marketing

(18 HOURS)

Introduction- Digital Marketing- Internet Users - Digital Marketing Strategy - Digital Advertising Market in India - Skills Required in Digital Marketing - Digital Marketing Plan.

UNIT II: Display Advertising

(18 HOURS)

Introduction - Concept of Display Advertising - Types of Display Ads - Buying Models - Display Plan - Targeting - Programmatic Digital Advertising - Analytics Tools - YouTube Advertising.

UNIT III: Search Engine Advertising

(18 HOURS)

Introduction - Search Advertising - Ad placement - AdRanks - Creating the First Ad Campaign - Enhance Your Ad Campaign - Performance Reports.

UNIT IV: Social Media Marketing

(18 HOURS)

Introduction - Social Media Marketing Strategies - Facebook Marketing: Facebook for Business - Anatomy of an Ad Campaign - Adverts - Facebook Insights.

UNIT V: Search Engine Optimization

(18 HOURS)

Search Engine- Concept of Search Engine Optimization (SEO) - SEO Phases - On Page Optimization - OffPage Optimisation - Social Media Reach.

TEXT:

Seema Gupta, "Digital Marketing", McGraw Hill Education (India) Private Limited, 2018.

REFERENCES:

1. Puneet Bhatia, "Fundamentals of Digital Marketing", Pearson Publication, 2018.
2. Nitin C Kamat & Chinmay Nitin Kamat, "Digital Social Media", Himalaya Publishing House, 2018.

WEB REFERENCES:

1. www.digitalmarketer.com
2. www.learndigital.withgoogle.com

COURSE DESIGNER

Ms. R. Sridevi, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE- III
PRACTICAL - PYTHON PROGRAMMING

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA6MBE 3AP	Practical - Python Programming	MBE III	75	-	5	5

PREAMBLE:

- To impart the practical training on Python programming

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	derstand and apply the basic concepts of Python	K1
CO2	monstrate the basic concepts of OOPS	K2
CO3	e the knowledge of file concepts	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	M	S	M	M
CO2	M	M	M	M
CO3	S	S	S	M

S- Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. Types of Operators
2. Numbers
3. Strings
4. List & Dictionaries
5. Tuples & Set
6. Flow Control
7. Functions
8. Modules and Packages
9. File Handling
10. Exception Handling

COURSE DESIGNER

Ms. K. Akila, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE - III
PRACTICAL - R PROGRAMMING

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/ Week	Practical Hours/ Week	Credit
19UCA6MBE 3BP	Practical-R Programming	MBE-III	75	-	5	5

PREAMBLE

- To impart practical training on R Programming

COURSE OUTCOME:

- On successful completion of the course, the students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Define usage of R & R studio	K1
CO2	Describe objects & vectors	K2
CO3	Create data frames and matrix	K3
CO4	Manipulate data frames and matrices using functions	K3
CO5	Demonstrate data visualization	K3

MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	S
CO2	S	S	M	M
CO3	M	M	S	S
CO4	M	M	M	L
CO5	M	M	L	L

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. Create R program to take input from the user (name and age) and display the values. Also print the version of R installation.
2. Get the details of the objects in memory using R.
3. Create three vectors such as numeric data, character data and logical data. Display the content of the vectors and their type.
4. Create a simple bar plot of five subjects marks of a student.
5. Create data frames which contain details of 5 employees and display summary of the data.
6. Create an array of two 3x3 matrices for two given vectors.
7. Extract 3rd and 5th rows with 1st and 3rd columns from a given data frame.
8. Generate inner, outer, left, right join (merge) from given two data frames.
9. Demonstrate use of histogram.
10. Demonstrate box plot function.

COURSE DESIGNER

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

MAJOR BASED ELECTIVE – III (MBE)

PRACTICAL - DOT NET PROGRAMMING

Semester: VI

Course Code	Course Title	Category	Learning Hours	Theory Hours/Week	Practical Hours/Week	Credit
19UCA6MBE3CP	Practical- Dot Net Programming	MBE-III	75	-	5	5

PREAMBLE:

- To impart practical training on Dot Net Programming.

COURSE OUTCOME:

- On successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Design a web form using server and standard controls	K3
CO2	Implement form validation in Dot Net	K3
CO3	Connect and manipulate the database with the Dot Net	K3
CO4	Develop a web application by their own	K5

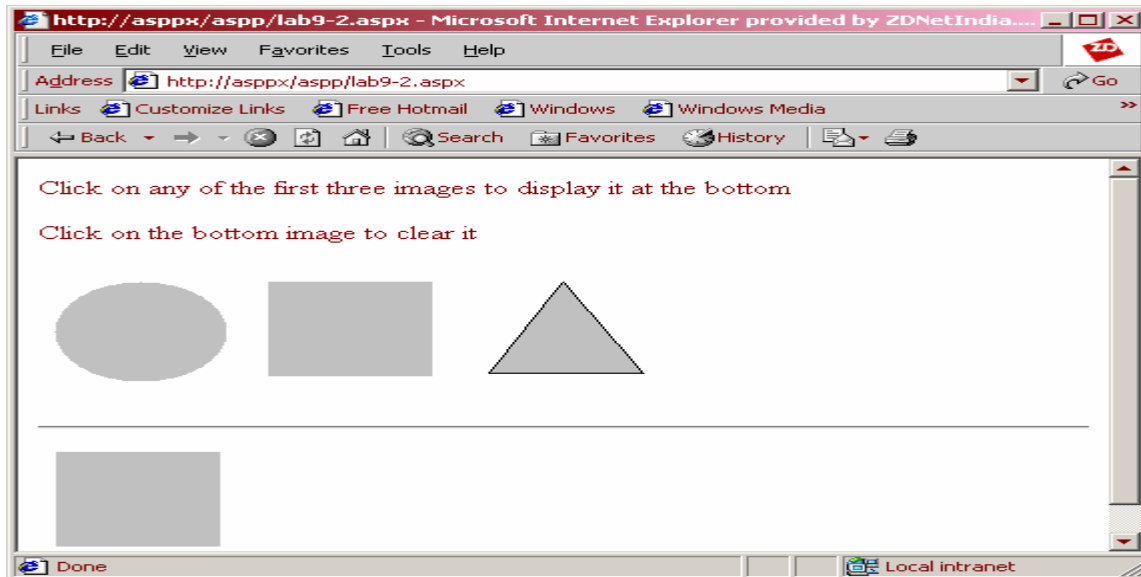
MAPPING WITH PROGRAMME SPECIFIC OUTCOMES:

	PSO1	PSO2	PSO3	PSO4
CO1	S	S	S	M
CO2	S	S	M	M
CO3	S	S	M	L
CO4	S	S	M	L

S-Strong; M-Medium; L-Low

LIST OF PRACTICALS

1. Write a program using Dot Net framework with C# to display three images in a line. When any one of the images is clicked, it must be displayed below. On clicking the displayed image it must be cleared. The screen must look as in the figure given below:



2. Use Dot Net framework with VB.Net to do the following exercises:
 - a) Design ASP.Net web form using HTML Server Controls to enter job seeker's details.
 - b) Create an ASP.Net web form using Web controls to fill E-Mail registration form.
 - c) Validate the E-Mail registration form using the validation controls such as Required Field validator, Regular expression validator, Compare validator and Range validator.
 - d) Write an ASP.Net application to retrieve form data and display it the client browser in a tableformat.
 - e) Create a web application using ADO.Net that uses details view which performs basic data manipulations(Insertion, Updation and Deletion) in MS- Access database.
 - f) Create an application using Details view control to perform the basic data manipulations in SQL server database.
 - g) Create an application using Grid view control to access information from a table in SQL server.
 - h) Create an application using Data list control to access information from table in SQL server and displaythe result in neat format.
 - i) Create a College portal which must include basic database operations such as Insertion, Deletion, Modification, Selection and Searching.

COURSE DESIGNER:

Dr. H. Krishnaveni, Associate Professor, Department of Computer Applications.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
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Annamalai Nagar, Trichy -18



The Agenda for the meeting was as follows:

1. ITEM NO.BOS/07/01

To consider and to approve, the Programme Structure of B.Sc Information Technology for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. ITEM NO.BOS/07/02

To consider and to approve the Ratification of I SEMESTER syllabus of UG Programme of 2022-2023 batch and onwards.

3. ITEM NO.BOS/07/03

To consider and to approve the II semester syllabus of B.Sc Information Technology for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

4. ITEM NO.BOS/07/04

To Appreciate the Board of Studies Members who contributed to prepare the syllabus.

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MINUTES OF THE MEETING

Board of Studies - Department of Information Technology

DATE : 13.10.2022

VENUE : Research Room

TIME : 11.00 am

Members Present

- | | |
|----------------------------|---|
| 1) Dr. M. Parveen | Chairperson, Professor & HoD |
| 2) Dr. Gopinath Ganapathy | University Nominee, Bharathidasan University |
| 3) Dr. Omar A. Beg (Beig) | International Academic Expert |
| 4) Dr. S. Sangeetha | Subject Expert, Other university |
| 5) Dr. E. Ilavarasan | Subject Expert, Other university |
| 6) Mr. I. Johnson | Placement Representative from Industry/Corporate Sector |
| 7) Ms. D. Jeevitha | Alumna, Member |
| 8) Dr. A. R. Jasmine Begum | Member |
| 9) Dr. J. Sangeetha | Member |
| 10) Dr. M. Anandhi | Member |
| 11) Dr. A. Bhuvaneshwari | Member |
| 12) Dr. S. Latha | Member |
| 13) Dr. S. Suguna Devi | Member |
| 14) Dr. P. Tamilselvi | Member |
| 14) Mrs. M. Thangam | Member |

Action taken report of Sixth BoS held on 06.05.2022

The Resolution No. BoS/05/01 to Resolution No. BoS/05/04 in connection with the outcome based Programme structure and syllabus for the semester I of UG degree programme for the batch 2022-2023 and onwards were implemented

Ratification was approved for the UG syllabus of Software Engineering (Major Based Elective Course I) with course code 19UIT5MBE1A and Mobile Application Development (Core course IX) with course code 19UIT6CC9 of Semester V and VI for 2020-2021 batch.

Minutes of the Sixth BoS:

The Minutes of the meeting is as follows:

1. RESOLUTION NO. BOS/07/01

Considered and approved the Programme structure of B.Sc Information Technology for 2022-2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM NO.BOS/07/01

Ratification of UG syllabus of Core course I Programming in C with course code 22UIT1CC1 in semester I for 2022-2023 batch was approved

ITEM NO.BOS/07/02

Considered and approved the II Semester syllabus of B.Sc. Information Technology for 2022-2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

ITEM NO.BOS/07/03

The Programme Outcome/Course Objectives/Course Outcome was found to be compatible with the syllabus.





ITEM NO.BOS/07/04

The Chairman reported to the Members that the Department conducted regular meetings with the faculty members of Information Technology to discuss the contents of the syllabus to be framed by the Department. The Chairman appreciated the efforts of the members of Board of Studies, for their valuable contributions and suggestions in preparing the syllabus.

The following Resolutions were passed by the board

- Course structure of B.Sc. IT programme and the syllabus was approved with effect from 2022-2023

The Board of Studies meeting was resolved and concluded by recommending the Curriculum and Syllabus of UG Information Technology to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

S.NO	NAME AND DESIGNATION	SIGNATURE
1.	CHAIRPERSON Dr. M. Parveen, Professor & Head, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	
2.	UNIVERSITY NOMINEE Dr. GOPINATH GANAPATHY Professor & Head, Department of Computer Science Bharathidasan University Tiruchirappalli – 620 024 Tamil Nadu, INDIA	
3.	INTERNATIONAL ACADEMIC EXPERT Dr. Omar A. Beg (Beig) Assistant Professor & Coordinator of Electrical Engineering College of Engineering Project Director HSI-STEM The University of Texas Permian Basin 4901 East University, Odessa, Texas 79762	Attended through Online
4.	SUBJECT EXPERT Dr. S. Sangeetha Associate Professor Department of Computer Applications National Institute of Technology Tiruchirappalli-620015	
4.	SUBJECT EXPERT Dr. E. Ilavarasan Professor Department of Computer Science and Engineering Puducherry Technological University Puducherry-605014	Attended through Online
5.	INDUSTRIAL REPRESENTATIVE Mr. I. Johnson, Managing Director, Shalom Info Tech, Trichy	
6.	MEMBER ALUMNA Ms. D. Jeevitha, Techno Functional Consultant, Wipro Technologies, Chennai.	Attended through Online

MEMBERS

7.	Dr. A. R. Jasmine Begum, Associate Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>for R...</i>
8.	Dr. J. Sangeetha, Associate Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>J Sangeetha</i>
9.	Dr. M. Anandhi, Associate Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>M. Anandhi</i>
10.	Dr. A. Bhuvaneshwari, Associate Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>A Bhuvaneshwari</i>
11.	Dr. S. Latha, Associate Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>S Latha</i>
12.	Dr. S. Suguna Devi, Assistant Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>S Suguna Devi</i>
13.	Dr. P. Tamilselvi, Assistant Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>P. Tamilselvi</i>
14.	Ms. M. Thangam, Assistant Professor, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	<i>M. Thangam</i>
15.	Student Nominee I II BSc Information Technology, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	
16.	Student Nominee II III BSc Information Technology, Department of Information Technology, Cauvery College for Women (Autonomous), Trichy.	

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18
DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

The department of Information Technology envisions to create technically competent, skilled intellectual IT professionals, efficient problem solvers, innovators and entrepreneurs to meet the current challenges of the modern computing industry.

Mission

- To provide quality education and elevate the students towards higher educational programs
- To encourage and guide the students to improve their competency skills in information technology market
- To equip the students to cater the industrial demands through providing advance training

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)



NATIONALLY ACCREDITED (IICYCLE) WITH “A” GRADE BY NAAC

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PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
	LEARNING ENVIRONMENT
PEO1	To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
	ACADEMIC EXCELLENCE
PEO2	To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
	EMPLOYABILITY
PEO3	To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY
PEO4	To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
	GREEN SUSTAINABILITY
PEO5	To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

Department of Information Technology
(For the Candidates admitted from the Academic year 2022-2023 onwards)

PO NO.	Programme Outcome
	On completion of BSc-IT Programme, The students will be able to
PO 1	Academic Skills & Social Responsibility Apply Computing, Mathematical and Scientific knowledge in various disciplines by understanding the concerns of the society.
PO 2	Critical Thinking and Innovative Progress Design the software applications with varying intricacies using programming languages for innovative learning in techno world to meet the changing demands.
PO 3	Personality Development Perceive Leadership skills to accomplish a common goal with effective communication and understanding of professional, ethical, and social responsibilities.
PO 4	Lifelong Learning Identify resources for Professional development and apply the skills and tools necessary for computing practice to gain real life experiences.
PO 5	Creativity and Holistic Approach Create a Scientific temperament and novelties of ideas to support research and development in Computer Science to uphold scientific integrity and objectivity.

PSO NO	Programme Specific Outcomes Students of B.Sc information Technology will be able to	POs Addressed
PSO1	To apply the knowledge of Science and Computing in Information Technology	PO1
PSO2	Analyze the local and global impact of computing on individuals, organizations, society and implant lifelong learning for professional development	PO4
PSO3	Improve the capability to apply the knowledge in interrelated domains and solve real world problems with modern technological tools	PO2
PSO4	To strengthen the academic quality, effective communication, good ethics and responsibilities during professional practice	PO5
PSO5	Excel in job oriented skills which are required to meet the current demand in the field of IT industry and to become an entrepreneur with confidence	PO3



Cauvery College for Women (Autonomous)
Department of Information Technology

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs./	Credits	Exam			Total
							Hrs	Marks		
								Int.	Ext	
I	I	Language Course -I (LC)	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100
			Hindi literature and Grammar I	22ULH1						
			History of popular Tales literature and Sanskrit story	22ULS1						
			Communication in French I	22ULF1						
	II	English Language Course-I(ELC)	Functional English for Effective Communication- I	22ULE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Programming in C	22UIT1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Programming in C (P)	22UIT1CC1P	3	3	3	40	60	100
		First Allied Course-I(AC)	Essential Mathematics	22UIT1AC1	4	3	3	25	75	100
		First Allied Course-II(AC)	Numerical Analysis & Statistics	22UIT1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2		100		100
Total					30	22				700
II	I	Language Course-II(LC)	இடைக்கால இலக்கியமும் புதினமும்	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course-II(ELC)	Functional English for Effective Communication- II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Data Structures & Algorithms	22UIT2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Data Structures using C(P)	22UIT2CC2P	2	2	3	40	60	100
		Core Course-III(CC)	Digital Fundamentals	22UIT2CC3	4	4	3	40	60	100
		First Allied Course-III(AC)	Operations Research	22UIT2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II(AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Ability Enhancement Compulsory Course-III(AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
		Extra Credit Course	SWAYAM		As per UGC Recommendation					
Total					30	23				800

III	I	Language Course-III (LC)	காப்பியமும் நாடகமும்	22ULT3	5	3	3	25	75	100		
			Hindi Literature & Grammar - III	22ULH3								
			Prose, Textual Grammar and Vakyarachana	22ULS3								
			Intermediate French - I	22ULF3								
	II	English Language Course- II(ELC)	Learning Grammar Through Literature- I	22UE3	6	3	3	25	75	100		
	III	Core Course– IV(CC)	Relational Database Management Systems	22UIT3CC4	6	6	3	25	75	100		
				Core Practical - III(CP)	RDBMS (P)	22UIT3CC3P	3	3	3	40	60	100
				Second Allied Course- I(AC)	Financial Accounting	22UIT3AC4	4	3	3	25	75	100
				Second Allied Course-II(AP)	Computer Applications in Business (P)	22UIT3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course- I(GEC)	Web Design	22UIT3GEC1	2	2	3	25	75	100		
Basic Tamil				22ULC3BT1								
Special Tamil				22ULC3ST1								
	Extra Credit Course	SWAYAM		As per UGC Recommendation								
Total				30	23					700		

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course- IV(LC)	பண்டைய இலக்கியம்	22ULT4	6	3	3	25	75	100		
			Hindi Literature & Functional Hindi	22ULH4								
			Drama, History of Drama Literature	22ULS4								
			Intermediate French - II	22ULF4								
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature- II	22UE4	6	3	3	25	75	100		
	III	Core Course – V(CC)	JAVA Programming	22UIT4CC5	6	6	3	25	75	100		
				Core Practical - IV(CP)	JAVA Programming (P)	22UIT4CC4P	4	4	3	40	60	100
				Second Allied Course- III(AC)	Business Communication	22UIT4AC6	4	3	3	25	75	100
				Internship	Internship	22UIT4INT		2	-	-	-	100
	IV	Generic Elective Course II- (GEC)	Web Design (P)	22UIT4GEC2P	2	2	3	40	60	100		
Basic Tamil				22ULC4BT2				25	75			
Special Tamil				22ULC4ST2								
	Skill Enhancement Course – I(SEC)	PC Packages (P)	22UIT4SEC1P	2	2	3	40	60	100			
	Extra Credit Course	SWAYAM		As per UGC Recommendation								
Total				30	25					800		

V	III	Core Course – VI(CC)	Operating Systems	22UIT5CC6	6	6	3	25	75	100
		Core Course - VII(CC)	Python Programming & Machine Learning	22UIT5CC7	6	6	3	25	75	100
		Core Practical – V(CP)	Programming in Python (P)	22UIT5CC5P	4	4	3	40	60	100
		Core Course – VIII(CC)	Software Engineering	22UIT5CC8	5	5	3	25	75	100
		Discipline Specific Elective – I(DSE)	A.Mobile Application Development	22UIT5DSE1A	5	4	3	25	75	100
			B.Big Data	22UIT5DSE1B						
	C.Cloud Computing		22UIT5DSE1C							
	IV	Ability Enhancement Compulsory Course- IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II(SEC)	Digital Marketing (P)	22UIT5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As per UGC Recommendation						
Total					30	29				700

VI	III	Core Course – IX(CC)	Computer Networks	22UIT6CC9	6	6	3	25	75	100
		Core Course– X(CC)	Web Technologies	22UIT6CC10	5	5	3	25	75	100
		Core Course– XI(CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Core Practical – VI(CP)	Web Technologies (P)	22UIT6CC6P	3	3	3	40	60	100
		Discipline Specific Elective – II(DSE)	A.Internet of Things	22UIT6DSE2A	5	4	3	25	75	100
			B.C# Programming	22UIT6DSE2B						
			C.Artificial Intelligence	22UIT6DSE2C						
	Project Work	Project Work	22UIT6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1		100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total					30	28				700
Grand Total					180	150				4400

Semester I	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS1CC1/ 22UCA1CC1/ 22UIT1CC1	PROGRAMMING IN C	CORE COURSE – I(CC)	5	5

Course Objectives

- To understand the basics of C language
- To get the deep knowledge of programming using C language
- To develop logics which will help them to create programs and applications in C
- Enhance skill on problem solving by constructing algorithms

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Define the basic concepts of C Programming	K1
CO2	Illustrate the components of C programming	K2
CO3	Build algorithms and data structures swiftly and faster computation using programs	K3
CO4	Apply the knowledge of programming concepts to develop programs	K4
CO5	Solve real time problems using C	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	1	2	2	2	3	2
CO2	3	2	3	2	3	3	3	2	3	2
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	2	3	2	3	2	2	2	3	3
CO5	3	3	3	2	3	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Developing a program in C: Algorithm-Pseudocode-Flowchart- Planning a C program- Writing a C program- Compile and Run a C Program- Overview of C: – Structure of C program – Character set-Tokens – Data types – Variables – Declaration of variables - symbolic constant – Operators and Expressions	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
II	Managing Input and Output Operations: Reading and Writing a character -Formatted Input and Output. Decision Making and Branching: If, Switch, The ?: operator - The GoTo Instruction – Decision Making and Looping: Introduction – While, DO, For Statements –Jumps in Loops.	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
III	Array: One dimensional array – Two and multidimensional array – Character array – String functions – User-Defined Functions: Need for User -Defined Functions –A Multi-Function Program-Elements of User-Defined Functions-Definition of Functions –Return values and Their Types-Function Calls- Function Declaration- Category of Functions – Nesting of Functions - Recursion - Storage Class-The scope and lifetime of variables in functions.	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
IV	Structures and Unions: Structure definition – Structure Initialization – Array of structure – Array within structure –Structure within Structure-Union– Pointers: Understanding pointers - Accessing the address of a variable - Declaring and Initializing pointers - Accessing a variable through its pointers - Pointer Expressions - Pointers and Arrays - Pointers and Character strings.	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
V	File Management: Defining and Opening File –Closing a File – I/O operations on Files – error handling during I/O operations – Random Access to Files- Command Line Arguments.	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Develop algorithms for real time scenario, Area calculations, and Conversion programs, swapping numbers (with and without using temporary variable). Programs for checking eligibility, Triangle formation, Sum of numbers, sum of series, Array manipulations (Sorting, searching, insert, delete and merging), String handling programs, Dynamic memory management using pointers, Employee pay bill preparation using Files.	-	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5

Textbook

1. Balagurusamy.E. (2017). Programming in ANSI C, 7th Edition, Mc Graw Hill Education New Delhi.
2. Byron Gottfried. (2018). Programming with C, 4th Edition, Tata McGraw Hill.

References

1. Yashavant Kanetkar, (2020). Let Us C, 16th Edition, BPB Publications, New Delhi.
2. Ashok N. Kamthane, Amit Ashok Kamthane (2015). Programming in C, 3rd Edition, Pearson India Education Services Pvt. Ltd.

Web References

1. <https://www.learn-c.org/>
2. <https://www.cprogramming.com/>
3. <https://www.tutorialspoint.com/cprogramming/index.htm>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designers

1. Dr. M. Anandhi, Associate Professor, Department of Information Technology.
2. Ms. R. Sridevi, Assistant Professor, Department of Computer Applications.

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT1CC1P	PROGRAMMING IN C (P)	CORE COURSE I(CP)	3	3

Objectives:

- To develop and execute C programs
- To apply the knowledge of control structures, Arrays and functions
- To manipulate C functions

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall program execution and Debugging	K1
CO2	Demonstrate the ideas of control structures	K2
CO3	Make use of functions, arrays, apply string handling functions and develop files	K3
CO4	Develops the ability to analyze a problem and implement an algorithm to solve it.	K4
CO5	Acquire logical thinking, Identify the correct and efficient ways of solving problems	K5

Mapping with Programme Outcomes

COs\ POs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	2	3	1	2	3
CO2	3	2	3	2	3	3	2	2	2	3
CO3	3	2	2	2	2	3	3	2	3	2
CO4	3	3	2	3	2	3	3	2	3	3
CO5	3	3	3	2	3	3	3	3	2	3

Syllabus

1. Simple Programs
2. Control Structures – Branching statements
3. Control structures – Looping statements
4. Array Manipulations
5. Handling Strings
6. Implementation of functions
7. Applications of Pointers
8. Structures and Files
9. Programs using Graphics functions
10. Simple game programs
11. Special programs

- Ring a bell
- Printing patterns
- String tokenizer
- Use Sleep function

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22UCS1AC1/ 22UCA1AC1/ 22UIT1AC1	ESSENTIAL MATHEMATICS	ALLIED	4	3

Course Objectives

- **Apply** the basic concepts of Differentiation, Integration and their applications.
- **Compute** mathematical quantities using ordinary and partial differential equations.
- **Explore** fundamental concepts in graph theory.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember and recall the basic concept of essential mathematics.	K1
CO2	Illustrate the various notions in the respective streams.	K2
CO3	Apply the different terminologies of essential mathematics.	K3
CO4	Classify the solution of mathematical problems using various techniques.	K4
CO5	Examine the solution of mathematical problems.	K5

Mapping with Programme Outcomes

COs\ POs	PSO1	PSO2	PSO3	PSO4	PSOS	POI	P02	P03	P04	POS
CO1	3	2	3	3	3	3	3	3	2	3
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	2	3	3	3	3	3	3	2	2
CO4	3	2	2	3	3	3	3	3	3	2
CO5	3	2	3	3	3	3	3	3	2	2

"1" - Slight (Low) Correlation--, "2" - Moderate (Medium)

Correlation--, "3" - Substantial (High) Correlation--, "-" indicates there is no correlation.

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>Matrices</p> <p>Matrix - Special types of matrices - Scalar multiplication of a matrix - Equality of matrices - Addition of matrices - Subtraction - Multiplication of Matrices - Inverse matrix- Relation between adjoint and inverse matrices - Solution of simultaneous equations - Rank of a matrix - A system of m homogeneous linear equations in n unknowns - System of non-homogeneous linear equations - Eigen values and Eigenvectors - Similar matrices- Cayley-Hamilton Theorem (proof not needed) - Simple applications only</p>	12	CO1, CO2, CO3, CO4, COS	K1,K2,K3, K4
II	<p>Differentiation</p> <p>Maxima and Minima (Problems Only) -Points of inflexion.</p> <p>Partial differentiation</p> <p>Functions of function rule - Total Differential Coefficient - A Special case - Implicit Functions - Homogeneous functions - Euler's Theorem- (proof not needed) - Simple problems only.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
III	<p>Integration</p> <p>Integration of Rational algebraic functions - Rule (a) - Rule (b): Type $\int \frac{ax^2+bx+c}{ax^2+bx+c}$ Type 11:</p> <p>$\int \frac{ax^2+bx+c}{ax^2+bx+c} dx$ - Integration of Irrational functions : Case (ii) Integration of the form $\int \frac{P(x)}{Q(x)} dx$ - Type $\int \frac{ax}{ax^2+bx+c} dx$ - Properties of definite integrals.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
IV	<p>Differential Equations</p> <p>Linear Differential Equation with constant coefficients - The Operators D and D^{-1} - Particular Integral - Special methods of finding P.I.: Xis of the form (a) e^{ax} (b) $\cos ax$ or $\sin ax$, where a is a constant (c) x^m (a power of x), m being a positive integer (d) $e^{ax}V$, where V is any function of x.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
V	<p>Graph Theory</p> <p>Introduction - Definition of Graphs - Applications of Graphs - Finite and infinite graphs - Incidence and Degree - Isolated Vertex, Pendant Vertex and Null Graph.</p>	12	CO1, CO2, CO3, CO4, COS	K1,K2,K3, K4

	Path and Circuits Isomorphism - Subgraphs - Walks, Paths and Circuits - Connected Graphs, Disconnected Graphs and Components - Euler graphs.			
VI	Self-Study for Enrichment (Not included for End Semester Examination) Symmetric matrix - Skew symmetric matrix - Hermitian and skew Hermitian matrices Concavity and Convexity- Integration by parts - Linear equation - Hamiltonian Paths and Circuits.	-	CO1, CO2, CO3, CO4, COS	K1,K2,K3, K4

Textbook

1. T.K.Manicavachagom Pillay, T.Natarajan, K.S.Ganapathy.(2015). Algebra, Volume II. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
2. S.Narayanan, T.K.Manicavachagom Pillay. (2015). Calculus, Volume I. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
3. S.Narayanan, T.K.Manicavachagom Pillay. (2015). Calculus, Volume II. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
4. S.Narayanan, T.K.Manicavachagom Pillay. (2015). Calculus, Volume III. S. Viswanathan (Printers & Publishers) Pvt., Ltd.
5. Narsingh Deo. (2003). Graph Theory with applications to Engineering and Computer. Prentice Hall of India Private Limited

UNIT-I	Chapter 2: Section 1 to 5, 7, 8, 10 to 16[1]
UNIT-II	Chapter V: Section 1.1 to 1.5[2] Chapter VIII: Section 1.2 to 1.6[2]
UNIT-III	Chapter 1: Section 7.1 to 7.3, 8 (CASE II), 9, 11[3]
UNIT-IV	Chapter 2: Section 1 to 4[4]
UNIT-V	Chapter 1: Section 1.1 to 1.5[5] Chapter 2: Section 2.1, 2.2, 2.4 to 2.6[5]

References

1. A.Singaravelu. (2003). *Allied Mathematics*. AR.Publications
2. P.R.Vittal. (2014). *Allied Mathematics*. Margham Publications, Chennai.
3. S.Arumugam and S.Ramachandran.(2006). *Invitation to Graph Theory*. Sci Tech Publications (India) Pvt Ltd., Chennai

Web References

1. <https://youtu.be/rowWM-MiiXU>
2. <https://youtu.be/fOyxWaOnrgl>
3. <https://youtu.be/pvLils7S0tk>
4. https://youtu.be/Gxr3AT4NY_0
5. <https://youtu.be/xlbbefbYLzg>
6. <https://youtu.be/bORJkIBhfEM>
7. <https://youtu.be/s5KZw1EpBEo>

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designers

1. Dr. V. Geetha
2. Dr. S. Sasikala

Semester I	Internal Marks: 25			External Marks:75
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / Week	CREDITS
22UCS1AC2/ 22UCA1AC2/ 22UIT1AC2	NUMERICAL ANALYSIS AND STATISTICS	ALLIED	4	3

Course Objective

- **Understand** the implementation of various methods of Numerical Analysis.
- **Organize** and **summarize** the statistical data.
- **Analyze** and **evaluate** the strengths of the conclusions based on data.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Understand the list of basic ideas of Numerical Methods and Statistics.	K1, K2
CO2	Solve the problems using various methods and also classify the given datas.	K2, K3
CO3	Identify the conceptual collection and classification of variables.	K3
CO4	Analyze the accuracy and graphical representation of statistical datas.	K4
CO5	Support the implementation of numerical methods and statistical datas.	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	3	2
CO2	3	3	2	2	2	3	2	3	2	3
CO3	2	3	3	2	2	2	3	3	2	3
CO4	3	2	3	2	2	3	3	2	3	2
CO5	3	3	2	3	3	3	2	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Solution of Algebraic & Transcendental Equations: Introduction – The Bisection Method – The Iteration Method – Newton-Raphson Method (Problems Only) Interpolation: Finite Differences: Forward Differences, Backward Differences – Newton’s Formulae for Interpolation – Interpolation with unevenly spaced Points: Lagrange’s Interpolation formula	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Numerical Integration: Numerical Integration: Simpson’s 1/3-Rule – Simpson’s 3/8-Rule (proof not needed). Linear Systems of Equations: Solution of Linear Systems–Direct Methods: Gaussian Elimination Method – Solutions of Linear Systems – Iterative Methods (Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Numerical solution of Ordinary Differential Equations: Introduction – Euler’s Method – Modified Euler’s Method – Runge-Kutta Methods – Predictor - Corrector Methods : Adams-Moulton Method	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Measures of Central Tendency: Arithmetic Mean – Median – Mode – Geometric Mean – Harmonic Mean. Measures of Dispersion: Mean Deviation – Standard Deviation (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Correlation: Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson’s co-efficient of Correlation – Rank Correlation: Spearman’s Rank Correlation Coefficient (Derivation not needed and Simple Problems Only). Linear Regression: Introduction – Linear Regression (Derivation not needed and Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self Study for Enrichment: (Not included for End Semester Examination) The method of False Position & Central Differences - Trapezoidal rule - Solution by Taylor’s Series and Milne’s Method - Range – Quartile Deviation - Rank Correlation (Repeated Ranks).	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Sastry S. S. (1998). Introductory methods of Numerical Analysis, Third Edition. Prentice Hall of India Private Limited.
2. Gupta. S.C & Kapoor, V.K (2007). Fundamentals of Mathematical Statistics. Sultan Chand & sons, New Delhi.

UNIT – I	Chapter 2: Sections 2.1 - 2.3(Omit 2.3.1), 2.5(Omit 2.5.1) [1] Chapter 3: Sections 3.3 (Omit 3.3.4), 3.6, 3.9(3.9.1 only) [1]
UNIT – II	Chapter 5: Sections 5.4(5.4.2 & 5.4.3 only) [1] Chapter 6: Sections 6.3(6.3.2 only) & 6.4 [1]
UNIT – III	Chapter 7: Sections 7.1, 7.4- 7.6 (Omit 7.4.1 & 7.6.2) [1]
UNIT – IV	Chapter 2: Sections 2.5 - 2.9, 2.13 (Omit 2.13.1 & 2.13.2) [2]
UNIT –V	Chapter 10: Sections 10.1 - 10.4, 10.7(10.7.1 Only) [2] Chapter 11: Sections 11.1 & 11.2 [2]

Reference Books

1. Jain M. K, Iyengar S. R.K. and Jain R.K. (1999). Numerical Analysis Numerical Methods for Scientific and Engineering Computations. New Age International Private Limited.
2. Froberg C.E. (1979). Introduction to Numerical Analysis. II Edition. Addison Wesley

Web Links

1. <https://youtu.be/qCzUXav5Nk>
2. <https://youtu.be/r6MTvrI8SQ4>
3. <https://youtu.be/s05dONL4xAs>
4. <https://youtu.be/XaHFNhHfXwQ>
5. <https://youtu.be/zPG4NjIkCjc>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designers

1. Dr.R.Buveneswari
2. Ms.A.Gowri Shankari

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT2CC2	DATA STRUCTURES AND ALGORITHMS	CORE COURSE – II(CC)	5	5

Course Objectives

- To provide the knowledge of basic data structures and their implementations.
- To understand the importance of data structures in the context of writing efficient programs.
- To develop skills to apply appropriate data structures in problem solving.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand the abstract data types and basics of Algorithms	K1
CO2	Demonstrate the performance of basic linear and nonlinear data structures	K2
CO3	Implement the basic data structures and Algorithm design techniques	K3
CO4	Analyze the efficiency and proofs of correctness	K4
CO5	Assess, evaluate and choose appropriate data structure and algorithmic technique to solve real-world problems.	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2	3	2	1	2	2
CO2	2	2	3	2	2	1	2	1	2	2
CO3	3	3	3	2	3	3	3	1	3	3
CO4	3	2	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Introduction: Data structures-Abstract data types-What is an Algorithm?-Goal of the Analysis of Algorithms-Types of Analysis-Stacks: Stack - Stack ADT- Applications – Simple array Implementation-Problems and solution(Problem 2)- Queue: Queue ADT – Exceptions – Applications – Simple array Implementation-Problems and solutions(Problem 2)	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
II	Linked list: Introduction- Linked Lists ADT - Arrays overview - Singly Linked Lists - Doubly Linked Lists - Circular Linked Lists	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
III	Trees : Glossary - Binary Trees - Types of Binary Trees - Properties of Binary Trees - Binary Tree Traversals – Problems and Solutions(Problem 3). Graphs: Introduction – Glossary - Applications of Graphs - Graph Representation- Graph Traversals - Topological Sort	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
IV	Sorting and searching:Sorting definition-Classification of sorting algorithms-Bubble,Selection and Insertion sort-Searching Definition-Type of searching-Unordered and ordered Linear Search-Binary search	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
V	Algorithm design techniques-Greedy algorithm- Greedy strategy-Advantages and Disadvantages - Applications- Problems & Solutions(Problem 1-3)-Divide and Conquer: Introduction-strategy-Advantages and disadvantages-Applications-Problems and solutions(Problem 6)	15	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5
VI	Self Study for Enrichment (Not included for End Semester Examinations) Reverse the elements of the stack using only stack operations(push &pop)-Implement one queue efficiently using two stacks- Perform polynomial addition using Linked list-Convert a tree to its mirror-Find shortest path- At a railway station for a schedule of trains arrival and departures find the minimum number of platforms so that all trains can be accommodated using Greedy algorithm	-	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4,K5

Textbook

1. Narasimha Karumanchi, N. (2017). Data structures and algorithms made easy, 5th Edition, CareerMonk Publications.

Reference Books

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C.Stein (2022), Introduction to Algorithms, 4th Edition, MIT Press
2. ISRD Group, (2009). Data Structures Using, Tata McGraw Hill Education Pvt. Ltd, New Delhi.
3. Ellis Horowitz, Sartaj Sahni and Susan and Rewson-Freed(2008), Fundamentals of Data Structures in C,2nd Edition, Universities Press

Web References

1. <https://www.geeksforgeeks.org/data-structures>
2. https://www.tutorialspoint.com/data_structures_algorithms/index.html
3. <https://ocw.mit.edu/courses/6-006-introduction-to-algorithms-spring-2020/>

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. M. Anandhi, Associate Professor, Department of Information Technology.

Semester II	Internal Mark: 40		External Mark: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT2CC2P	DATA STRUCTURES USING C (P)	CORE PRACTICAL – II(CP)	2	2

Objectives:

- To develop and execute C programs for various data structures
- To apply the knowledge of programming features
- To Implement various Algorithms

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Recall program execution and Debugging	K1
CO2	Demonstrate the ideas of Data structures	K2
CO3	Make use of Operations of Linear and Non- linear data structures	K3
CO4	Develops the ability to analyze a problem and implement an algorithm to solve it.	K4
CO5	Acquire logical thinking, Identify the correct and efficient ways of solving problems	K5

Mapping with Programme Outcomes

COs\POs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2	3	2	1	2	2
CO2	3	2	3	1	2	3	2	2	2	2
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	2	2	2	2	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

Syllabus

1. Stack implementation
2. Operations on Queue
3. Linked list
4. Binary tree traversal
5. Operations of Graph
6. Sorting
7. Searching
8. Greedy method
9. Divide and Conquer

Course Designer

1. Dr. M. Anandhi, Associate Professor, Department of Information Technology.

Semester II	Internal Mark: 25		External Mark: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UIT2CC3	DIGITAL FUNDAMENTALS	CORE COURSE –III(CC)	4	4

COURSE OBJECTIVE

- To provide knowledge on various number systems
- To inculcate the concepts of Boolean algebra
- To make the students learn combinational circuits
- To make the students learn combinational circuits

COURSE OUTCOMES

On the successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics of digital logic	K1
CO2	Apply the conversion of number system	K3
CO3	Apply the Boolean algebra to generate digital circuits	K3
CO4	Design combinational circuits using gates	K5
CO5	Construct sequential circuits using registers	K4

Mapping with Programme Specific Outcomes and Programme Outcomes

COs\ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	2	2	2	3	2
CO2	3	2	3	2	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	2	3	3
CO4	3	2	3	2	3	2	2	2	3	3
CO5	3	3	3	2	3	3	3	2	2	3

“1” – Slight (Low) Correlation “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	NUMBER SYSTEMS AND CODES: Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Binary Addition and Subtraction – Binary subtraction by 1's and 2's complement – 9's and 10's complement Binary Multiplication and Division – Octal Numbers – Hexadecimal Numbers – Binary Codes – 8421 code - Error Detecting and Correcting Codes.	12	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5
II	BOOLEAN ALGEBRA AND LOGIC GATES: Boolean Algebra – Laws and Theorems – Minterms and Maxterms — DeMorgan's Theorems. Logic Gates: AND, OR, NOT, NAND,NOR and Exclusive OR Gates – Exclusive NOR Gate –Universal Building Blocks (UBB) – NAND Gate as UBB – NOR Gate as UBB- Simplifying logic circuits- Sum of products and products of sum form	12	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5
III	K MAP TECHNIQUES: Simplification of Boolean expression using Karnaugh Map with 2, 3 and 4 variables -Sum of Products - Product of Sum — Don't Care Conditions – Overlapping Groups – Rolling the Map – Eliminating Redundant Group	12	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5
IV	COMBINATIONAL LOGIC CIRCUITS: Half and Full Adders – BCD Adder - Half and Full Subtractors – Multiplexers (4:1 line) – 1 to 4 line Demultiplexers – Decoders, Encoders	12	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5
V	SEQUENTIAL LOGIC CIRCUITS: Flip Flops – RS Flip Flop – Clocked RS Flip Flop – D Flip Flop – JK Flip Flop – T Flip Flop – Triggering of Flip Flops – Master Slave Flip Flop – Clock – Counters and Shift Registers: Counters – Asynchronous or Ripple Counter – Ring Counter. Shift Registers.	12	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5
VI	Self Study for Enrichment Gray Code – Excess – 3 Code NAND and NOR Implementation — AND-OR-INVERT Implementation – OR-AND-INVERT Implementation - SISO – SIPO – PIPO – PISO	-	CO1, CO2, CO3, CO4, CO5	K1,K2, K3,K4, K5

Text Book

Digital Logic and Computer Design. (2017). M. Morris Mano, India: Pearson India.

Reference Book

1. Principles of Digital Electronics, Dr. K. Meena, PHI Learning Private Limited, New Delhi, 2009.
2. Malvino and Leach –Digital Principles and Application, 2014

Web Reference

1. <https://archive.org/details/digitalcomputerf00bart 9>.
2. <https://www.pdfdrive.com/digital-computer-fundamentals-computerarchitecture-e5719965.html>
3. <https://ocw.mit.edu/courses/6-042j-mathematics-for-computer-science-spring-2015/resources/digital-logic/>

Course Designer

Dr.P.Tamilselvi, Assistant Professor, Department of Information Technology

Semester II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
22UCS2AC3/ 22UCG2AC3/ 22UCA2AC3/ 22UIT2AC3/	OPERATIONS RESEARCH	ALLIED III	4	3

Course Objective

- **Understand** the various features of Operations research.
- **Analyze** the optimum solutions using Operations research.
- **Explore** the concepts of Operations research in real life problems.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the various techniques of Operations research.	K1
CO2	Illustrate the various notions in the respective streams.	K2
CO3	Identify the different terminologies of Operations research	K3
CO4	Analyze the solutions of mathematical problem using specific techniques.	K4
CO5	Simplify the optimum solutions of a mathematical problem.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	3	3	2	3
CO2	3	2	3	3	2	3	3	3	3	2
CO3	3	2	3	3	2	3	2	3	2	2
CO4	3	2	2	2	2	3	3	2	3	2
CO5	3	2	3	2	2	3	3	3	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Operations Research Introduction-Origin and Development of O.R.- Nature and Features of O.R.- Scientific Method in O.R.- Modelling in Operations Research - Advantage and Limitation of Models- General Solution Methods for O.R. Models- Methodology of Operations Research- Operations Research and Decision Making</p> <p>Linear Programming Problem- Mathematical Formulation Introduction-Linear programming Problem-Mathematical Formulation of the problem -Illustrations on Mathematical Formulation of LPPs.(simple problems only)</p> <p>Linear programming problem-graphical Solution and Extension Introduction- Graphical Solution Method- General Linear Programming Problem- Canonical and Standard Forms of LPP.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
II	<p>Linear Programming Problem-Simplex Method Introduction-Fundamental Properties of Solutions- The computational Procedure- The Simplex Algorithm - Use of Artificial Variables-Big M method.(simple problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
III	<p>Transportation problem Introduction-LP Formulation of the Transportation Problem- Existence of Solution in T.P-The Transportation Table-Loops in Transportation Table-Solution of a Transportation Problem-Finding an Initial Basic Feasible Solution-Test for Optimality-Economic interpretation of u_j's and v_j's - Degeneracy in Transportation Problem-Transportation Algorithm (MODI method), (simple problems only).</p> <p>Assignment Problem Introduction-Mathematical Formulation of the Problem- Solution Methods of Assignment Problem- Special Cases in Assignment Problems(simple problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
IV	<p>Sequencing problem Introduction-Problem of Sequencing-Basic Terms Used in Sequencing- Processing n Jobs through Two Machines- Processing n Jobs through k Machines(problems only).</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
V	<p>Network Scheduling by PERT/CPM Introduction- Network: Basic Components- Logical Sequencing- Rules of Network Construction- Concurrent Activities - Critical Path Analysis -Probability Considerations in PERT.</p>	12	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
VI	<p>Self-Study for Enrichment (Not included for end semester examination) Application of Operations Research. – Two-Phase method – The Travelling Salesman problem – Processing 2 Jobs through k Machines –. Inventory Models(without shortage)</p>	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4

Text Books

1. Kanti Swarup, P.K. Gupta, Manmohan.(2019). *Operations research, Sultan Chand Publications.*

Chapters and Sections

- UNIT-I Chapter 1: Sections 1:1 – 1:9
Chapter 2: Sections 2:1 – 2:4
Chapter 3: Sections 3:1 – 3:5
- UNIT II Chapter 4: Sections 4:1 – 4:4
- UNIT-III Chapter 10: Sections 10:1 – 10:3, 10:5, 10:6, 10:8 – 10:13
Chapter 11: Sections 11:1 – 11:4
- UNIT-IV Chapter 12: Sections 12:1 – 12:5
- UNIT-V Chapter 25: Sections 25:1 – 25:7

Reference Books

1. Hamdy A.Taha (2017), *Operations Research An Introduction*, Pearson India Education services PVT Ltd.
2. Premkumar Gupta, Hira D.S.(2004), *Operations Research*, S.Chand & Company Ltd, New Delhi.
3. Chandrasekhara Rao.K,Shanti Lata Mishra(2008), *Operations Research*, Narosa Publishing House PVT Ltd, New Delhi.

Web References

1. <https://www.britannica.com/topic/operations-research>
2. <https://byjus.com/maths/linear-programming/>
3. <https://www.gatexplore.com/transportation-problem-study-notes/>
4. <https://youtu.be/rowWM-MijXU>
5. <https://youtu.be/TQvxWaQnrqI>
6. https://youtu.be/RTX-ik_8i-k
7. <https://youtu.be/s5KZw1EpBEo>

Pedagogy

Power point presentation, Group discussion, Seminar, Assignment.

Course Designers

1. Dr. V. Geetha
2. Dr. S. Sasikala



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with A Grade by NAAC
ISO 9001:2015 Certified
Annamalai nagar, Trichy-18.

PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

Agenda for the Seventh Meeting of BoS

DATE: 14.10.2022

VENUE: Dr.Mrs. Rameshwari Nallusamy Hall

TIME: 10.00 am

THE AGENDA FOR THE SEVENTH MEETING OF THE BOS

1. ITEM NO. BOS/07/01

To consider and to approve the Programme Structure (Six semesters) of **B.Sc. Microbiology** for 2022 -2023 batch and onwards and recommend to the Academic Council, CauveryCollege for Women (Autonomous), Trichy.

2. ITEM NO. BOS/07/02

To consider and to approve the Ratification of I Semester syllabus of **B.Sc. Microbiology** for 2022-2023 batch an onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

3. ITEM NO. BOS/07/03

To consider and to approve the II Semester syllabus of **B.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

4. ITEM NO. BOS/07/04

To consider and to approve the Programme Structure (Four Semesters) of **M.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

5. ITEM NO. BOS/07/05

To consider and to approve the Ratification of I Semester syllabus of **M.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

6. ITEM NO. BOS/07/06

To consider and to approve the II Semester syllabus of **M.Sc. Microbiology** 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

7. ITEM NO. BOS/07/07

To include Internship as extra credit course in semester V of **B.Sc. Microbiology** for the batch 2021 -2022 and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

8. ITEM NO. BOS/07/08

Any other matter with the permission of the Chair.



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Annamalai Nagar, Trichy -18.
PG & RESEARCH DEPARTMENT OF MICROBIOLOGY

MINUTES OF THE SEVENTH MEETING OF THE BOS

DATE: 14.10.2022

VENUE: Dr.Mrs. Rameshwari Nallusamy Hall

TIME: 10.00 am

Members Present:

1. Dr. B. Thamilmaraiselvi Chairperson, Professor & HOD
2. Dr. A. Veera Ravi Subject Expert, Alagappa University
3. Dr.V.Rajesh Kannan Subject Expert, Bharathidasan University
4. Dr.P.U.Magalingam Subject Expert, Gandhigram Rural Institute
5. Dr. N. Thajuddin Special Invitee, Bharathidasan University
6. Dr.Nazeerullah Overseas Subject Expert,
Rahamathullah Gulf Medical University
7. Dr. R. Senthil Kumar Member, Placement Representative
from Industry Corporate Sector
8. Mrs.E.Uma Rani Member, Alumna
9. Dr. N. Pushpa Member, Associate Professor
10. Dr. S. Jeyabharathi Member, Assistant Professor
11. Dr. N. Jeenathunisa Member, Assistant Professor
12. Ms. K. Sangeetha Member, Assistant Professor
13. Ms. S. Sathya Member, Assistant Professor
14. Dr.N.Sathammai Priya Member, Assistant Professor
15. Dr. R. Nithyatharani Member, Assistant Professor
16. Dr. P.F. Steffi Member, Assistant Professor
17. Dr. S. Jenny Member, Assistant Professor
18. Dr. E. Priya Member, Assistant Professor
19. Dr. V. Aruna Member, Assistant Professor
20. Dr. P. Bhuvaneshwari Member, Assistant Professor

ACTION TAKEN REPORT OF SIXTH BOS HELD ON 06.05.2022

The Chairman of the BoS read the minutes of the Sixth BoS Meeting which was held on 06.05.2022, and the following resolutions were confirmed

- PSO, Programme Structure and I Semester Syllabus of 2022-2023 batch framed for
BSc Microbiology
MSc Microbiology
- Panel of External examiners and question paper setters were discussed and confirmed.

MINUTES OF THE SEVENTH MEETING OF BOS HELD ON 14.10.2022

The following Resolutions were passed by the BoS members

RESOLUTION NO. BOS/07/01

Resolved to approve the Programme Structure (Six semesters) of B.Sc. Microbiology for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

Dr. A. Veera Ravi and Dr.P.U.Magalingam suggested to include Applied Biochemistry as first allied course in the programme structure .

Dr. A. Veera Ravi suggested to include Microbial diversity as III Core course in the programme structure.

Dr.V.Rajesh Kannan suggested to include Immunology as core course IV

Dr. N. Thajuddin suggested to include Medical Microbiology as core course V

Dr.Nazeerullah Rahamathullah suggested to include Agricultural and Environmental Microbiology as core course VI

Resolved to carry out the changes in the Programme Structure as given in Annexure A

RESOLUTION NO. BOS/07/02

Considered and approved the Ratification of I Semester syllabus of **B.Sc. Microbiology** for 2022- 2023 batch and onwards and forwarded to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**.

RESOLUTION NO. BOS/07/03

Resolved to approve the II Semester syllabus of **B.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure B**.

RESOLUTION NO. BOS/07/04

Resolved to approve the Programme Structure (Four semesters) of M.Sc. Microbiology for 2022- 2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given **in Annexure C**.

Dr. A. Veera Ravi suggested to include clinical virology and parasitology for the academic year of 2023-24 onwards.

Suggestions were given to change Core Course– IV (CC) Microbial metabolism as Core Choice Course – I (CCC) Elective instead of Core Course

Dr.P.U.Magalingam suggested to include Bacteriology and Mycology as Core Course IV (CC).

Dr. R. Senthil Kumar suggested to change the paper title as Immunology and Immunotechnology as Core Course (V).

Dr. A. Veera Ravi suggested to include Microbial Metabolism as Core Choice Course-I (CCC) A.

Dr.V.Rajesh Kannan suggested to include Environmental and Agricultural Microbiology as Core Choice Course-(CCC) B.

Dr.P.U.Magalingam suggested to include Microbial Ecology as Core Choice Course-I (CCC) C.

Dr. A. Veera Ravi suggested to include Molecular Biology and Microbial Genetics as Core Course VI (CC).

Dr.V.Rajesh Kannan suggested that Competitive exam paper can be included in Discipline Specific Elective Course III (DSE) A.

Dr. R. Senthil Kumar Introduced Food and Dairy Microbiology as Core Course VII (CC).

Dr. N. Thajuddin suggested to include Food Quality Testing as Generic Elective Course I (GEC).

Dr.P.U.Magalingam suggested to include Bioprocess Technology as Core Course VIII (CC).

Dr. A. Veera Ravi suggested to include Computational Biology as Core Choice Course III (CCC).

Resolved to carry out the changes in the Programme Structure as given in Annexure C

RESOLUTION NO. BOS/07/05

Considered and approved the Ratification of I Semester syllabus of **M.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy given **in Annexure D**.

RESOLUTION NO. BOS/07/06

Resolved to approve the II Semester syllabus of **M.Sc. Microbiology** for 2022-2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy as given in **Annexure D**.

RESOLUTION NO. BOS/07/07

Board of studies members suggested to include Internship as extra credit course in semester V of **B.Sc. Microbiology** for the batch 2021 -2022 and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy.

RESOLUTION NO. BOS/07/08

The Chairman appreciated the efforts of the members of BoS, for their valuable contribution in preparing the syllabus.

**Sd/-
Dr. B. Thamilmalaiselvi,
Chairperson, Professor & Head,
PG and Research Department of Microbiology,
Cauvery College for Women (Autonomous),
Tiruchirappalli-18.**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

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TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY



B.Sc., MICROBIOLOGY

SYLLABUS

2022 -2023 and Onwards



**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY**

VISION

Our vision is to encourage eminent research work through the conception of an attractive and vibrant environment to achieve goals of our department.

MISSION

- To impart relevant, ultimate, principle-oriented education and practical expertise in the field of Microbiology.
- To strive to provide quality education conjugated with innovative technology so as to be able to gain technical and educational expertise locally, nationally, internationally.
- Our prime focus is to enrich the ambitions of our students, staff and steer with constructive collaboration towards excellence.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc., MICROBIOLOGY PROGRAMME

PONO.	On completion of B.Sc., Microbiology, the students will be able to
PO1	Academic Excellence and Competence: Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in future.
PO2	Holistic and Social approach: Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable Environmental practices as well as social issues.
PO3	Professional ethics and Team Work: Explore professional responsibility through projects, internships, field trip/industrial visits and mentorship Programmes to transmit communication skills.
PO4	Critical and Scientific thinking: Equip training skills in Internships, Research Project to do higher studies in multidisciplinary path with higher level of specialization to become professionals of high-quality standards.
PO5	Social Responsibility with ethical values: Ensure ethical, social and holistic values in the minds of learners and attain ender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., MICROBIOLOGY

PSO NO.	Students of B.Sc., Microbiology will be able to	Pos Addressed
PSO1	Improve their knowledge on the basic concepts for retaining competence and confidence which enables them to develop interest in the new arena of Microbiology	PO1, PO5
PSO2	Acquire expertise in practical work within dependent equipment Handling skill along with collection and interpretation of scientific data	PO2, PO3
PSO3	Legitimize knowledge by emerging multiple aspects of current research.	PO3, PO5
PSO4	Pursue the importance of substantial original Research to meet the current and future expectation.	PO4, PO1
PSO5	Be aware of the ethical issues for the benefit of the society by adding skilled scientific work for across the country.	PO5, PO2



Cauvery College for Women (Autonomous)
PG & Research Department of Microbiology

B.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs.	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC) Tamil / other languages	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar-I	22ULH1						
			Basic French-I	22ULF1						
			History of Popular Tales Literature and Sanskrit Story	22ULS1						
	II	English Language Course- I(ELC)	Functional English for Effective Communication-I	22UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	General Microbiology	22UMB1CC1	5	5	3	25	75	100
				22UMB1CC1P	3	3	3	40	60	100
				22UMB1AC1	5	3	3	25	75	100
				22UMB1AC2P	3	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal-Universal Human Values	22UGVE	2	2	-	100	-	100
TOTAL					30	22				700
II	I	Language Course-II(LC)Tamil / Other languages	இடைக்கால இலக்கியமும் புதினமும்	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar-II	22ULH2						
			Basic French-II	22ULF2						
			Poetry, Textual Grammar and Alankara	22ULS2						
	II	English Language Course- II(ELC)	Functional English for Effective Communication-II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Microbial Physiology	22UMB2CC2	5	5	3	25	75	100
				22UMB2CC2P	3	3	3	40	60	100
				22UMB2CC3	3	3	3	25	75	100
				22UMB2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100

IV	Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100
Extra Credit Course		SWAYAM	As Per UGC Recommendation						
TOTAL				30	23				800

III	I	Language Course-III(LC) Tamil*/Other Languages*	காப்பியமும் நாடகமும்	22ULT3						
			Hindi Literature & Grammar-III	22ULH3	5	3	3	25	75	100
			Intermediate French-I	22ULF3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
	II	English Language Course-II(ELC)	Learning Grammar Through Literature-I	22UE3	6	3	3	25	75	100
	III	Core Course-IV(CC)	Virology	22UMB3CC4	6	6	3	25	75	100
		Core Practical – III(CP)	Virology (P)	22UMB3CC3P	3	3	3	40	60	100
		Second Allied Course-I (AC)	Biostatistics	22UMB3AC4	4	3	3	25	75	100
		Second Allied Course-II (AP)	Biostatistics (P)	22UMB3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course- I (GEC)	A. Mushroom Technology	22UMB3GEC1	2	2	3	25	75	100
B. Basic Tamil-I			22ULC3BT1							
C. Special Tamil-I			22ULC3ST1							
Extra Credit Course		SWAYAM	As Per UGC Recommendation							
TOTAL				30	23				700	

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course-IV (LC) Tamil*/Other Languages*	பண்டைய இலக்கியமும் உரைநடையும்	22ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Intermediate French-II	22ULF4						
			Drama, History of Drama Literature	22ULS4						
	II	English Language Course -IV(ELC)	Learning Grammar Through Literature-II	22UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Immunology	22UMB4CC5	6	6	3	25	75	100
		Core Practical -IV(CP)	Immunology (P)	22UMB4CC4P	4	4	3	40	60	100
		Second Allied Course-III (AC)	Bioinformatics	22UMB4AC6	4	3	3	25	75	100
		Internship	Internship	22UMB4INT	-	2	-	-	-	100
	IV	Generic Elective	A. Biofertilizer Technology	22UMB4GEC2	2	2	3	25	75	100
B. Basic Tamil-II			22ULC4BT2							

	Course- II (GEC)	C. Special Tamil-II	22ULC4ST2							
	Skill Enhancement Course-I(SEC)	Herbal Medicine (P)	22UMB4SEC1P	2	2	3	40	60	100	
	Extra Credit Course	SWAYAM	As Per UGC Recommendation							
			TOTAL	30	25					800

V	III	Core Course –VI(CC)	Medical Microbiology	22UMB5CC6	6	6	3	25	75	100
		Core Course -VII(CC)	Agricultural and Environmental Microbiology	22UMB5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Molecular Biology	22UMB5CC8	6	6	3	25	75	100
		Core Practical – V(CP)	Medical Microbiology, Agricultural and Environmental Microbiology and Molecular Biology (P)	22UMB5CC5P	3	3	3	40	60	100
		Discipline Specific Elective – I (DSE)	A. Organic Farming	22UMB5DSE1A	5	4	3	25	75	100
	B. Medical Parasitology		22UMB5DSE1B							
	C. Fundamentals of Botany and Zoology		22UMB5DSE1C							
	IV	Ability Enhancement Compulsory Course-IV(AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course –II(SEC)	Biofertilizer Technology (P)	22UMB5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM	As Per UGC Recommendation						
			TOTAL	30	29					700
VI	III	Core Course – IX(CC)	Fermentation Technology	22UMB6CC9	6	6	3	25	75	100
		Core Course –X(CC)	Food and Dairy Microbiology	22UMB6CC10	5	5	3	25	75	100
		Core Course –XI (CC)	Cyber security	22UGCS	5	4	3	25	75	100
		Core Practical – VI(CP)	Fermentation Technology and Food and Dairy Microbiology (P)	22UMB6CC6P	3	3	3	40	60	100
		Discipline Specific Elective – II (DSE)	A. Microbial Genetics	22UMB6DSE2A	5	4	3	25	75	100
			B. Microbial Biotechnology	22UMB6DSE2B						
	C. Biological Techniques		22UMB6DSE2C							
	Project	Project Work	22UMB6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	-	-	100
Extension activity			22UGEA	0	1	0	-	-	-	
			TOTAL	30	28					700
			GRANDTOTAL	180	150					4400

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory& Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

For Theory:

- a) The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 75 marks (i.e. 30 marks)

For Practical:

- a) The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- b) The passing minimum for End Semester Examinations shall be 40% out of 60 marks (i.e., 24 marks)

Internal Component (Theory)

Component	Marks
Quiz	10
Assignment & Seminar	10
CIA -I	05
Total	25

Internal Component (Practical)

Component	Marks
Record Note	10
Continuous Performance in Practical (Attendance and Observation)	15
CIA	15
	40

Question Paper Pattern for different courses +



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) TRICHY
PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY
B.SC., MICROBIOLOGY
Learning Outcome Based Curriculum Framework (CBCS-LOCF)
(For the candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total	
							Hrs.	Marks			
								Int	Ext		
I	I	Language Course I (LC) Tamil*/Other Languages*	இக்கால இலக்கியம்	22ULT1	6	3	3	25	75	100	
			Hindi Literature & Grammar-I	22ULH1							
			Basic French-I	22ULF1							
			History of Popular Tales, Literature and Sanskrit Story	22ULS1							
	II	English Language Course- I(ELC)	Functional English for Effective Communication-I	22UE1	6	3	3	25	75	100	
	III	Core Course – I(CC)	General Microbiology	General Microbiology	22UMB1CC1	5	5	3	25	75	100
				General Microbiology (P)	22UMB1CC1P	3	3	3	40	60	100
				Fundamentals of Biochemistry	22UMB1AC1	4	3	3	25	75	100
				Fundamentals of Biochemistry (P)	22UMB1AC2P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100	
Total					30	22				700	

Semester: I	Internal Marks : 25		External Marks : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UMB1CC1	GENERAL MICROBIOLOGY	CORE	5	5

Course Objective

- This subject aims to introduce the history and development of Microbiology. The contents of this course will help students understand history, biology of microorganisms, growth and control of microbes.
- Thus, the beginners are rightly exposed to foundation of Microbiology which would lead them towards progressive advancement of the subject.

Course Outcome and Cognitive level Mapping

CO Number	CO Statement	Cognitive level
CO 1	Remember and understand the Development of Microbiology	K1, K2
CO 2	Analyze the Size and Shape of Microorganisms using Microscope	K3
CO 3	Evaluate the knowledge about Bacteria and Viruses	K4
CO 4	Compare the various Preservation Methods for preserving Microbes.	K5
CO 5	Create the various applications of Extremophiles	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	History and Scope of Microbiology: Introduction- Definition, scope and Spontaneous generation vs. biogenesis. History of Microbiology- Domain and kingdom concepts, Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Flemming Role of microorganisms in fermentation, Germ	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

	theory of disease, Development of various microbiological techniques and golden era of microbiology. Microscopy: Principles and applications of bright field, dark field, phase contrast, fluorescent SEM and TEM.			
II	Structure of Bacteria : Difference between prokaryotic and eukaryotic microorganisms. Brief outline of Bergey's manual of systemic bacteriology. Structural organization of bacteria – Size, shape and arrangement of bacterial cells - Ultrastructure of a bacterial cell - cell wall, cell membrane, ribosomes, nucleoid, slime, capsule, flagella, fimbriae, spores, cysts, plasmid, mesosomes and cytoplasmic inclusions	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
III	Cellular and Acellular organisms: General characteristics and nature of Cellular and Acellular organisms- Archaeobacteria, Mycoplasma, Rickettsiae, Chlamydia, Spirochaetes, Actinobacteria, Protozoa, Algae, Fungi, lichens, Viruses, viroids and prions.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
IV	Pure culture techniques: Sterilization: Principles and methods – physical methods- moist heat, dry heat, filtration and media preparation. Cultivation of microbes- Types of culture media- Stab, slant, broth, semisolid, solid media. Aerobic and Anaerobic culture techniques- Pure culture techniques – Maintenance and preservation of microbes. Principles and types of staining– Simple, differential, Capsule staining.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
V	Extremophiles: Introduction to Extremophiles– Thermophiles, Psychrophiles, barophiles, Halophiles, Alkanophiles, Acidophiles, Methanogenesis and their applications.	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
VI	Self Study for Enrichment (Not to be included for External Examination) Microscopic operations, Criteria for Classification of Microorganisms, cellular organizations, Isolation and identification of Microorganisms, Cultivation methods for Extremophiles.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Dubey RC and Maheswari DK. (2015). *A Text Book of Microbiology*. 5th Edition. S Chand, New Delhi.
2. Ananthanarayan Paniker (2020). *A Text book of Microbiology*. 11th Edition. University Press. Singapore.
3. Madigan MT, Martinko JM, and Parker J. (2019). *Biology of Microorganisms*. 12th Edition, MacMillan Press. England.
4. Pelczar MJ, Chan ECS and Kreig NR. (2015). *Microbiology*, 5th edition. McGraw-Hill. Book Co. Singapore.
5. Atlas RA and Bartha R. (2019). *Microbial Ecology. Fundamentals and Application*. 4th edition Benjamin Cummings, New York.

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1. Prescott L.M, Harley, J.P. and Helin, D.A. (2017). *Microbiology*, 5th Edition. McGraw Hill.
2. Tortora GJ, Funke BR and Case CL. (2020). *Microbiology: An Introduction*. 9th Edition, Pearson Education, Singapore.
3. Black JG. (2018). *Microbiology-principles and explorations*, 6th edition. John Wiley and Sons, Inc. New York.
4. Moselio Schaechter and Joshua Leaderberg (2019). *The Desk encyclopedia of Microbiology*. 2nd edition. Elsevier Academic press, California.
5. Madigan MT, Martinko JM, and Parker J. (2019). *Biology of Microorganisms*, 12th Edition. MacMillan Press, England.

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1. <https://microbenotes.com/history-of-microbiology/>
2. <https://byjus.com/biology/prokaryotic-and-eukaryotic-cells/>
3. <https://byjus.com/biology/archaeobacteria/>
4. <https://thebiologynotes.com/sterilization-physical-and-chemical-methods/>
5. <https://microbenotes.com/microbiology-of-extreme-environments/>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

Dr. V. Aruna

Semester : I	InternalMarks:40		ExternalMarks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB1CC1P	GENERAL MICROBIOLOGY (P)	CORE PRACTICAL	3	3

Course Objective

- To enable the students to understand the basic knowledge of aseptic techniques preparation and sterilization of media, pure culture techniques
- To acquire adequate skill to handle microscope to visualize microbes.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CONumber	CO Statement	Cognitivelevel
CO1	Recall the safety practice in microbiological laboratory	K1
CO2	Demonstrate the accuracy of sterilization	K2
CO3	Develop skills to observe microbes using microscopes	K3
CO4	Competently prepare and cultivate bacteria, fungi and cyanobacteria using media	K3
CO5	Explain various pure culture techniques	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

1. Safety & Good laboratory practices
2. Basic concepts of Microscope and its operation
3. Principles and operations—Autoclave, Hot Air Oven, Incubators, Laminar Air Flow chamber, Filtration, colony counter, Centrifuge, pH meter, Colorimeter and Spectrophotometer
4. Cleaning and sterilization of glassware.
5. Preparation of culture media—solid, semi-solid and liquid.
6. Isolation of bacteria, fungi and cyanobacteria from soil and water
7. Enumeration of bacterial numbers by viable count (Plate count)
8. Pure culture techniques - Streak plate, Pour plate and Spread plate.
9. Test for motility of bacteria – Hanging Drop Method
10. Staining techniques – Simple staining, Gram's staining, Spore-staining, Capsular staining, LCB mount and Saline mount
11. Observation of permanent slides to study the structural characteristics of algae (*Anabaena*, *Nostoc*, *Spirulina*, *Oscillatoria*), fungi (*Pythium*, *Rhizopus*, *Saccharomyces*, *Penicillium*, *Aspergillus*, *Agaricus*) and protozoa (*Entamoeba histolytica* and *Plasmodium spp.*).

Reference Books

1. Bharti Arora, D.R. Arora (2020), *Practical Microbiology*, CBS Publishers & Distributors
2. Mudili J (2020), *Introductory Practical Microbiology*, Narosa Das S (2020), *Microbiology Practical Manual*, CBS Publishers
3. Saravanan R, D. Dhachinamoorthi, CH. MM. Prasada Rao, (2019), *A Hand book of Practical Microbiology*, LAP LAMBERT Academic Publishing.
4. Shukla Das and Rumpa Saha (2019). *Microbiology Practica lManual*, 1st Edition CBS Publishers and Distributors.
5. Amita Jain, Jyotsna Agarwal, Vimala Venkatesh (2018), *Microbiology Practical Manual*, 1st Edition, Elsevier India.
6. Cappuccino and Sherman (2016), *Microbiology–A Laboratory Manual*, 11th Edition, Dorling Kindersley (India) Pvt. Ltd., New Delhi.
7. R.C. Dubey, Dr. D.K. Maheswari (2010), *Practical Microbiology*, Kindle Edition

Web References

1. <https://unitedvrg.com/2019/03/28/microbiology-a-laboratory-manual-11th-edition-2016-pdf/>
2. <https://www.youtube.com/watch?v=hxausVA8a3E>
3. <https://www.youtube.com/watch?v=sxa46xKfIOY>
4. <https://www.youtube.com/watch?v=lu9CvIF20pc>
5. <https://study.com/learn/lesson/simple-differential-staining-techniques.html>
6. <https://www.youtube.com/watch?v=xjYdOcT6s1Y>
7. <https://bitesizebio.com/853/5-laboratory-sterilisation-methods/>
8. <https://www.youtube.com/watch?v=QqWcUzpzZgw>

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Dr. P. Bhuvaneshwari

Semester : I	InternalMarks:25		ExternalMarks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB1AC1	FUNDAMENTALS OF BIOCHEMISTRY	ALLIED	4	3

Course Objective

- To understand the structure, functions of various biomolecules and consequences of deviation from normal

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO1	Remember and understand the concept of macromolecules	K1,K2
CO2	Illustrate an idea about structure and function macromolecules	K2,K3
CO3	Categorize the sources of macromolecules	K4
CO4	Classify and relate properties o macromolecules	K3,K4
CO5	Recommend the daily allowances of vitamins and its significance	K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	2	2	3	2	3
CO2	3	3	2	3	3	2	2	3	3	3
CO3	2	3	3	2	3	3	3	2	3	3
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1”–Slight (Low) Correlation

“2” – Moderate (Medium)

Correlation“3”–Substantial (High) Correlation “-“indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIV ELEVEL
I	Carbohydrates: Definition, sources, classification-monosaccharide, disaccharide, oligosaccharide and Polysaccharide, biological significance, digestion and absorption of carbohydrates	12	CO1, CO2,CO3, CO4	K1,K2,K3,K4

II	Proteins: Definition, sources, classification and structure of proteins-structural and non-structural proteins, Amino acids–structure-classification-essential and non essential, protein and non-protein amino acids. Biological Significance of Proteins.	12	CO1, CO2,CO3, CO4	K1,K2,K3,K4
III	Lipids: Definition, Properties, Sources, Classification of lipids and fatty acids- saturated, unsaturated and polyunsaturated. Compound lipids - Structure and functions of phospholipids and glycolipids. Biological significance of lipids.	12	CO1, CO2,CO3, CO4	K1,K2,K3,K4
IV	Nucleicacids: Definition, structure–Nucleoside, Nucleotides, forms and functions of DNA. Types, structure and functions of RNA. Difference between DNA & RNA (mRNA, tRNA, rRNA).	12	CO1, CO2,CO3, CO4	K1,K2,K3,K4
V	Vitamins: Definition, sources, deficiency disorders and functions of Fat soluble vitamins (A, D, E and K) and Water soluble vitamins (B complex and C).	12	CO1, CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5
VI	Self Study for Enrichment (Not to be included for External Examination) Diabetesmellitus–BloodPlasmaprotein– Lipoprotein–Phosphodiesterbond– structureofvitamins.	-	CO1, CO2,CO3, CO4,CO5	K1,K2,K3,K4, K5

Text Books

1. AmbikaShanmugam(2016).*Fundamentals of Biochemistry for Medical Students*. 8th Edition, Wolters Kluwer (India) Pvt Ltd.
2. Rafi MD, (2014) *Textbook of Biochemistry for medical students*, 2nd edition, Universities Press, (India) Pvt. Ltd, Hyderabad, India.
3. Charlotte W Pratt and Sathyanarayana U and Chakrapani U (2013) *Biochemistry*, 4th edition, Elsevier publishers.
4. Deb AC (2011). *Fundamentals of Biochemistry*, 10th edition, New Central Book Agency (p) Ltd, London
5. Rajagopal G (2010). *Concise textbook of biochemistry*, 2nd edition, Ahuja Publishing House.

Reference Books

1. Lubert Stryer; Jeremy Berg; John Tymoczko; Gregory Gatto (2019). *Biochemistry*, 9th Edition. Macmillan Publication.
2. Denise R Ferrier, (2013) *Biochemistry*, 6th edition, LWW publishers.
 3. Reginald H Garrett and Charles M Grisham (2012). *Biochemistry*, 5th edition. Brooks Cole publishers.
4. Albert L Lehninger, David L Nelson and Michael M Cox, (2010). *Lehninger Principles of Biochemistry*, 2nd edition, Wiley publisher

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1. <https://www.slideshare.net/namarta28/monosaccharides>
2. <https://www.tuscany-diet.net/proteins/classification/#:~:text=egg%20yolk%20phosvitin.>
3. <http://www.Protein%20classification%20based%20on%20shape,two%20classes%3A%20Of%20fibrous%20and%20globular.>
4. <https://byjus.com/biology/lipids/#:~:text=There%20are%20two%20major%20types,than%20alcohol%20and%20fatty%20acids.>
5. <https://www.thoughtco.com/dna-versus-rna-608191>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.B.Thamilmaraiselvi

Semester:I	InternalMarks:40		ExternalMarks:60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB1AC2P	FUNDAMENTALS OF BIOCHEMISTRY (P)	ALLIED PRACTICAL	4	3

Course Objective

- This course enables the students to explore the basic biochemistry practical skills.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO1	Identify the carbohydrates, amino acids, proteins present in the given sample	K1
CO2	Interpret the amount of glucose present in the given sample by Anthrone method.	K2
CO3	Calculate the amount of amino acid present in the given sample by Ninhydrin method	K2
CO4	Analyse the amount of protein and cholesterol present in the given sample	K4
CO5	Evaluate the amount of DNA present in the given sample by Diphenylamine (DPA) method	K3

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	3	3	3	3	3
CO2	3	3	3	3	2	1	3	3	3	3
CO3	3	3	1	3	3	3	2	2	2	3
CO4	3	3	2	3	3	3	3	1	3	2
CO5	3	3	3	2	2	3	3	2	2	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

1. Qualitative analysis of carbohydrates, amino acids and proteins.
2. Quantitative estimation of Glucose by Anthrone Method
3. Quantitative estimation of Amino acids by Ninhydrin Method
4. Quantitative estimation of Protein by Lowry's Method
5. Quantitative estimation of Cholesterol by Jacks Method
6. Quantitative estimation of DNA by Diphenylamine (DPA)Method

Reference Books

1. Vasudevan and Sabir Kumar Doss(2022).*Practical Text book of Biochemistry for Medical students*
2. Damodaran Geetha K.(2016), *Practical Biochemistry*, JB brother medical publisher.
3. Ranjna Chawla.(2014). *Practical clinical Biochemistry*, JB brother medical publisher.
4. ManipalmanualofclinicalBiochemistry.2013,JB brother medical publisher.
5. Shawn O' Farrell and Ryan T Ranallo (2000). *Experiments in Biochemistry: A Hands onApproach-A manual for the undergraduate laboratory*, Thomson Learning, Inc., Australia.

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1. <https://www.youtube.com/watch?v=wmhmAESv72E>
2. <https://www.youtube.com/watch?v=VzYDk4t97Ok>
3. <https://www.youtube.com/watch?v=JdXbTWfOc18>
4. https://www.youtube.com/watch?v=2LiA_yNMIVs

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. B. Thamilmaraiselvi



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS) TRICHY
PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY
B.SC., MICROBIOLOGY

Learning Outcome Based Curriculum Framework (CBCS-LOCF)
(For the candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int.	Ext.	
II	I	Language Course II (LC) Tamil*/Other Languages*	இடைக்கால இலக்கியமும் புதினமும்	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar-II	22ULH2						
			Poetry, Grammar and Alankara	22ULS2						
			Basic French-II	22ULF2						
	II	English Language Course- II(ELC)	Functional English for Effective Communication-II	22UE2	6	3	3	25	75	100
	III	Core Course – II(CC)	Microbial Physiology	22UMB2CC2	5	5	3	25	75	100
		Core Practical - II (CP)	Microbial Physiology (P)	22UMB2CC2P	3	3	3	40	60	100
		Core Course – III (CC)	Microbial Diversity	22UMB2CC3	3	3	3	40	60	100
		First Allied Course- III (AC)	Applied Biochemistry	22UMB2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course -II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
Ability Enhancement Compulsory Course – III (AECC)		Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
		Extra Credit Course	SWAYAM	As Per UGC Recommendation						
Total					30	23				800

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB2CC2	MICROBIAL PHYSIOLOGY	CORE COURSE	5	5

Course Objective

- To provide basic knowledge nutritional requirements of microbes
- To understand microbial growth and its measurement
- To impart knowledge about carbohydrate and protein metabolism
- To learn the pathways and its importance

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO 1	State the Nutritional requirements of microorganisms and its uptake	K1, K2
CO 2	Explain different phases of growth and its assessment	K2, K3
CO 3	Describe the Carbohydrate metabolism	K4
CO 4	Illustrate the Protein Metabolism	K3, K4
CO 5	Compute the importance of Anaerobic Respiration and fermentation pathway	K5

Mapping of CO with PO and PSO

COS	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	3	3	2	2	3	2	3
CO2	3	3	2	3	3	2	2	3	3	3
CO3	2	3	3	2	3	3	3	2	3	3
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation
 “3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
 “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Nutrition: Nutritional requirement of microorganisms – micro and macro elements, nutritional classification (Autotrophs, heterotrophs, photoautotrophs, chemoautotrophs, chemolithotrophs, oligotrophs). Uptake of nutrients by the cell – Passive diffusion, Facilitated diffusion, Active transport and group translocation – Iron uptake.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Growth: Phases of Growth, Growth curve. Factors influencing the growth of microorganisms – temperature, pH, salt, Osmotic pressure, and radiations. Synchronous growth- continuous growth and Diauxic culture. Quantitative measurement of growth- Direct microscopic method, Direct plate count, membrane filter count, turbidometry and micrometry.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	Carbohydrate metabolism: Anabolism – photosynthesis – oxygenic – anoxygenic, synthesis of carbohydrate– catabolism of glucose – Embden Mayer– Hoff – Parnas pathway (EMB) – Pentose pathway, Entener- Doudoroff (ED) pathway, Kreb’s cycle (TCA) – Electron Transport System and ATP production. Respiration: Anaerobic Respiration – Nitrate, sulphate & Methane respiration – Fermentations – alcohol, mixed acid, lactic acid fermentation	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
IV	Protein metabolism – metabolic pathways of nitrogen utilization, synthesis of amino acids (Proline, glycine, threonine), peptides, proteins. Biosynthesis of bacterial cell wall.	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
V	Lipid metabolism – biosynthesis of saturated and unsaturated fatty acids and degradation of fatty acids - β Oxidation - Nucleic acid metabolism – biosynthesis and degradation of purines and pyrimidines.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Bacterial enzymes – classification – Enzymes of aerobic & anaerobic respiration – role of enzymes in metabolism of carbohydrate, protein and lipid.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text books

1. Dubey RC and Maheswari DK. (2015). A Text Book of Microbiology. 5th Edition. S Chand, New Delhi.
2. Ananthanarayan Paniker (2020). A Text book of Microbiology. 11th Edition. University Press. Singapore.
3. Madigan MT, Martinko JM, and Parker J.(2019). Biology of Microorganisms. 12th Edition, MacMillan Press. England.
4. Atlas RA and Bartha R.(2019). Microbial Ecology. Fundamentals and Application. 4th edition Benjamin Cummings, New York.
5. Pelczar MJ, Chan ECS and Kreig NR. (2015). Microbiology, 5th edition. McGraw-Hill. Book Co. Singapore.
6. Meenakumari S, Microbial Physiology (2006), Volume 1, MJP Publishers.
7. Alber G. Moat, John W. Foster , Michael P. Spector Microbial Physiology (2002), 4th Edition, Wiley-Liss.

Reference Books

1. Tortora GJ, Funke BR and Case CL.(2020). Microbiology: An Introduction. 9th Edition, Pearson Education, Singapore.
2. Black JG. (2018). Microbiology-principles and explorations, 6th edition. John Wiley and Sons, Inc. New York.
3. MoselioSchaechter and Joshua Leaderberg (2019). The Desk encyclopedia of Microbiology. 2nd edition. Elsevier Academic press, California.
4. Madigan MT, Martinko JM, and Parker J.(2019). Biology of Microorganisms, 12th Edition. MacMillan Press, England.
5. Michel Mandigan, Kelly S.Bender, Daniel buckley, W Mathew Sattley and David Stahl (2019) Borck biology of miccroorganisms 15th Edition, Pearson.
6. Prescott L.M, Harley,J.P. and Helin, D.A. (2017). Microbiology, 5th Edition. McGraw Hill.

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2. <https://biologydictionary.net/anaerobic-respiration/>
3. [https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_\(Kaiser\)/Unit_7%3A_Microbial_Genetics_and_Microbial_Metabolism/18%3A_Microbial_Metabolism/18.3%3A_Aerobic_Respiration](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Kaiser)/Unit_7%3A_Microbial_Genetics_and_Microbial_Metabolism/18%3A_Microbial_Metabolism/18.3%3A_Aerobic_Respiration)
4. [https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_\(LibreTexts\)/02%3A_Unit_II-_Bioenergetics_and_Metabolism/22%3A_Biosynthesis_of_Amino_Acids_Nucleotides_and_Related_Molecules/22.02%3A_Biosynthesis_of_Amino_Acids](https://bio.libretexts.org/Bookshelves/Biochemistry/Fundamentals_of_Biochemistry_(LibreTexts)/02%3A_Unit_II-_Bioenergetics_and_Metabolism/22%3A_Biosynthesis_of_Amino_Acids_Nucleotides_and_Related_Molecules/22.02%3A_Biosynthesis_of_Amino_Acids)
5. <https://www.youtube.com/watch?v=9CPIs-Qhg-M>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr. P.Bhuvaneswari

Semester: II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB2CC2P	MICROBIAL PHYSIOLOGY (P)	CORE PRACTICAL	3	3

Course Objective

- To enable the students to understand the basic knowledge of
- To acquire adequate skill to handle microscope to visualize microbes.

Course Outcomes and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO 1	Develop the skills to grow microbes in the laboratory	K1
CO 2	Illustrate effect of pH, temperature and salt on microbes	K2
CO 3	Measure the growth of microbial cell	K3
CO 4	Summarize biochemical test to identify the bacteria	K3
CO 5	Interpret the results of biochemical reaction by microbes	K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	3	2	2	2	3
CO2	3	2	3	3	2	3	2	2	3	3
CO3	3	3	3	2	3	3	3	3	3	2
CO4	3	3	2	3	2	3	2	2	3	2
CO5	3	3	3	2	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

1. Effect of pH on the growth of microbes
2. Effect of Temperature on the growth of microbes
3. Effect of salt on the growth of microbes
4. Determination of growth curve – spectrophotometric assay
5. Measurement of microbial cell by micrometry
6. Cultivation of anaerobes- Wrights tube method and McIntosh method
7. Oxidase test
8. Catalase test
9. Biochemical test -Indole test, Methyl Red test, Voges Proskauer test, Citrate Utilization test, Triple Sugar Iron test and Carbohydrate fermentation test

Reference Books

1. Bharti Arora, D.R. Arora (2020), *Practical Microbiology*, CBS Publishers & Distributors
2. Mudili J (2020), *Introductory Practical Microbiology*, NarosaDas S (2020), *Microbiology Practical Manual*, CBS Publishers
3. Saravanan R , D. Dhachinamoorthi , CH. MM. Prasada Rao , (2019), *A Handbook of Practical Microbiology*, LAP LAMBERT Academic Publishing.
4. Shukla Das and RumpaSaha (2019). *Microbiology Practical Manual*, 1st Edition CBS Publishers and Distributors.
5. Amita Jain , Jyotsna Agarwal , Vimala Venkatesh (2018), *Microbiology Practical Manual*, 1st Edition, Elsevier India.
6. Cappuccino and Sherman (2016), *Microbiology – A Laboratory Manual*, 11th Edition, Dorling Kindersley (India) Pvt. Ltd., New Delhi.
7. R.C.Dubey, Dr.D.K. Maheswari (2010), *Practical Microbiology*, Kindle Edition

Web References

1. <https://www.youtube.com/watch?v=yDAcepSV-tU>
2. <https://www.youtube.com/watch?v=qGkpW5W25K0>
3. <https://www.jove.com/v/10511/growth-curves-generating-growth-curves-using-colony-forming-units>
4. [https://bio.libretexts.org/Courses/North_Carolina_State_University/MB352_General_Microbiology_Laboratory_2021_\(Lee\)/07%3A_Microbial_Metabolism/7.01%3A_Introduction_to_Biochemical_Tests_Part_I](https://bio.libretexts.org/Courses/North_Carolina_State_University/MB352_General_Microbiology_Laboratory_2021_(Lee)/07%3A_Microbial_Metabolism/7.01%3A_Introduction_to_Biochemical_Tests_Part_I)
5. <https://www.youtube.com/watch?v=gkZ1CMKeP0w>
6. <https://microbiologyinfo.com/category/biochemical-test/>

Pedagogy

Power point presentations, Group Discussion, Quiz, Brain Storming Activity.

Course Designer

Dr.P.Bhuvaneshwari

SEMESTER: I	INTERNAL MARKS :25		EXTERNAL MARKS : 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs./Week	CREDITS
22UMB2CC3	MICROBIAL DIVERSITY	CORE COURSE	3	3

Course Objective

- To make the students to understand the different aspects to the classification of Prokaryotes and Eukaryotes.
- To make the students knowledgeable on the diversity of microbes.
- To in-depth an on knowledge on the different groups and species of microbes

Course Outcome and Cognitive level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive level
CO 1	Remember taxonomy and classification of microorganisms	K1, K2
CO 2	Apply in the field study about viruses classification	K3
CO 3	Analyze characteristics of different groups of microorganisms	K4
CO 4	Evaluate applications of diversified microorganisms	K5
CO 5	Create knowledge on microbial taxonomy and diversity	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	1	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	General Classification : General principles of classification of microorganisms – Haekel’s three	09	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.

	kingdom concept –Whittaker’s five kingdom concept – three domain concept of Carl Woese. Evolutionary methods in classification - International codes of nomenclature - Taxonomic approaches and Phylogeny			
II	Virology: Classification and salient features of viruses. Nature and properties in relation to classification. Structure and in-depth study of T ₄ , λ, M ₁₃ . Brief outline on virions and Prions.	09	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.
III	Bacteriology: Classification and salient features of bacteria according to Bergey’s manual of determinative bacteriology, In-depth study of <i>E. coli</i> , <i>Rhizobium</i> sp., <i>Rhodomicrobium</i> sp., Methane oxidizing bacteria <i>Methanobacteriasp.</i> ,	09	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.
IV	Phycology and Mycology : Classification and salient features of algae – nutrition, thallus characteristics and reproduction. Characteristics of green algae, diatoms, euglenoids, brown Rhodophyta, pyrrophyta. Economic importance of algae. Principles and outline classification of fungi: <i>Myxomycetes</i> , <i>Ascomycetes</i> , <i>Basidiomycetes</i> , <i>Deuteromycetes</i> , <i>Zygomycetes</i> , <i>Acrasiomycete</i> sand <i>Oomycetes</i> . In-depth study of <i>Aspergillus</i> sp., <i>Candida</i> sp., <i>Mucor</i> sp. Economic importance of fungi.	09	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.
V	Protozoology : Principles and outline classification of protozoa: Sarcodina, Mastigophora, Ciliata and Sporozoa. Structure and in-depth study of <i>Entamoebahistoltytica</i> and <i>Plasmodium vivax</i> .	09	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.
VI	Self Study Enrichment (Not to be included for External Examination) General Classification of Microbes, taxonomy and diversity of different	-	CO1,CO2, CO3,CO4, CO5.	K1, K2, K3, K4, K5.

	microorganisms, execute field projects on the diversity of microorganisms.			
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Text Books

1. Pelczar, Jr., Michael, E. C. S. Chan and Noel Kreig. (2000). Microbiology. V Ed. Tata McGraw Hill Book Company.
2. Alexopoulos, C.J. and Mims, C.W. (1979). Introductory Mycology, John Wiley, New York.
3. Lansing M. Prescott, John P. Harley and Donald A. Klein. 2002. Microbiology. V Ed. WCB/McGraw Hill Company. pp: 335 to 553.
4. John G. Holt. 1994. Bergey's Manual of Determinative Bacteriology. Lippincott Williams and Wilkins. Pp: 351-352; 597-724.
5. Dubey H. C. 1978. A Textbook of Fungi, Bacteria and Viruses. Vikaas Publishing House Ltd. Ltd. Pp: 1-341.

Reference Books

1. Jeffery C. Pommerville (2016). Alcamo's Fundamentals of Microbiology (Third Edition). Jones and Bartlett Learning. LLC, Burlington, MA 01803.
2. HansG. Schlegel. 2012. General Microbiology. VII Ed. Cambridge

Web Reference

1. <http://www.microbiologyonline.org.uk/links.html>
2. <http://www.bac.wise.edi/microtextbook/index.php>
3. <http://www.microbeworld.org.uk>
4. <http://www.staff.ncl.ac.uk/n.y.morris/lectures/class2007.html>

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designer

Dr.V.Aruna

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UMB2AC3	APPLIED BIOCHEMISTRY	FIRST ALLIED COURSE	4	3

Course objective

- To know about the Types of Blood cells, composition, function, deficiency diseases of RBC and WBC.
- To enable the students to know about the structural features of plasma membrane, cellular transport mechanisms with specific examples.
- To know about the Endocrine glands and its structure, classification of Hormones and its biosynthesis, functions and deficiency diseases.
- Acquire the knowledge about the structure and function of plant hormones and secondary metabolites-Alkaloids and flavonoids.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO	CO Statement	
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Number		Cognitive level
CO 1	Illustrate the basic Concept of Blood and its components, Deficiency Diseases	K2
CO 2	Explain the various models of cell Membrane and transport mechanisms	K2
CO 3	List out the Endocrine Glands and their hormones with deficiency diseases	K3
CO 4	Compare the Plant pigments with their biosynthesis and significance	K4
CO 5	Determine the structure of Plant hormones with its structure and function	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	3	2	3	2	2	3
CO2	2	2	3	2	2	3	2	3	3	3
CO3	3	2	1	3	2	2	2	3	2	2
CO4	2	2	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	2	3	2	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	CONGNITIVE LEVEL
I	Haematology: Types of Blood cells – origin - Composition characterization and coagulation- RBC –Formation – Haemoglobin - Structure and function – Deficiency diseases – Anaemia – Types – WBC – Types – Structure and function – Role in immunity – Leukopenia	12	CO1, CO2 CO3, CO4	K1,K2,K3,K4
II	Cytochemistry – structure and biochemical composition of plasma membrane – fluid mosaic model, Trilaminarmodel. Transport mechanisms –Active, Passive and Facilitated diffusion- Uni, sym and antiports – Na ⁺ - K ⁺ ATPase and	12	CO2,CO3, CO4,CO5	K2,.K3,K4,K5

	mitochondrial Calcium transport			
III	Endocrine glands – pituitary, thyroids, parathyroid, pancreas, adrenal, testis and ovary. Hormones – Definition – classification –protein hormone, steroid hormones, functions, regulations, diseases associated with deficiency of hormones.	12	CO1,CO3, CO4,CO5	K1,K3,K4,K5
IV	Structure and functions of plant hormones - Auxins, Gibberellin, Cytokinin and Absciscic acid.	12	CO1,CO2, CO3,C05	K2,K3,K4,K5
V	Plant pigments – chlorophyll, carotenoids- astaxanthin, Phycobilins and anthocyanin structure - Biosynthesis - functions	12	CO1,CO2,C O3,C04	K1,K3,K4,K5
VI	Self Study for Enrichment (Not to be included for End Semester Examination) Hemophilia-Leucocytosis- Polycythemia-Thalassemia- Van willebrand disease	-	CO1, CO2, CO3, C04	K1, K3, K4, K5

Text Books

1. William, J.Marshall and Stephan, K.Bangert.2014. 3rd Edition. Clinical Biochemistry – Metabolic and Clinical Aspects – Churchill Livingston, New York.
2. Ambika Shanmugam.2016. Biochemistry for Medical Students.8th Edition. Wolters Kluwer India Pvt. Ltd.
3. Satyanarayana.U. 2020.Biochemistry.5th Edition. Elsevier. RELX India pvt. ltd,
4. Seema Pavgi Upadhye.2020. Textbook of Biochemistry.4th Edition. Dreamtech Press.
5. Harper's.2018. Illustrated Biochemistry.31st Edition. McGraw Hill / Medical Publishers.

References

1. Stryer, L.1995.Biochemistry. 4th Edition. W.H. Freeman and Company, New York.
2. Dinesh puri.2020. Textbook of Medical Biochemistry.4th Edition. Elsevier India
3. Donald voet and Judith voet.1990. Biochemistry. John Wiley and Sons, New York.
4. Hubert, Stryer, 1995. Biochemistry – Freeman and Company, New York.
5. Dawn, B.Markus, 1994. Biochemistry.Harwal Publishing, New York.

Web References

1. <https://byjus.com/neet/plant-hormones/>
2. <https://www.hopkinsmedicine.org/health/conditions-and-diseases/hormones-and-the-endocrine-system>
3. <https://byjus.com/neet/types-of-blood-cells-notes/>

Pedagogy

Power point presentations, Group Discussion, Brain Storming Activity.

Course Designer

Dr.N.Pushpa

Semester : II	Internal Marks: 100			
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UGEVS	ENVIRONMENTAL STUDIES	ABILITY ENHANCEMENT COMPULSORY COURSE	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K1, K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classify various types of ecosystem with its structure and function.	K2, K3
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment and explain protection acts	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1, CO2, CO3, CO4	K1, K2, K3,
II	Natural Resources: Renewable and non-renewable resources: Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies. Land resources: Land as resources, land degradation, man induced Landslides, soil erosion and desertification. Role of an individual in conservation of natural resources.	06	CO1, CO2, CO3, CO4	K1, K2, K3
III	Ecosystems Concept, Structure and function of an ecosystem. Producers, consumers and decomposers Energy flow in the ecosystem and Ecological succession. Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem:-Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)	06	CO1, CO2, CO3, CO4	K1, K2, K3

IV	<p>Biodiversity and Environmental Pollution Introduction, types and value of biodiversity. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Definition, Causes, effects and control measures of:</p> <ol style="list-style-type: none"> a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise pollution e. Nuclear hazards <p>Solid waste Management: Causes, effects and control measures of urban and industrial wastes. E-Waste Management: Sources and Types of E-waste. Effect of E-waste on environment and human body. Disposal of E-waste, Advantages of Recycling E-waste. Role of an individual in prevention of pollution. Disaster management: floods, earthquake, cyclone and landslides.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	<p>Social Issues and the Environment Water conservation, rain water harvesting, watershed management. Climate change, global warming, acid rain, ozone layer depletion, Wasteland reclamation. Environment Protection Act Wildlife Protection Act. Forest Conservation Act. Population explosion – Family Welfare Programmes Human Rights - Value Education. HIV/ AIDS - Women and Child Welfare. Role of Information Technology in Environment and human health.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	Self-Study for Enrichment (Not to be included for End Semester Examination) Global warming – climate change – importance of ozone – Effects of ozone depletion. Biogeography – history, ecology and conservation. International laws and policy	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
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References

1. Beard, J.M. 2013. Environmental Chemistry in Society (2nd edition). CRC Press.
2. Girard, J. 2013. Principles of Environmental Chemistry (3rd edition). Jones & Bartlett.
3. Brebbia, C.A. 2013. Water Resources Management VII. WIT Press.
4. Pandit, M.K. & Kumar, V. 2013. Land use and conservation challenges in Himalaya: Past, present and future. In: Sodhi, N.S., Gibson, L. & Raven, P.H. Conservation Biology: Voices from the Tropics. pp. 123-133. Wiley-Blackwell, Oxford, UK (file:///Users/mkpandit/Downloads/Raven%20et%20al.%202013.%20CB%20Voices%20from%20Tropics%20(2).pdf) .
5. Hites, R.A. 2012. Elements of Environmental Chemistry (2nd edition). Wiley & Sons.
6. Harnung, S.E. & Johnson, M.S. 2012. Chemistry and the Environment. Cambridge University Press.
7. Boeker, E. & Grondelle, R. 2011. Environmental Physics: Sustainable Energy and Climate Change. Wiley.
8. Forinash, K. 2010. Foundation of Environmental Physics. Island Press.
9. Evans, G.G. & Furlong, J. 2010. Environmental Biotechnology: Theory and Application (2nd edition). Wiley-Blackwell Publications.
10. Williams, D. M., Ebach, M.C. 2008. Foundations of Systematics and Biogeography. Springer
11. Pani, B. 2007. Textbook of Environmental Chemistry. IK international Publishing House.
12. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.B.Thamilmaraiselvi

Assessment Rubrics for 100 Marks

1. Documentary (or) Poster Presentation (or) Elocution-25 Marks
2. Quiz (or) MCQ Test-25 Marks
3. Album Making (or) Case study on a topic (or) Field Visit -25 Marks
4. Essay Writing (or) Assignment (Minimum 10 pages) -25 Marks

There will be no End Semester Examination for this course. However, the subject teacher will evaluate the above mentioned components based on the performance of the students and submit the marks out of 100 (in the format to be supplied by the COE) with the approval of the concerned Head of the Department to the COE along with CIA marks of other courses.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A' Grade by NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY



M.Sc., MICROBIOLOGY

SYLLABUS

2022 -2023 and Onwards



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MICROBIOLOGY

VISION

Our vision is to encourage eminent research work through the conception of an attractive and vibrant environment to achieve goals of our department.

MISSION

- To impart relevant, ultimate, principle-oriented education and practical expertise in the field of Microbiology.
- To strive to provide quality education conjugated with innovative technology so as to be able to gain technical and educational expertise locally, nationally, internationally.
- Our prime focus is to enrich the ambitions of our students, staff and steer with constructive collaboration towards excellence.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc., Microbiology PROGRAMME

PO NO	On completion of M.Sc., Microbiology, the students will be able to
PO1	Scientific Management and Career Opportunities: Master the scientific and applied aspects of the subject for employment opportunities.
PO2	Explore Creativity and Intelligence: Employ novel ideas with conceptual thinking to secure self-discipline and independence to foster scientific attitude by exploration of Science.
PO3	Team Building and Scientific Temperament: Inculcate training, internships and team spirit with leadership skills through academic projects and transmit complex scientific and technical information and contribute to the scientific community.
PO4	Innovative Learning and Technological Advancement: Perceive research in the specialized areas and to engage in life-long learning to keep pace with emerging trends in academics, research and technology.
PO5	Personality Development with Social Responsibility: Achieve ethical, social and holistic values with social responsibility to develop a healthy life.

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc., MICROBIOLOGY

PSO NO.	Students of M.Sc., Microbiology will be able to	POs Addressed
PSO 1	Understand the applied sciences to engage them life long learning to foster their successful carrier and educational goals.	PO1 PO5
PSO 2	Focus perceptive in the subject of Microbiology to apply its principles and its applications by adding broad range of scientific knowledge.	PO2 PO3
PSO 3	Acquire contextual knowledge on basis and modern concepts in current areas with contemporary technologies and multidisciplinary domains	PO3 PO4
PSO 4	Instill to work independently identify appropriate resources; enable individual, institutional and national values to understand the impact of innovation and applications.	PO4 PO1
PSO 5	Ability to imbibe moral and ethical values to formulate effective research grants and experimental designs	PO5 PO2



Cauvery College for Women (Autonomous), Trichy-18

PG & Research Department of Microbiology

M.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)

(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Title	Course Code	Inst./ Hrs/Week	Credit	Hrs	Marks		Total
							Int.	Ext.	
I	Core Course– I (CC)	Essentials of Microbiology	22PMB1CC1	6	5	3	25	75	100
	Core Course– II (CC)	Biological Macromolecules	22PMB1CC2	6	5	3	25	75	100
	Core Course – III (CC)	Clinical Virology	22PMB1CC3	6	5	3	25	75	100
	Core Practical–I (CP)	Essentials of Microbiology, Biological Macromolecules and Clinical Virology (P)	22PMB1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course – I(DSE)	A. Biological Techniques	22PMB1DSE1A	6	3	3	25	75	100
		B. Organic Farming	22PMB1DSE1B						
C. Microbial Cytology		22PMB1DSE1C							
TOTAL				30	23	-	-	-	500
15 Days INTERNSHIP during Semester Holidays									
II	Core Course- IV (CC)	Bacteriology and Mycology	22PMB2CC4	6	5	3	25	75	100
	Core Course – V(CC)	Immunology and Immunotechnology	22PMB2CC5	6	5	3	25	75	100
	Core Choice Course I (CCC)	A. Microbial Metabolism	22PMB2CCC1A	6	4	3	25	75	100
		B. Environmental and Agricultural Microbiology	22PMB2CCC1B						
		C. Microbial Ecology	22PMB2CCC1C						
	Core Practical–II (CP)	Bacteriology ,Mycology,Immunology and Immuno technology (P)	22PMB2CC2P	6	5	3	40	60	100
Discipline Specific Elective Course – II (DSE)	A. Biofertilizer Technology	22PMB2DSE2A	6	3	3	25	75	100	
	B. Public Health Microbiology	22PMB2DSE2B							
	C. Marine Microbiology	22PMB2DSE2C							

	Internship	Internship	22PMB2INT	-	2	-	-	100	100
	Extra Credits Course	SWAYAM	As Per UGC Recommendation						
	TOTAL			30	24	-	-	-	600
III	Core Course-VI (CC)	Molecular Biology and Microbial Genetics	22PMB3CC6	6	5	3	25	75	100
	Core Course-VII(CC)	Food and Dairy Microbiology	22PMB3CC7	6	5	3	25	75	100
	Chore Choice Course- II(CCC)	A. Cyber security	22PGCS3CCC2A	5	4	3	25	75	100
		B. Microbial Gene Technology	22PMB3CCC2B						
		C. Biosafety and Intellectual Property Rights	22PMB3CCC2C						
	Core Practical-III (CP)	Molecular Biology and Microbial Genetics (P)	22PMB3CC3P	6	5	3	40	60	100
	Discipline Specific Elective Course – III (DSE)	A. Microbiology for Competitive Examination	22PMB3DSE3A	4	3	3	25	75	100
		B. Food Adulteration	22PMB3DSE3B						
		C. Biomedical Laboratory Technology	22PMB3DSE3C						
	Generic Elective Course - I (GEC)	Food Quality Testing	22PMB3GEC1	3	2	3	25	75	100
Extra Credit Course	SWAYAM	As per UGC Recommendation							
	TOTAL			30	24	-	-	-	600
IV	Core Course – VIII (CC)	Bioprocess Technology	22PMB4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Bioinformatics and Biostatistics	22PMB4CCC3A	6	4	3	25	75	100
		B. Computational Biology	22PMB4CCC3B						
		C. Microbial Nanotechnology	22PMB4CCC3C						
	Core Practical-IV (CP)	Bioprocess Technology (P)	22PMB4CC4P	6	5	3	40	60	100
	Generic Elective Course -II (GEC)	Entrepreneurial Microbiology	22PMB4GEC2	3	2	3	25	75	100
	Project	Project Work	22PMB4PW	9	5	-	-	100	100
	TOTAL			30	21	-	-	-	500
	GRAND TOTAL			120	92	-	-	-	2200

Courses & Credits for PG Science Programmes

Sl. No	Courses	No of Courses	No of Credits	Marks
1.	Core Course – (CC)	08	40	800
2.	Core Choice Course– (CCC)	3	12	300
3.	Core Practical-(CP)	4	20	400
4.	Discipline Specific Elective- (DSE)	3	9	300
5.	Generic Elective Course - (GEC)	2	4	200
6.	Project	1	5	100
7.	Internship	1	2	100
	Total	22	92	2200

The internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

Separate passing minimum is prescribed for Internal and External

For Theory:

- The passing minimum for CIA shall be 40% out of 25 marks (i.e. 10 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 75marks (i.e. 30 mark
- The passing minimum not less than 50% in the aggregate.

For Practical:

- The passing minimum for CIA shall be 40% out of 40 marks (i.e. 16 marks)
- The passing minimum for End Semester Examinations shall be 40% out of 60marks (i.e. 24 mark
- The passing minimum not less than 50% in the aggregate.

For PROJECT:

Marks for Dissertation: 80 Marks

Marks for Viva Voce: 20 Marks

Total Marks: 100 Marks



Cauvery College for Women (Autonomous), Trichy
PG & Research Department of Microbiology
M.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)

(For the candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Course	Title	Course Code	Inst./ Hrs/Week	Credits	Exam			Total
						Hrs	Marks		
							Int.	Ext.	
I	Core Course – I (CC)	Essentials of Microbiology	22PMB1CC1	6	5	3	25	75	100
	Core Course – II (CC)	Biological Macromolecules	22PMB1CC2	6	5	3	25	75	100
	Core Course – III(CC)	Clinical Virology	22PMB1CC3	6	5	3	25	75	100
	Core Practical –I (CP)	Essentials of Microbiology, Biological Macromolecules and Clinical Virology (P)	22PMB1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course – I (DSE)	A. Biological Techniques B. Organic Farming C. Microbial Cytology	22PMB1DSE1A 22PMB1DSE1B 22PMB1DSE1C	6	3	3	25	75	100
Total				30	23	-	-	-	500

Semester: I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB1CC1	ESSENTIALS OF MICROBIOLOGY	CORE COURSE	6	5

Course Objective

To enable the students to understand the basic knowledge in Microbiology.

Prerequisites

Basic knowledge and concepts of microbiology.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember and understand the scope, history and basics of microbiology	K1,K2
CO2	Analyze the principles of Microscopy and able to understand the characteristics of different microbes	K1,K2,K3
CO3	Locate and classify and bacteria, fungi, algae and virus	K2,K4
CO4	Explain Microbial growth and recall methods of reproduction	K1,K5
CO5	Construct and revise cultivation and preservation methods of microbes	K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	2	3	3	2
CO2	2	2	2	2	2	3	2	3	2	2
CO3	2	3	1	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

1- Slight (Low) correlation
3- Substantial (High) correlation

2- Moderate(Medium) correlation
“-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	History and Scope of Microbiology, Classification systems– Phenetic, phylogenetic and numerical. Domain and	18	CO1, CO2, CO3	K1, K2, K3,

	kingdom concept - Haeckel's three kingdom concept, Whittaker's five kingdom concept, Carl Woese three domain system, Cavalier - smith eight kingdom concept. Bacterial classification(outline)according to Bergey's manual of systemic Bacteriology.			K4
II	Principles of microscopy. Compound microscope (Monocular and Binocular microscopes) – construction and function of parts, ray diagram of path of light, objectives, oculars, condensers, sources of illumination and uses. Dark field, Phase contrast and Fluorescence microscopes, Confocal microscopes, Atomic Force Microscope - principle, construction, ray diagram and applications - Electron microscopy – TEM and SEM – principle, construction, ray diagram and uses.	18	CO1, CO2	K1, K2, K3
III	Study of bacteria: Size, shape and arrangement of bacterial cells. Structures external to cell wall – capsule, slime layer, flagella, pili, fimbriae, stalks, prosthecae. Cell wall – gram positive and gram negative. Structures internal to cell wall – cell membrane , cytoplasm , cytoplasmic inclusions , genome, spores and cysts. Reproduction in bacteria: a) Binary fission <i>E coli</i> , <i>Bacillus</i> and <i>Streptococcus</i> b) Other methods – Budding, Fragmentation, Prostheca, Multiple fission.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	General characteristics, Classification, Structure and Reproduction of Algae: <i>Chlorophyta</i> (Green algae), <i>Diatoms</i> , <i>Rhodophyta</i> (Red algae), Fungi: Cell wall – chemical composition and functions, membranes and their functions, nutritional strategies of fungi. Structure and life cycle of fungi <i>Ascomycetes</i> (<i>Aspergillus</i>), <i>Zygomycetes</i> (<i>Mucor</i>), <i>Basidiomycetes</i> (<i>Agaricus</i>). Discovery, distinctive properties, morphology and ultra-structure of Virus, Classification of virus .	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
V	Microbial growth - culture media - isolation of pure culture. Growth curve: Diauxy - continuous culture – chemostat – turbidostat - synchronized growth. Measurement of microbial growth – Total cell count method - viable cell count method and biomass determination - dry weight – wet weight – protein – Kjeldhal nitrogen – chlorophyll. Growth phases – kinetics – asynchronous – synchronous - batch – continuous culture.	18	CO1, CO4, CO5	K1, K2, K4, K5

	Factors affecting growth (pH, salinity, temperature, light, etc). Microbial growth control - Physical and chemical methods – sterilization and disinfection. Maintenance and preservation of microorganism			
VI	Self Study for Enrichment (Not included for End Semester Examinations) Nomenclature and modern methods of Bacterial taxonomy, Micrometry, Gaint bacteria, Cultivation of virus and Protozoa, Bacterial nutrition.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Dave Wessner , Christine Dupont , Trevor Charles , Josh Neufeld.(2020).Microbiology.Wiley.
2. BhagwanRekadwad. (2020).Microbial Systematics: Taxonomy, Microbial Ecology, Diversity. CRC Press.
3. Joan L. Slonczewski , John W. Foster , Erik R. Zinser.(2020).Microbiology: An Evolving Science. W. W. Norton & Company.
4. Michael J. LeBoffe, Burton E. Pierce. (2019).Microbiology: Laboratory Theory & Application, 1st Edition. Morton Publishing Company.
5. Gerard Tortora , Berdell Funke , Christine Case. (2018).Microbiology: An Introduction, 4th Edition,Pearson.

Reference Books

1. Gerard Tortora , Berdell Funke , Christine Case, Derek Weber, Warner Bair . (2020).Microbiology: An Introduction, 12th Edition.Pearson.
2. Barry Chess.(2020).Talaro's Foundations in Microbiology: Basic Principles, 7th Edition.McGraw Hill.
3. Lourdes Norman-McKay .(2018).Microbiology: Basic and Clinical Principle, 1st Edition .Pearson.
4. Kathleen Park Talaro , Barry Chess. (2017).Foundations in Microbiology, 7th Edition. McGraw Hill.
5. PrescottL.M,Harley,J.P.andHelin,D.A. (2017).Microbiology, 5th Edition. McGraw Hill.

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1. <https://microbenotes.com/category/basic-microbiology/>
2. <https://microbiologyinfo.com/>
3. [https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_\(Kaiser\)/Unit_1%3A_Introduction_to_Microbiology_and_Prokaryotic_Cell_Anatomy/1%3A_Fundamentals_of_Microbiology](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(Kaiser)/Unit_1%3A_Introduction_to_Microbiology_and_Prokaryotic_Cell_Anatomy/1%3A_Fundamentals_of_Microbiology)
4. <https://www.biologydiscussion.com/notes/microbiology-notes/notes-microbiology-biology/34235>
5. <https://www.britannica.com/science/microbiology>

Pedagogy

Chalk and talk, Quiz, Assignments, Group Discussion, Demo and PPT

Course Designer

Dr.P.F.Steffi

Semester: I	Internal Marks:25	External Marks:75		
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/ Week	CREDITS
22PMB1CC2	BIOLOGICAL MACROMOLECULES	CORE COURSE	6	5

Course objective

- To provide knowledge about cell, it's structure and function
- To understand the metabolic pathways of various macromolecules.
- To know about the basic concepts of thermodynamics, chemical reactions and buffers
- To illustrate the structure, function, kinetics and inhibition of enzymes

Prerequisite

Basic understanding of cell and its functions, biological macromolecules.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember and understand the basic structure of cell and it's various components	K1,K2
CO2	Analyze and understand the basic concepts of enzyme and it's catalysis	K2,K3
CO3	Categorize the Various types of Macro molecules examine their structure, properties & Function	K3,K4
CO4	Explain the basic concepts of thermodynamics and list out the various types of transport mechanisms	K4,K5
CO5	Discuss the various metabolic pathways and interpret the ATP Production and regulation	K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	3	2	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

"1" – Slight (Low) Correlation

"3" – Substantial (High) Correlation

"2" – Moderate (Medium) Correlation

"-" indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Cell and its function-Structural organization and function of bacterial, animal and plant cell-Nucleus, Cytoplasm, Mitochondria, Golgi apparatus, Lysosomes, Ribosomes Endoplasmic reticulum. Various specialized components of microorganisms-Pili,Fimbriae,Cilia,Flagella, S-layer,Magnetosomes-their structure and function. Cell division-Mitosis,Meiosis	18	CO1, CO2, CO3	K1, K2, K3
II	Enzymes-Definition –Classification –specificity-active site-Emil fisher and koshland Model for the mechanism of enzyme action, Enzyme kinetics:Michaelis–Menton equation for simple enzymes-Factors affecting enzyme activity. Enzyme inhibition- Competitive, Non competitive and Uncompetitive. Isozymes-coenzymes- Biological significance of enzymes	18	CO1,CO2	K1, K2, K3, K4
III	Macromolecules. Nucleic acid - properties,biosynthesis of purines and pyrimidines - Structure of DNA and RNA.Types of RNA. Proteins -classification - primary-secondary-tertiary - quaternary and three dimensional structure of proteins.Synthesis of proteins.Aminoacids-Essential and Non Essential-Carbohydrates-mono,di,oligo and polysaccharides. Lipids and biomolecules: Fatty acids, properties, -oxidation	18	CO1,CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Bioenergetics –Laws of thermodynamics,strategy of energy production in the cell. Oxidation -reduction reactions,coupled reactions and group transfer. Biological energy transducers-structural features of biomembranes, transport, free energy and spontaneity of reaction, G , G° , G' and equilibrium.Basic concepts of acids,bases,pH and buffer	18	CO1, CO3, CO4	K1, K2, K3, K4, K5
V	Basic concepts of metabolism - catabolic principles and break down of carbohydrates-Glycolysis-EMP and Entnerdoudroff pathway,TCA cycle and HMP shunt. Lipids-Types of oxidation-proteins- Deamination,Transamination,Decarboxylation and Transmethylation- Nucleicacids – Purine and pyrimidine catabolism-significance	18	CO1, CO3, CO5	K1, K2, K3 ,K5
VI	Self study for Enrichment (Not included for End Semester Examinations) Cell cycle, Allosteric enzymes, Biosynthesis of cholesterol, Biological buffer system –Types and functions, ATP production	-	CO1, CO2, CO3, CO4	K2, K3, K4, K5

Text Books

1. Amit Kumar Nayak, Amal Kumar Dhara, Dilipkumar Pal (2021) *Biological Macromolecules Bioactivity and Biomedical Applications*. 1st Edition. Elsevier Inc.
2. Rene Crester Kratz, (2020) *Molecular & Cell Biology* 2nd edition dummies
3. Jeremy M Berg, John L Tymoczko and Lubert Stryer., (2002) *Biochemistry* 5th edition W.H. Freeman and company, New York
4. Freifelder D (2004) *Molecular Biology*, 4th Edition Narosa Publishing House, New Delhi

Reference Books

1. David E. Metzler and Carol M Metzler (2001) *Biochemistry - The chemical reactions of living cells - Volland* 2nd edition Harcourt/Academic press, New York
2. Lehninger, Albert L, David L Nelson and Michael M Cox. (2021) *Lehninger Principles of Biochemistry*. New York: 8th Edition Worth Publishers.
3. Stryer L, Berg J M and Tymoczko J L (2002) *Biochemistry* 5th edition. New York W.H. Freeman.
4. Thomas M Devlin. A. (2002) *Textbook of Biochemistry with clinical correlations*, 5th edition. John Wiley and sons, Inc., publication, New York
5. Rafi MD (2014) *Textbook of Biochemistry for medical students*, 2nd edition Universities Press, (India) Pvt. Ltd, Hyderabad, India

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1. [https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_\(Boundless\)/03%3A_](https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(Boundless)/03%3A_General_Biology_(Boundless)/03%3A_)
2. <https://www.youtube.com/watch?v=h-z9-9OOWC4>
3. <https://www.youtube.com/watch?v=-FQmAnmLZtE>
4. <https://www.youtube.com/watch?v=ok9esggzN18>
5. <https://www.youtube.com/watch?v=PYH63o10iTE>
6. <https://www.youtube.com/watch?v=VigpwmH7E3M>
7. https://www.youtube.com/watch?v=_zm_DyD6FJ0
8. <https://www.youtube.com/watch?v=VGHD9e3yRIU>
9. https://www.youtube.com/watch?v=2Jgb_DpaQhM
10. <https://www.youtube.com/watch?v=NNASRkIU5Fw>
11. <https://www.youtube.com/watch?v=qVAvmieRM1E>
12. <https://www.youtube.com/watch?v=Gh2P5CmCC0M>

Pedagogy

Chalk and talk, Quiz, Assignments, Group Discussion, Demo and PPT

Course Designer

Dr. N. Pushpa

Semester: I	InternalMarks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB1CC3	CLINICAL VIROLOGY	CORE COURSE	6	5

Course Objective

- To impart and explain the students with the advanced knowledge of the characteristics of Clinically important viruses with the focus on the General characters, Cultivation, Pathogenesis, Lab diagnosis, Prophylaxis, and Treatment of the disease.

Prerequisites

Basic Understanding of Etiology and Diagnostic Management of Animal Viruses.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Describe General Characters and Classification of viruses	K1,K2,K3
CO2	Aware different Diagnostic methods adopted for viruses	K2,K3,K4
CO3	Understand the replicative cycles of Viruses	K2,K3, K4,K5
CO4	Analyze the pathogenesis and symptoms of Viruses	K3,K4, K5,K6
CO5	Examine and Categorize different types of preventive measures Of Viruses	K3,K4, K5,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	3	3
CO2	3	3	3	3	3	1	3	3	3	3
CO3	3	3	2	3	3	3	2	3	3	3
CO4	2	3	1	3	3	3	1	3	3	2
CO5	3	3	3	1	3	3	3	3	1	3

“1”–Slight(Low) Correlation ”2” – Moderate (Medium) correlation

“3”–Substantial(High) Correlation “-“indicates there is no correlation

Syllabus

UNIT	CONTENTS	HOURS	COs	COGNITIVE LEVEL
I	General Virology- Introduction and Historical perspective of clinical virology. Nomenclature, General Properties and Ultrastructure of viruses. viral replication, classification of Viruses- Baltimore and ICTV methods. Sample collection, Transport and examinations of viral Specimens. Incomplete viruses- Prions, Satellite Viruses, Viroids and Virusoids.	18	CO1, CO2, CO3	K1, K2, K3
II	General Methods of Diagnosis and Serology- Cultivation of clinically important viruses in embryonated eggs, experimental animals, cell cultures, cell lines and transgenic systems. Serological methods- Haem agglutination & HAI; complement fixation, Immuno fluorescence methods, PCR, ELISA and Radio immuno assays, Immuno blotting- Western Blot. Assay of viruses – physical, chemical and Infective assay. Antiviral agents and viral vaccines.	18	CO1, CO2, CO5	K1, K2, K3, K4
III	Air borne Viruses- Clinical Course, Disease burden, risk factor, Epidemiology, Prevention and Treatment of following Air borne viruses- Rhinovirus, Influenza Virus (A, B and H1N1), Varicella virus- Chicken pox, Mumps virus, Measles virus, MERS-Co V and SARS-Cov-2.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
IV	Food borne Viruses- Causative agent, Pathogenesis, Lab Diagnosis, Treatment and Prophylaxis of following Food borne Viruses- Adenovirus, Rotavirus, Hepatitis virus, Enteroviruses- Poliomyelitis, Calcivirus, Polio virus and Cocksackie viruses.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	<p>Vector borne Viruses- Morphology of Causative agent, clinical symptoms, pathogenesis, mode of transmission, prevention and treatment of the following Vector borne viral diseases-Chikungunya, Dengue, Yellow fever, Rabies and Ebola Viruses.</p> <p>Oncogenic Viruses - Pathogenesis, Diagnosis and Prevention of Oncogenic viruses- Human Papiloma virus, HIV, HTLV, Herpes and Epstein Barr Virus.</p>	18	CO1, CO2,CO3, CO4,CO5	K1, K2,K3, K4K5, K6
VI	<p>Self Study Enrichment(Not included for End Semester Examinations)</p> <p>Cultural Characters of Viruses, Qualitative and Quantitative estimation of Viruses, Structure and life cycle of viruses, Etiology and Classification of viruses and Viral Prophylaxis.</p>	-	CO1, CO2,CO3, CO4,CO5	K1, K2,K3, K4K5, K6

Text Books

1. Ananthanarayan and Jayaram Paniker(2020).*Text book of Microbiology*.11thEdition, London:OxfordUniversity press.
2. GeoBrooks,KarenCCarroll,JanetButelandStephenMorse(2020).*MedicalMicrobiology*.26th Edition, McGraw Hill Publication.
3. Jawetz,MelnickandAdelberg's(2019).*MedicalMicrobiology*.24thEdition,HillMedicalPublication division.
4. KennethJRyan,NafeesAhmadandAndrewAlspaughJ(2018).*SherrisMedicalMicrobiology*.7thEdition, McGraw Hill Education.
5. Mishra B(2018).*Text BookofMedicalVirology*.1st Edition, CBS Publishers.
6. GreenwoodD,SlackRC,BarerMRandIrvingWL(2018).*MedicalMicrobiology:AGuide to Medical Infections*.19thEdition,Churchill Livingstone Publishers.

Reference book

1. AejaIqbalandZafarNowshad(2020).*Medicalmicrobiology:MillenniumEdition*. Notion Press.
2. AlanJ.Cann(2015).*PrinciplesofMolecularVirology*.4thEdition,California:AcademicPress.
3. DimmockNJandPrimeroseSB(2016).*Introductiontomodernvirology*.4thEdition, London:OxfordBlackwell scientific publication.
4. SinghR.P(2015).*ImmunologyandMedicalMicrobiology*.1stEdition,NewDelhi:KalaniPublishers.

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1. https://www.youtube.com/watch?v=SAbYEYs-_ak
2. <https://www.youtube.com/watch?v=6RDofkmG1yo>
3. <https://www.youtube.com/watch?v=dGKeq7DH91c>
4. <https://www.youtube.com/watch?v=xEp-Sdgl9AU>
5. <https://www.youtube.com/watch?v=Kweu6hjWV9w>

Pedagogy

Chalk and talk, Quiz, Assignments, Group Discussion, Demo and PPT

Course Designer

Dr.S.Jeyabharathi

Semester : I	Internal Marks: 40		External Marks : 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB1CC1P	ESSENTIALS OF MICROBIOLOGY, BIOLOGICAL MACROMOLECULES AND CLINICAL VIROLOGY (P)	CORE PRACTICAL	6	5

Course objective

To impart knowledge about bacterial morphology, phage identification and estimation of nucleic acids

Prerequisites

Imparting practical skills of microbiology

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Learn and recall basic microbiological methods	K1
CO2	Understand fundamental techniques involving staining, Micrometry, sterilization, disinfection, culturing etc.	K2
CO3	Demonstrate various methods to study viruses and bacteria	K3
CO4	Evaluate and quantify the biological macromolecules	K5
CO5	Create and apply various standard operating procedures for handling microbes	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	2	2
CO2	3	2	2	3	3	3	2	2	3	2
CO3	3	3	3	3	3	3	2	2	2	2
CO4	3	2	3	2	3	3	2	3	3	2
CO5	3	3	3	2	2	3	2	3	3	2

“1”-Slight (Low) correlation

“3”- Substantial (High) correlation

“2”- Moderate(Medium) correlation

“-” indicates there is no correlation

Syllabus

I. Essentials of Microbiology

1. Safety measures to be followed in the laboratory
2. Study of compound microscope: use of monocular, binocular microscopes, use of oil immersion lens
3. Micrometry – measurement of cell dimensions
4. Study of instruments – autoclave, hot air oven, inoculation chamber (LAFU), Incubator, pH meter
5. Cleaning and sterilization of glassware and preparation of cleaning solutions
6. Enumeration of bacteria from environmental sample – Spread and Pour plate
7. Purification of bacteria by different streaking methods
8. Study of microbial behavior – motility of bacteria by hanging drop technique
9. Staining of bacteria - Monochrome staining, Preparation of Gram staining solutions, Gram staining, Negative staining, Structural staining – endospore, cell wall, capsule staining
10. Fungal slide culture

II. Biological Macromolecules

1. Preparation of buffer (Tris, Phosphate, Acetate buffer)
2. Determination of (H⁺) ion concentration
3. Verification of Beer-Lambert's law using coloured solution
4. Preparation of standard graph for the following and estimating the concentration in a microbial sample
 - Glucose-Anthrone method,
 - Bovine serum albumin (Lowry's method) and
 - Nucleic acid -DNA (diphenyl amine method),RNA(Orcinol method).
5. Separation of amino acids by paper chromatography and identification of amino acid. Separation of proteins by PAGE, SDS-PAGE-Demonstration.

III. Clinical Virology

1. Animal tissue culture - Demo
2. Embryonated egg inoculation
3. Cell lines studies - Demo

Reference Books

1. Saha R. (2022). *Microbiology Practical Manual, 2nd edition*. CBS Publishers & Distributors.
2. Apurba S Sastry , Sandhya Bhat.(2021).*Essentials of Practical Microbiology, 1st edition*. Jaypee Brothers Medical Publishers.
3. Baveja C. P, BavejaV. (2021).*Text and Practical Microbiology for MLT, 3rd edition*. Arya Publications.
4. Das S.(2020).*Microbiology Practical Manual, 1st edition* CBS Publishers.
5. Bharti Arora, AroraD.R. (2020).*Practical Microbiology, 2nd edition*. CBS Publishers & Distributors.
6. Sinha K P.(2020).*Manual of Practical Biochemistry, 1st edition*. Scientific Book Company.
7. Rafi Mohammed.(2020).*Manual of Practical Biochemistry, 3rd edition*. Orient

- Blackswan Pvt Ltd.
8. Soundravally Rajendiran , Pooja Dhiman.(2019).*Biochemistry Practical Manual, 1st edition*.Elsevier.
 9. Amita Jain , Jyotsna Agarwal , Vimala Venkatesh.(2018).*Microbiology Practical Manual, 1st edition* Elsevier.
 10. Gunasekaran P.(2018). *Laboratory Manual In Microbiology, 2nd edition*NewAge International Pvt. Ltd. Publisher.

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1. <https://microbiologyonline.org/file/7926d7789d8a2f7b2075109f68c3175e.pdf>
2. <https://ttk.elte.hu/dstore/document/893/book.pdf>
3. https://webstor.srmist.edu.in/web_assets/downloads/2021/18BTC103J-lab-manual.pdf
4. https://profiles.uonbi.ac.ke/jamesmuthomi/files/acp101_microbiology_practical_exercises.pdf
5. <https://www.slideshare.net/PatriciaCosta17/practical-handbook-of-microbiology>

Pedagogy

Chalk and talk, Quiz, Assignments, Group Discussions, Demo and PPT

Course Designer

Dr.P.F.Steffi

Semester : I	Internal Marks :25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB1DSE1A	BIOLOGICAL TECHNIQUES	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

To educate the students with the basic principles of microbial techniques so as to develop their research aptitude and career prospects.

Prerequisite

Basic understanding of experimental protocols on biological research.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO 1	Describe and compare various instrumentation protocols.	K1,K2
CO 2	Illustrate the working principles of biological techniques	K3
CO 3	Analyze the results of biological techniques.	K4
CO 4	Summarize the advantages of assorted techniques	K6
CO 5	Formulate the applications of instrumentation biology.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	2	3	1
CO2	3	3	3	2	2	3	2	3	2	2
CO3	3	3	2	2	3	3	2	3	2	2
CO4	3	2	3	2	2	3	2	3	2	1
CO5	3	3	3	3	2	3	2	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Microscopic Techniques-Basic principles, mechanisms and application of Bright Field, Dark field, Phase contrast, Polarization, Confocal laser scanning microscope, Fluorescence, Scanning Electron microscope & Transmission Electron Microscope (SEM & TEM) and Radio- frequency scanning tunneling microscopy, Atomic force microscopy. Preparation of microbial, animal and plant samples for microscopy.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6
II	Spectroscopy & Spectrometry- Basic	18	CO1, CO2,	K1, K2,

	concepts and applications of Circular Dichroism (CD) and Optical Rotatory Dispersion (ORD), Fluorescence spectroscopy, UV/Visible spectrophotometry, Infrared spectroscopy, Fourier-transform infrared spectroscopy (FTIR), Nuclear Magnetic Resonance spectroscopy (NMR).		CO3, CO4, CO5	K3, K4, K6
III	Chromatographic Techniques-Basic Principles and application of Thin-layer chromatography, Paper chromatography, Gel filtration chromatography, Ion- exchange chromatography, Affinity chromatography, Gas chromatography and High Performance Liquid chromatography.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6
IV	Centrifugation & Electrophoresis- Basic principles and applications of Centrifuges - Preparative, analytical, high speed, low speed, ultracentrifuge, differential and density gradient. Basic concepts and applications of Gel Electrophoresis- Agarose and acrylamide (native, denaturing and gradient), Isoelectric focusing, 2D Electrophoresis, Immuno-electrophoresis and Pulse field Electrophoresis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6
V	Radiography & Molecular Techniques-Basic principles and application of Autoradiography. Liquid scintillation counting, phosphor imaging, Imatinib Resistance Mutation Analysis. Types of PCR- Real time PCR, Reverse Transcriptase PCR, Multiplex PCR, Nested PCR and In-situ PCR. Blotting (Southern, Western, Northern) Techniques, DNA Finger printing, RFLP, RAPD and AFLP application.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6
VI	Self Study for Enrichment(Not included for End Semester Examination) Differentiate the functions of Microscope, Interpret the results of FTIR, Separation of the compounds using chromatography and centrifugation, Working principles of DNA Amplification.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K6

Text Books

1. Rao, D. M. (2020). *Instrumental Methods of Analysis*. 1st Edition. CBS publishers and distributors pvt ltd.
2. Gurdeep R. Chatwal. (2019). *Instrumental Methods of Chemical Analysis*. 3rd Edition. Himalaya publishing house.
3. Bhawana Pandey M.H. Fulekar. (2019). *Bioinstrumentation*. 5th Edition. Dream tech Press.
4. Gilbert H Mitchell. (2017). *Gel Electrophoresis: Types, Applications & Research*. 1st Edition. Nova Science Publishers .
5. Jessica carol. (2016). *Textbook of Analytical Biochemistry*. 1st Edition. Syrawood Publishing House.

Reference Books

1. Ankita Jain, Haresh Kalasariya, Varsha Tailor, Nikunj Patel. (2020). *Bioinstrumentation techniques-Basics and applications*. 1st Edition. Notion Press.
2. Gakhar, Monika Miglani, Ashwani Kumar. (2019). *Molecular Biology: A Laboratory Manual*. 1st Edition . Dreamtech Press.
3. Almroth E., Wright. (2018). *Principles of Microscopy: Being a Handbook to the Microscope*. 1st Edition . Forgotten Books.
4. *Andreas Hofmann and Samuel Clokie. (2018). Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology*. 8th Edition. Cambridge University Press.
5. *Sanjay B Bari. (2017). Theory and Practice of Chromatographic Techniques*. 1st Edition. Pharma Med Press.

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2. <https://research.ipmu.jp/seminar/sysimg/seminar/574.pdf>
3. <http://www-keeler.ch.cam.ac.uk/lectures/Irvine/>
4. https://www.ccamp.res.in/sites/default/files/Basics%20of%20Chromatography_KR_C-CAMP.pdf
5. http://www.bdu.ac.in/schools/biotechnology-and-genetic-engineering/biomedical-science/docs/course_materials/Biotechniques/Electrophoresis.pdf
6. https://ehs.psu.edu/sites/ehs/files/lsc_theory_of_operation_part_1.pdf
7. <https://www.youtube.com/watch?v=kOCcmJ3nVQ4>

Pedagogy

Power point presentations, Group Discussion, Seminar, Quiz, Assignment, Brain Storming Activity.

Course Designer

Dr.N.Sathammai Priya

Semester : I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB1DSE1B	ORGANIC FARMING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- This course aims at sensitizing the need and generating knowledge and skills on various organic farming practices, so as to equip the learners carrying out organic agricultural production and management.

Prerequisites

Basic knowledge and concepts of organic farming

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand the origin and importance of organic farming	K1, K2
CO2	Analyze and apply the methods in Organic Crop Production	K3, K4
CO3	Determine and Explain the methodology practiced in organic farming	K3, K4
CO4	Evaluate and categorize various organic farming system and crop protection practices	K4, K5
CO5	Criticize and manage the commercialization of organic products	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3	2	3	2	2	1
CO2	3	3	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	2	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction - Different concepts of organic farming – Natural farming, Biodynamic farming, and Zero Budget Farming. Principles of organic farming- Conventional farming v/s Organic farming. Benefits and Need for organic farming.	18	CO1, CO2, CO3,	K1, K2, K3, K4,
II	Development and Scope of organic farming; Requirements for organic farming-Soil fertility, Crop Nutrition & Nutrients inputs. Organic Crop Production Systems. Benefits of Integrated organic farming system.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
III	Green manuring- Composting- principles, stages, types and factors, Composting methods –Vermicomposting- and Preparation of Vermi wash, Organic amendments and sludges. Biofertilizers and their types- methods of application- advantages and disadvantages. Seed Propagation-planting materials and seed treatments, Water management -drip irrigation -rain water harvesting.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Plant protection- Integrated Pest Management- bio pesticides and Herbal pesticides- production at household/ farm level, Agniastra, Neemastra - mode of application-advantages. Biocontrol agents. Weed management- preventive practices, biological control of weeds, mechanical control, Standards for organic inputs, crop rotation-intercropping- Mulching-Pruning.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
V	Seed conservation- techniques- seed bank. Farm inspection and Process of Certification. Quality analysis of organic foods-Standards of organic foods- Organic Trademark-Marketing of Organic products. Economics of Organic Farming and Government schemes related to organic farming.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
VI	Self Study for Enrichment (Not included for End Semester Examinations) Farming components and preparation of organic nutrients. Preparation of Bio	-	CO1, CO2, CO3, CO4,	K1, K2, K3, K4,

	fertilizers - Bio pesticides and formulations. Study on crop rotation and mixed cropping techniques.		CO5,	K5, K6,
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Text Books

1. Joanne M Willey, Kathleen M Sandman and Dorothy H Wood. (2019). *Prescotts Microbiology*, McGraw-Hill, 11th Edition.
2. Unni M Rand Sabu Thomas. (2018). *Organic Farming Global Perspectives and Methods*. 1st Edition. Wood head Publishing.
3. Amitava Rakshit and H B Singh. (2018). *ABC of Organic Farming*. 1st Edition. Jain Brothers.
4. Maliwal P.L. (2019). *Principles of Organic Farming*. 1st Edition. Scientific Publishers.
5. Govind Mishra, Munish Kumar Verma, Ajeet Singh. (2019). *Organic farming*. 1st Edition. Sankalp Publication.

Reference Books

1. Bansal M. (2020). *Basics of Organic Farming*. 1st Edition. CBS publishers and Distributors Pvt. Ltd.
2. Janet Wilson. (2020). *Composting: Sustainable and Low- Cost Techniques for Beginners*. 1st Edition, Drip Digital Publisher.
3. Debabrata Biswas, Shirley A. Micallef. (2019). *Safety and Practice for Organic Food*. 1st Edition. Academic press Elsevier Science.
4. Vinaya Kumar Sethi. (2018). *Organic farming and bio-fertilizers*. 1st Edition. Discovery Publishing House Pvt. Ltd.

Web References

1. <https://www.24mantra.com/blogs/organic-farming-vs-conventional-farming-which-method-is-better/>
2. <https://www.onlinebiologynotes.com/biofertilizer-advantages-types-methods-of-application-and-disadvantages/>
3. <https://www.britannica.com/topic/seed-propagation>
4. <https://content.ces.ncsu.edu/extension-gardener-handbook/8-integrated-pest-management-ipm>
5. <https://www.agric.wa.gov.au/small-landholders-western-australia/marketing-organic-produce>
6. <https://youmatter.world/en/definition/organic-farming-definition-standards-benefits/>
7. <https://vikaspedia.in/agriculture/national-schemes-for-farmers/schemes-for-organic-farming>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion.

Course Designer

Dr. S. Jenny

Semester: I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB1DSE1C	MICROBIAL CYTOLOGY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

To introduce basics in prokaryotic and eukaryotic cell structures and its functions

Prerequisites

Microscopic and submicroscopic details of microorganisms.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Remember and analyze the main principles of cells theory	K1 K4
CO2	Outline view of cells	K2
CO3	Identify the Structural and functions of cells	K3
CO4	Analyze and compare the cell division and its functions	K4, K5
CO5	Discuss about the Microbial cell Communication	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	3	2	2	1
CO2	3	2	2	2	3	3	2	2	2	2
CO3	2	3	2	3	2	2	3	2	3	2
CO4	3	2	3	3	2	3	3	2	2	2
CO5	2	3	3	2	3	2	3	3	2	2

“1” – Slight (Low) Correlation
 “3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
 “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	History of microbial cytology, Cell-definition and general concepts, Main principles of the cell theory, cell as basic unit of life, broad classification of cell types-Prokaryotic and eukaryotic cells and their similarities and differences.	18	CO1, CO2, CO3	K1, K2, K3, K4
II	Structure and function of prokaryotic cell-outer flagella, surface layers, cell wall, cytosol and other organelles, chromosome and extra chromosomal DNA.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4
III	Structure and function of eukaryotic cell-cytosol, nucleus, chloroplast, organelles of Vesicular trafficking system, endoplasmic reticulum(rough and smooth), golgibodies, lysosomes and microbodies.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6.
IV	Role of cell cycle and control of cell cycle, cell division- Mitosis and Meiosis.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5
V	Overview- types of cell signaling- signal molecules – signal amplification – receptor types-quorum sensing.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6
VI	Self study for Enrichment(Not included for End Semester Examination) State the cell theory of organisms, Difference between prokaryotic and eukaryotic cell, Cell cycle control mechanism, Role of signal transduction.	-	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. Verma P.S. and Agarwal V.K. (2016) *Cell Biology (Cytology, Biomolecules, Molecular Biology)*, Paperback.S.Chand and Company Ltd.
2. Kumar P. and Mina U. (2018) *Life Sciences: Fundamentals and Practice, Part-I, 6th Edition*.Pathfinder Publication.
3. Hardin J. and Bertoni G. (2017) *Becker's World of the Cell. 9th Edition (Global Edition)*. Pearson Education Ltd.
4. Karp G., Iwasa J. and Masall W. (2015) *Karp's Cell and Molecular Biology – Concepts and Experiments. 8th Edition*. John Wiley and Sons.

5. Urry L.A. Cain M.L., Wasserman S.A., Minorsky P.V., Jackson R.B. and Reece J.B. (2014) *Campbell Biology in Focus*. Pearson Education.

Reference Books

1. Albert B., Hopkin K., Johnson A.D., Morgan D., Raff M., Roberts K. and Walter P. (2018) *Essential Cell Biology 5th Edition*. W.W. Norton & Company.
2. Cooper G.M. and Hausman R.E. (2016) *The Cell – A Molecular Approach, 7th Edition*. Sinauer Associates Inc.
3. Mason K.A., Losos J.B. and Singer S.R. (2011) *Raven and Johnson's Biology, 9th Edition*. Mc Graw Hill publications.
4. Alberts B., Johnson B., Lewis J., Morgan D., Raff M., Roberts K. and Walter P. (2015) *Molecular biology of cell, 6th Edition*. Garland Science, Taylor and Francis.
5. Challoner J. (2015) *The Cell: A visual tour of the building block of life*. The University of Chicago Press and Ivy Press Ltd.

Web References

1. <https://repository.embuni.ac.ke/bitstream/handle/123456789/1246/CYTOLOGY%20CHAPTER%201.pdf?sequence=1&isAllowed=y>
2. <https://biologydictionary.net/prokaryotic-cell/>
3. <https://opentextbc.ca/biology2eopenstax/chapter/eukaryotic-cells/#:~:text=Like%20a%20prokaryotic%20cell%2C%20a,that%20allow%20for%20compartmentalizing%20functions.>
4. <https://ncert.nic.in/textbook/pdf/kebo110.pdf>
5. <https://www.mdpi.com/2079-6382/9/11/779/pdf>

Pedagogy

Chalk and talk Quiz, Assignments, Group Discussions, Demo and PPT

Course Designer

Dr.E.Priya



Cauvery College for Women (Autonomous), Trichy
PG & Research Department of Microbiology
M.Sc., Microbiology

Learning Outcome Based Curriculum Framework (CBCS-LOCF)

(For the candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Course	Title	Course Code	Inst./ Hrs/Week	Credits	Exam			Total
						Hrs	Marks		
							Int.	Ext.	
II	Core Course- IV (CC)	Bacteriology and Mycology	22PMB2CC4	6	5	3	25	75	100
	Core Course– V (CC)	Immunology and Immunotechnology	22PMB2CC5	6	5	3	25	75	100
	Core Choice Course – I (CCC)	A. Microbial Metabolism	22PMB2CCC1A	6	4	3	25	75	100
		B. Environmental and Agricultural Microbiology	22PMB2CCC1B						
		C. Microbial Ecology	22PMB2CCC1C						
	Core Practical–II (CP)	Bacteriology, Mycology, Immunology and Immunotechnology (P)	22PMB2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course – II (DSE)	A. Biofertilizer Technology	22PMB2DSE2A	6	3	3	25	75	100
		B. Public Health Microbiology	22PMB2DSE2B						
		C. Marine Microbiology	22PMB2DSE2C						
Internship	Internship	22PMB2INT	-	2	-	-	100	100	
Extra Credit Course	Swayam Online Course		As Per UGC Recommendation						
Total				30	24	-	-	-	600

CO1	3	3	3	2	2	3	2	2	3	2
CO2	3	3	2	2	2	3	3	2	3	3
CO3	3	3	3	2	3	3	3	2	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Microbial Growth and Reproduction in bacteria: Prokaryotic cell cycle, chromosome replication and partitioning, growth cycle and mathematics of growth, phases of growth, calculation of generation time, measurement of microbial growth, measurement of cell mass, influence of environmental factors on growth, cultivation of anaerobic bacteria and accessing non-culturable.	18	CO1, CO2, CO3 CO4	K2, K3, K4, K5
II	Archaeobacteria : General characteristics and phylogenetic overview, genera belonging to Nanoarchaeota (Nanoarchaeum, Crenarchaeota (Sulfolobus, Thermoproteus), Korarchaeota, Euryarchaeota-Methanogens, Thermophiles, Halophiles and rhodopsin based phototrophy.	18	CO1, CO2, CO3, CO4	K2, K3, K4, K5

III	Classification of Eubacteria : morphology, metabolism, ecological significance and economic importance of eubacterial groups, Gram negative non proteobacteria, Gram negative Alpha proteobacteria, Beta proteobacteria, Gamma proteobacteria, Delta proteobacteria, Epsilon proteobacteria.	18	CO1, CO2, CO3, CO4	K2, K3, K4, K5
IV	General features of fungi- Various systems of classification of fungi. a. Ainsworth (1973) and b. Webstor (1980). Micrometry : Study of micrometry and its significance in fungal taxonomy. Culture: Types of culture media and their preparation, special culture media.	18	CO1, CO4, CO5	K2, K5, K6
V	Criteria used in the classification of fungi: a. Morphology: External and Internal, b. Vegetative and Reproductive, c. Cytological and Genetics, d. Serological and Nutritional. e. Physiological and Biochemical, f. Host specificity, g. Ultrastructural and cultural.	18	CO1, CO4 , CO5	K2, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Classification of Eubacteria II : Gram positive: low G+ C (Firmicutes): general characteristics with suitable examples, Gram positive: high G+C (Actinobacteria), Cyanobacteria: an Introduction	-	CO1, CO2, CO3,	K2, K3, K4

Text Books

1. Michael T. Madigan, John M. Martinko, Kelly S. Bender, Daniel H. Buckley And David A. Stahl, Pearson.(2015). Brock Biology Of Microorganisms, Fourteenth Edition,

Pearson, Boston.

2. Joanne, M. Willey, Linda, M. Sherwood, Christopher, J. Woolverton And Chris Woolverton, Mc Graw Hill. (2011). Prescott, Harley, And Klein's Microbiology, Eighth edition.
3. De Vos P.(2012). Bergey's Manual of Systematic Bacteriology: Volume 3: The Firmicutes, Springer, Second Edition, Newdelhi
4. Alexopoulos, C.J, Mims, C.W, Blackwell, M.(2007). Introductory Mycology, Fourth Edition, Wiley & Sons.
5. Aneja, K.R and Mehrotra, R.S.(2018). An Introduction to Mycology, New Age International (P) Ltd., Publishers.

Reference Books

1. Griffiths, A. B.(2019). A Manual of Bacteriology, Forgotten Books.
2. Edgar M Crookshank,(2018). Manual of Bacteriology, Forgotten Books.
3. Arora and Brij Bala Arora. (2019). Medical Mycology, Second Edition, CBS.
4. Hait.(2017). A Textbook of Mycology, New Central Book Agency (NCBA); 1st edition, India.

Web References

1. http://www.rvskvv.net/images/General-Bacteriology_23.04.2020.pdf
2. <https://www.eolss.net/sample-chapters/C03/E5-25-48.pdf>
3. <https://www.vnmu.edu.ua/downloads/microbiology/20131218-135731.pdf>
4. https://www.uobabylon.edu.iq/eprints/publication_1_13183_803.pdf
5. <https://www.microrao.com/micronotes/mycology.pdf>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion and Quiz.

Course Designer

Dr.N.Sathammai Priya

Semester : II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2CC5	IMMUNOLOGY AND IMMUNOTECHNOLOGY	CORE COURSE	6	5

Course Objective

The students will acquire the competency to serve as future teachers, trainers and researchers in the field.

Prerequisites

Understand and critically analyze the literature in the field of Immunology and its technical aspects in the field of Immunology.

Course Outcome and Cognitive Level Mapping.

CO Number	CO Statement	Cognitive Level
CO1	Explain the basics of immunology	K2
CO2	Illustrate the hypersensitivity reaction	K3
CO3	Categorize auto immunity and auto immune disease	K4
CO4	Interpret transplantation and tumor immunology	K5
CO5	Discuss molecular immunology and immuno diagnosis	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	2	3	2	3	3	3	3	3	3	3
CO3	3	2	3	3	2	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3
CO5	3	3	3	2	3	3	2	3	3	3

1- Slight (Low) correlation 2- Moderate (Medium) correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Basic Immunology: History of Immunology, Types of Immunity, Cells and organs involved in immune system (T-cells, B-cells, lymphoid organ, spleen and bone marrow), immune responses – cell mediated and humoral, Antigens, Cytokine, Haptens, adjuvants, Antibodies: their structure and functions, Complement system, Antigen processing cells, Classes of Immunoglobulin (IgA, IgG, IgD, IgM and IgE).	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Hypersensitivity reaction: IgE-mediated (type-I), Ab-mediated cytotoxic (type-II), Immune complex mediated (type-III) and Delayed type hypersensitivity (type-IV).	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Auto immunity and auto immune disease: (a) Organs specific autoimmune disease – Hashimoto’s thyroiditis, Good pastures syndrome, Insulin dependent diabetes mellitus, Grave’s disease, Myasthenia gravis. (b) Systemic autoimmune disease – systemic lupus erythematosus (SLE), Multiple sclerosis, Rheumatoid arthritis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Transplantation and Tumor immunology: Transplantation and its classification, Immunologic basis of graft rejection and its	18	CO1, CO2, CO3,	K1, K2, K3,

	mechanism, Transplantation antigens, tissue typing role of MHC molecules in allograft rejection and immune suppressive therapy. Tumors of the immune system, tumor antigens and immune response to tumors, detection of tumor markers and tumor immunotherapy.		CO4, CO5	K4, K5, K6
V	Molecular Immunology and Immuno diagnosis Antigen antibody interaction – Precipitation reactions, Agglutination reactions, ABO Blood typing principles. Principles and applications of ELISA, Radio Immuno Assay, western blot analysis, immune electrophoresis, Immunofluorescence and chemiluminescence assay.	18	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5, K6
VI	UNIT VI – Self study for Enrichment (Not included for End Semester Examination) Immunological memory, Non-allergic hypersensitivity, Nutrition and autoimmunity, Advances in tumor immunology and fluorescence activated cell sorting (FACS) analysis.	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4, K5, K6

Text Books

1. Coico R. and Geoffrey S. (2015) *Immunology: A Short Course. 7th Edition.* Wiley-Blackwell.
2. Singh R.P. (2015) *Immunology and Medical Microbiology. 2nd Edition.* Kalyani Publishers, New Delhi.
3. Talwar C.P. and Gupta S. K. (2017) *Hand Book of Practical and Clinical Immunology.* CBS Publishers & Distributors.
4. Shyamasree G. (2021) *Immunology and Immunotechnology. 2nd Edition.* Books & Allied Pvt.Ltd.
5. Gupta. S. K. and Goswani. B. (2021) *Immunology for MBBS.* APC Books.
6. Misbah S.A., Spickett G.P. and Dalm V.A.S.H. (2022) *Chapel and Haeney's Essentials of Clinical Immunology. 7th Edition.* Wiley-Blackwell.

Reference Books

1. Sudha G. and Shubhangi S. (2013) *Textbook of Basic and Clinical Immunology*. Universities Press (India) Pvt. Ltd.
2. Rich R., Fleisher T., Shearer W., Schroeder H., Frew A. and Weyand C. (2018) *Clinical Immunology: Principles and Practice*. Elsevier.
3. Abbas A.K., Lichtman A.H. and Pillai S. (2019) *Basic Immunology (Functions and Disorders of the Immune System)*. 6th Edition. Elsevier.
4. Punt J. (2019) *Kuby Immunology*. 8th Edition. Macmillan Learning.
5. Ian C Clift. (2020) *Clinical Immunodiagnosics: Laboratory Principles and Practices*. Jones & Bartlett Publishers.
6. Chakravarty A.K. (2021) *Immunology and Immunotechnology*. Oxford University Press.

Web References

1. <https://www.medicosrepublic.com/kuby-immunology-8th-edition-pdf-free-download/>
2. <https://muhammad1988adeel.files.wordpress.com/2011/04/kuby-immunology-6th-edition.pdf>
3. <https://med-mu.com/wp-content/uploads/2018/06/Essentials-of-Clinical-Immunology-6E-Chapel-Haeney-Misbah--Snowden.pdf>
4. <https://www.wiley.com/en-us/Essentials+of+Clinical+Immunology%2C+Includes+Wiley+E+Text%2C+6th+Edition-p-9781118472958>
5. <https://www.flipkart.com/essential-clinical-immunology/p/itmzczkduhtrf52d>

Pedagogy

Chalk and talk, Power Point Presentation, Quiz, Assignments, Group Discussions, Seminar, Assignment.

Course Designer

Dr. N. Jeenathunisa

Semester: II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2CCC1A	MICROBIAL METABOLISM	CORE CHOICE COURSE	6	4

Course Objectives

This course deals with how to make microbes differentiate based on the metabolism and describe how microbes do catabolism to get energy and metabolism to build structure.

Prerequisites

Basic knowledge on Physiological processes of Microbes.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand the basic concepts of metabolism	K1,K2
CO2	Explain and analyze about the growth phases of Microbial populations	K3, K4
CO3	Analyze about Microbial respiration	K3, K4
CO4	Criticize about bacterial photosynthesis	K5, K6
CO5	Assess about microbial biosynthesis	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2	2	3	3	2	2
CO2	3	2	3	2	3	3	3	3	3	2
CO3	3	2	2	2	3	3	2	2	2	2
CO4	2	2	2	3	2	3	2	2	2	2

CO5	2	3	2	2	3	3	3	3	3	2
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“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Metabolism-Definition - specific functions and types- Anabolism versus Catabolism. Metabolic pathways – Linear, irreversible and branched metabolic pathways. Mechanisms of enzyme reaction – the role of ATP, reducing power and precursor metabolites in metabolism. Biochemical mechanisms of generating ATP. Components of electron transport chains - NAD, NADP, FAD, FMN, Coenzyme-Q, Cytochromes..	18	CO1, CO2, CO3	K1, K2, K3, K4,
II	Microbial Growth- Phases of growth, Growth kinetics - batch culture, continuous culture and synchronous culture - induction of synchrony. Factors affecting growth - nutrition, aeration, temperature and pH. Physiological adaptation to extreme environmental conditions. Nutritional types and metabolic diversity - types based on carbon, energy and electron sources. Measurement of cell numbers, cell mass and metabolic activity.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5
III	Respiration- Aerobic respiration: glycolysis, Pentose Phosphate pathway, TCA cycle. Glyoxylate cycle. Respiratory electron	18	CO1, CO2, CO3, CO4	K1, K2, K3,

	transport in mitochondria and bacteria. Anaerobic respirations: sulfate, nitrate, carbonate respirations and their ecological significance. Intracellular location and reactions, Amphibolic reactions.			K4, K5
IV	Bacterial Photosynthesis - Brief account of photosynthesis – oxygenic and anoxygenic photosynthesis. fixation of CO ₂ - Calvin cycle - C ₃ -C ₄ pathway. Chemolithotrophic oxidations - Sulfur, Iron, Hydrogen and Nitrogen oxidations. Methanogenesis, Basic aspects of bioenergetics – entropy, enthalpy, equilibrium constant, electron carriers, artificial electron donors, inhibitors, uncouplers, energy bond, phosphorylation.	18	CO ₁ , CO ₂ , CO ₃ , CO ₄ , CO ₅	K1, K2, K3, K4, K5, K6
V	Microbial Biosynthesis-Biosynthesis of Peptidoglycan, Biopolymers, Amino acids, Fatty acids, Vitamins and their regulations. Assimilation of Nitrogen, Sulfur, Phosphorus.	18	CO ₁ , CO ₂ , CO ₃ , CO ₄ , CO ₅	K1, K2, K3, K4, K5,K6
VI	Self Study for Enrichment (Not included for End Semester Examinations) Bioluminescence: Bioluminescent bacteria and its importance. Biochemistry of Luciferin- Luciferase along with the lux operon (genes).	-	CO ₁ , CO ₂ , CO ₃ , CO ₄ , CO ₅	K1, K2, K3, K4, K5,K6

Text Books

1. Satyanarayana, U. and Chakrapani, U. (2013) Biochemistry, Fourth Edition. Book and Allied Pvt, Kolkata.
2. Stryer L. (2010) Biochemistry Seventh Edition. W.H. Freeman and Company, New York.
3. Monika Rustugi (2016). Bacterial Metabolism . Meditech.

4. Anadhi, D. (2014). Introduction to Biochemistry and Metabolism. Pearson Education India

Reference Books

1. Tyrrell Conway, Paul S. Cohen. (2015) Metabolism and Bacterial Pathogenesis. ASM Press.
2. Rabus, R. (Oldenburg) Saier Jr., M.H. (La Jolla, CA. (2022). Microbial Physiology. Karger Publication.
3. Walid EI Sharoud. (2011). Bacterial Physiology: A Molecular Approach. Springer.
4. G.N.Cohen.(2011). Microbial Biochemistry.Springer.

Web References

1. <https://download.e-bookshelf.de/download/0000/5838/44/L-G-0000583844-0002360696.pdf>
2. <https://www.perlego.com/book/2771785/microbial-physiology-pdf>
3. <https://www.slideshare.net/cavoyc/physiology-of-microorganism-1>
4. <https://byjus.com/biology/metabolism/>
5. <https://www.britannica.com/science/metabolism>

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion, Quiz.

Course Designer

Ms.S.Sathya

Semester : II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2CCC1B	ENVIRONMENTAL AND AGRICULTURAL MICROBIOLOGY	CORE CHOICE COURSE	6	4

Course Objective

To enable the students to get exposure on relationship between microbes and nature, its roles and its utilization for the creation of sustainable environment and their concepts, Biofertilizer role, Biogeochemical cycles and Plant diseases.

Prerequisites

Basic knowledge about Environment and Agricultural systems.

Course Outcomes and Cognitive Level Mapping

COs	CO Statement	Cognitive level
CO1	Define the basic view of air Microorganisms	K1
CO2	Explain the Microbial association in water	K2
CO3	Discuss about water pollution and water quality	K6
CO4	Understand the production of Biofertilizer	K4
CO5	Discuss about Plant diseases & Control measures	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	3
CO2	3	2	3	3	3	3	3	3	2	3
CO3	2	3	3	3	3	3	3	2	3	3
CO4	3	3	2	3	3	3	3	3	3	2
CO5	3	3	3	3	2	3	2	3	3	3

“1”- Slight (Low) correlation “2”- Moderate (Medium) correlation

“3”- Substantial (High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Air microbiology: Significance of air microflora-Microbial air pollution-sources, biological indicators and effects on plants and human beings. Enumeration of bacteria from air. Air borne diseases. Role of microbes in biogeochemical cycles – carbon, nitrogen, phosphorus, sulphur.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Microbes in marine and fresh water environment – eutrophication – Biodegradation and bioaccumulation – bioremediation concepts, microbial and phytoremediation – composting – solid waste treatment – saccharification and pyrolysis.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4
III	Water pollution – sources and nature of pollutants in water – sewage – treatment of liquid waste – primary, secondary and tertiary treatment – water borne diseases – Assessment of water quality – BOD and COD determinations.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6.
IV	Microbial association – beneficial – nitrogen fixing organism – symbiosis, asymbiosis, associate symbiosis – bacteria, Actinomycetes, cyanobacteria – mycorrhiza – ecto, endo and ectendo mycorrhiza – phosphate solubilizers – application of biofertilizers in agriculture. Biology of nitrogen fixation – genes and regulations in Rhizobium.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

V	Plant pathogens – bacterial – viral – fungal pathogens. Morphological, physiological changes with reference to disease establishment in plants – plant protection – phenolics – phytoalexins and related compounds. Bioinsecticides – viral, bacterial and fungal.	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Soil microbes and fertility of soil. Bioaugmentation, Xenobiotics degradation. Plant growth promoting rhizobacteria (PGPR). Role of biofertilizer in integrated nutrient management.	-	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5

Text Books

1. Bibhuti Bhusan Mishra, Suraja Kumar Nayak, Swati Mohapatra, Deviprasad Samantaray (2021). *Environmental and Agricultural Microbiology: Applications for Sustainability*. Wiley-Scrivener; 1st edition.
2. Robert L.Tate (2020). *Soil Microbiology*. John Wiley & Sons 3rd edition.
3. Subba Rao (2020) *Soil Microbiology*. Oxford Publishing.
4. Mangesh Y Dudhe (2020). *Agriculture- Microbiology*. New Vishal Publications.
5. Krishnendu Acharya, Surjit Sen and Manjula Rai (2019) *Biofertilizers and Biopesticides*. Techno World.
6. Aneja (2017) *Fundamental- Agricultural Microbiology*. New Age International (P) Ltd Publishers.

Reference Books

1. Pareek and Navneet Pareek (2019). *Agricultural Microbiology*. Scientific Publishers.
2. Paul (2015). *Soil Microbiology, Ecology and Biochemistry*. Academic Press.
3. Trivedi (2015). *Agriculture Microbiology and Microbial Applications*. Pointer Publishers.
4. Gupta, S.K.(2014) *Approaches and trends in plant disease management*. Scientific publishers.
5. Jamaluddin (2013) *Microbes and sustainable plant productivity*. Scientific Publishers.

Web References

1. <https://www.tandfonline.com/doi/abs/10.1080/10643387409381619?journalCode=best18>
2. <https://forages.oregonstate.edu/nfgc/eo/onlineforagecurriculum/instructormaterials/availabletopics/nitrogenfixation/definition>
3. <https://cropwatch.unl.edu/soybean-management/plant-disease>
4. <https://www.biologydiscussion.com/biotechnology/biodegradation/biodegradation-and-bioremediation-with-diagram/11043>
5. <https://thebiologynotes.com/biopesticides/>

Pedagogy

Chalk and talk ,Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

Course Designer

Ms.K.Sangeetha

Semester: II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/WEEK	CREDITS
22PMB2CCC1C	MICROBIAL ECOLOGY	CORE CHOICE COURSE	6	4

Course Objective

To create awareness on evolutionary relationship of ecosystem and its interactions. To understand the concepts of community ecology and strategies for biodiversity conservation.

Prerequisite

Basic Knowledge of Ecological concepts

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Examine basic concept of ecosystem	K4
CO2	Determine the microorganisms and their natural habitats	K4
CO3	Evaluate the environmental pollution	K5
CO4	Diagnose waste management system	K5
CO5	Extend the biodiversity and its conservation	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	2	3
CO2	3	3	2	3	2	3	3	2	3	2
CO3	3	2	3	3	2	2	3	3	3	2
CO4	2	3	2	3	3	3	3	3	2	3
CO5	2	3	3	2	3	3	2	3	3	2

“ 1”- Slight (Low) correlation “2”- Moderate (Medium) correlation

“ 3”- Substantial (High) correlation “-” indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	History, significance, principle, scope and development of microbial ecology. Population ecology: Characteristics of a population; population growth curves; population regulation; life history strategies (r and K selection); concept of metapopulation. Biological Interactions: Microbe–Microbe Interactions, Microbe–Plant Interactions, Microbe–Animal Interactions. Ecological succession: mechanisms; concept of climax.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
II	Ecosystem – structure and functions. Abiotic and biotic components. Energy flow, food chain, food web, ecological pyramids and types. Terrestrial Environment: Soil characteristics, Soil profile, Soil formation, Soil as a natural habitat of microbes, Soil microflora. Aquatic Environment: Stratification & Microflora of Freshwater & Marine habitats. Atmosphere: Stratification of the Atmosphere.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	Environmental pollution-Air pollution: Sources and classification of major air pollutants; Noise pollution- concept and effects. Soil pollution: sources and types of soil and water pollutants; effect of pollutants on soil health and productivity; Radioactive pollutants, their lifetime and disposal; Water pollution: major sources and types of water pollutants; pollution in fresh and sea water bodies. Efficient	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6.

	microbes in Pollution control. Climate change: Global warming and green house effects.			
IV	Waste management- Solid and liquid wastes. Physical, chemical and biological properties of wastes; Effluent treatment- sewage and other agro-industrial wastes; Biomagnification and its impact on loss of biodiversity. Biodegradation and Bioconversion of organic wastes; Microbiological and public health aspects of waste disposal; heavy metal contamination of environments. Source and sinks of heavy metals	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5
V	Biodiversity- concepts, levels and types; strategies for biodiversity conservation. Biodiversity-status, monitoring and documentation; major drivers of biodiversity change; biodiversity management approaches. Principles of conservation- <i>in-situ</i> and <i>ex-situ</i> . Major approaches to management. Miyawaki forest.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self study for Enrichment (Not included for End Semester Examination) Ecological succession-types, Aero microflora, dispersal of microbes. Sources and sinks of greenhouse gases, Acid rain. E.- waste management. Biodiversity hot spots in India and world.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Joseph C Daniel(1999). *Environment Aspects of Microbiology 1st Edition*. Bright sun Publications, Chennai.
2. Vaun Mc Arthur (2009). *Microbial Ecology – An Evolutionary approach*. Elsevierpublications, Academic press.
3. Saha, T.K (2010). *Ecology and Environmental Biology*. Books and Allied Pvt. Ltd.

Kolkata.

4. Edward J Kormandy (2017). *Concepts of Ecology*. Pearson India
5. P.D.Sharma (2018). *Fundamentals of Ecology*. Rastogi Publications.
6. Vaishali Anand (2020). *Environment and Ecology*. Mc Graw Hill.

Reference Books

1. Atlas, R.A and Bartha, R (2000). *Microbial Ecology, Fundamentals and Application*. Benjamin Cummings, New York.
2. Nduka Okafor. (2011). *Environmental Microbiology of Aquatic and Waste Systems*. Springer Dordrecht Heidelberg London New York
3. Ian Pepper Charles Gerba Terry Gentry (2014). *Environmental Microbiology 3rd Edition*. Academic press. USA.
4. Prescott, L.M., Harley, J.P. and Helin D.A. (2017). *Microbiology 10th Edition*. McGraw Hill, New York.

Web References

1. <https://study.com/learn/lesson/metapopulation-concept-model.html>
2. <https://study.com/academy/lesson/what-is-a-terrestrial-ecosystem-definition-examples-types.html>
3. <https://microbiologysociety.org/blog/bioremediation-the-pollution-solution.html#:~:text=Currently%2C%20microbes%20are%20used%20to,processes%20known%20as%20'bioremediation'.&text=Bioremediation%20uses%20micro%2Dorganism%20to,pollutants%20into%20non%2Dtoxic%20substances.>
4. <https://www.biologydiscussion.com/biodiversity/biodiversity-concept-types-and-other-details-with-diagram/7132>
5. <https://www.intechopen.com/chapters/45093>

Pedagogy

Chalk and talk, Power point presentation, Group Discussion, Seminar, Quiz, Assignment.

Course Designer

Ms.K.Sangeetha

Semester: II	Internal Marks: 40	External Marks: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB2CC2P	BACTERIOLOGY, MYCOLOGY, IMMUNOLOGY AND IMMUNOTECHNOLOGY (P)	CORE PRACTICAL	6	5

Course Objective

To impart knowledge about pure culture, staining & immuno techniques.

Prerequisites

Basic knowledge and concepts of bacteriological, mycological and immunological techniques.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Analyze the Growth nature of organisms	K4
CO2	Assess the staining techniques	K5
CO3	Evaluate on bacterial motility	K5
CO4	Determine ABO blood grouping	K5
CO5	Compiled view of immune techniques	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	3	3	3	3	2	3
CO2	3	2	3	3	2	2	3	2	3	3
CO3	3	2	2	3	3	3	2	3	3	2
CO4	2	3	3	2	3	3	3	2	3	2
CO5	3	3	2	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

BACTERIOLOGY

1. Preparation of culture media for cultivation of bacteria from air, water & soil
2. Pure culture techniques – dilution-plating, Streak-plate, Spread-plate, Pour-Plate
3. Staining Techniques – Simple and Differential (Gram Staining and Spore Staining)
4. Hanging drop method

MYCOLOGY

1. Preparation of culture media for cultivation of fungi
2. Isolation and identification of major classes of fungi
3. KOH Mount, LCB Mount

IMMUNOLOGY & IMMUNOTECHNOLOGY

1. ABO blood grouping.
2. Perform Total Leukocyte Count of the given blood sample.
4. Separation of serum from the blood sample.
5. Perform immunodiffusion by Ouchterlony method.
6. Perform single radient immunodiffusion
7. Perform DOT ELISA.
3. Perform Differential Leukocyte Count of the given blood sample
8. Perform immuno electrophoresis.

Reference Books

1. Arora. D. R and Brij Bala Arora. (2019). Medical Mycology. Second Edition. CBS Publisher.
2. Punt J. (2019) *Kuby Immunology. 8th Edition*. Macmillan Learning.
3. Ian C Clift. (2020) *Clinical Immunodiagnosics: Laboratory Principles and Practices*.

4. Elsa Cooper, (2018). Microbial Physiology: A Practical Approach. Callisto Reference.
5. Gerhard Gottschalk, (2020). Bacterial Metabolism. Springer.

Web References

1. <https://fccljohnson.files.wordpress.com/2012/10/kim-and-gadd-bacterial-physiology-and-metabolism-b-h-kim-g-m-gadd-cambridge-university-press-2008.pdf>
2. <https://medicine.yale.edu/labmed/sections/immunology/>
3. <https://aacijournal.biomedcentral.com/articles/supplements/volume-14-supplement-2>
4. <https://vlab.amrita.edu/?sub=3&brch=73&sim=1105&cnt=6>

Pedagogy

Chalk and Talk, demo and hands-on.

Course Designer

Dr. R. Nithyatharani

“1” – Slight (Low) Correlation
 “3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation
 “-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Biofertilizers–characteristics-types- Bacterial, Fungal, Algal and Actinorhizal, Plant Growth Promoting Rhizobacteria (PGPR). Advantages and limitations of biofertilizers.	18	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5,K6
II	Bacterial biofertilizer-production and application of <i>Rhizobium</i> , <i>Azospirillum</i> , <i>Azotobacter</i> and <i>Glucano acetobacter</i> . <i>Rhizobium</i> nodule formation- Mechanism-biochemistry of Nitrogen fixation. Phosphate solubilizing bacteria- phosphate solubilizers, phosphate mobilizers-mechanism of phosphate solubilization.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5, K6
III	Fungal biofertilizer - Mycorrhizae- AM and VAM fungi and its types- production. Actinorhizal biofertilizer- Frankia- <i>Casuarina</i> symbiosis- Frankia characters and their importance.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5, K6
IV	Algal biofertilizer -Blue green algae- characteristics, production and application. Azolla –cultivation and application.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5,K6,
V	Biocontrol agents- characteristics - <i>Pseudomonas</i> , <i>Trichoderma</i> . Bioinsecticides- <i>Bacillus thuringiensis</i> , <i>Verticillium</i> , <i>Beauveria</i> , <i>Metarhizium</i> . Biopesticides.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5,K6,
VI	Self Study for Enrichment (Not included for End Semester Examinations) Liquid biofertilizer production- application methods. Field visits	-	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,

Text Books

1. ReetaKoshla, (2017). Biofertilizers and biocontrol agents for organic farming. Kojo Press.
2. Hyma. P, (2017). Biofertilizers: Commercial production Technology and Quality Control. Random Publications.
3. Bikas. R. Pati, (2016). Recent Trends in Bio-fertilizers. I.K. International.
4. Dr. K. Kumar, K. Govindarajan, S.Kumarkannaiyan (2010) Biofertilizer Technology Scientific Publisher (India).

Reference Books

1. Dinesh K Maheswari, (2012). Bacteria in agrobiolgy. Springer Heidelberg, New York.
2. Mahendra K Rai, (2015). The Handbook Microbial Biofertilizers 9th edition. Haworth Press, Inc. New York.
3. BoopanderGiri, Ram Prasad, Qiang-Sheng Wu, Ajit Varma, (2019). Bio-fertilizers of sustainable agriculture and environment. Springer.
4. AmitavaRakshit, Vijay Meena, Manoj Parihar, H.B. Singh, A.K.Singh, (2021). Bio-fertilizers. Elsevier

Web References

- 1..https://www.researchgate.net/publication/323185331_Role_of_Biofertilizers_in_Agriculture
- 2..https://www.researchgate.net/publication/225980699_Bacterial_Biofertilizers
- 3..<https://www.fungaldiversity.org/fdp/sfdp/FD38-2.pdf>
- 4..<https://annamalaiuniversity.ac.in/studport/download/VAC%20Syllabus/VAAG%20011.pdf>
- 5..<https://www.apsnet.org/edcenter/disimpactmngmnt/topc/Documents/PHI-BiologicalControl.pdf>[https://www.fehd.gov.hk/english/pestcontrol/images/Pestnews_45e\(text\).pdf](https://www.fehd.gov.hk/english/pestcontrol/images/Pestnews_45e(text).pdf)

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion.

Course Designer

Dr. R. Nithyatharani

Semester : II	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22PMB2DSE2B	PUBLIC HEALTH MICROBIOLOGY	DISCIPLINE SPECIFIC ELECTIVE COURSE	6	3

Course Objectives

This course deals with the microbes related to public health and to gain knowledge about the medically important human microbial pathogens with focus on the diseases caused by them, disease pathogenesis, lab diagnosis, prophylaxis, control measures.

Prerequisites

Basic knowledge about diagnosis and treatment methods for various microbial infections.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and examine the basic ideas about microbial association	K1,K4
CO2	Diagnose and analyze various airborne disease	K3,K4
CO3	Determine the water borne diseases and its control	K1,K4
CO4	Evaluate and discuss about the role of microorganisms in food	K3,K5
CO5	Extend the diagnosis hospital acquired Infections	K2,K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	3	3	3	3	2	3
CO2	2	3	2	3	3	3	2	3	3	3
CO3	3	2	3	3	3	3	2	3	2	3
CO4	3	2	2	2	2	3	2	2	2	3
CO5	3	2	3	3	2	2	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to public health: Definition, scope, concept and importance of public health microbiology – roles of microbiologist in public health – microbial association of water, air and soil. Basic concept on pollution and its types.	18	CO1, CO2, CO3	K1, K3, K4
II	Air borne infections: Air and its composition – indoor air and outdoor air. Air borne diseases- (bacterial, fungal and viral), Sources of infection. Methods of enumeration of microorganisms in air – air sanitation.	18	CO1, CO2, CO3, CO4	K1, K3, K4, K5
III	Water borne infections: Kinds of water – water borne diseases (viral, bacterial, protozoan) – methods of enumeration of microorganisms in water – indicator organisms – water treatment control of water borne diseases.	18	CO1, CO2, CO3, CO4	K1, K3, K4, K5
IV	Food borne diseases: Definition and importance of food hygiene – types (spoilage of meat and its products, milk and dairy products, fish and fish products and eggs) – Role of microorganisms in food spoilage and poisoning – food borne diseases – types of food borne diseases – food poisoning – food borne infection. Principles of Food microbiological analysis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Nosocomial infection: Introduction and its types, pathogenicity of nosocomial infection, prevention and control of nosocomial infections. Prophylactic immunization – disposal of infective hospital and laboratory materials – monitoring of sanitation in the community – techniques used	18	CO1, CO2, CO3, CO4 CO5	K1, K2, K3, K4, K5, K6

	for the diagnosis of hospital acquired infection.			
VI	Self Study for Enrichment (Not included for End Semester Examinations) Classification of Medically important Microbes.	-	CO1, CO2, CO3, CO4	K1, K2, K3, K4, K5, K6

Text Books

1. Patrick R. Murray, Ken S. Rosenthal, and. Michael A. Pfaller.(2012).Medical Microbiology. Elsevier Health Sciences.
2. Keith Struthers.J.(2017).Clinical Microbiology. Taylor& Francis Group.
3. Sastry Apurba.S.(2021).Essentials of Microbiology. Jaypee Brothers Medical Publishers
4. Gerard Tortora (Author), Berdell Funke (Author), Christine Case.(2022).Microbiology An Introduction. Pearson Mastering.

Reference Books

1. Joanne Willey, Christopher J. Woolverton, Linda Sherwood (2011).Prescott's Microbiology. McGraw Hill
2. Park.K.(2017).Parks Text Book of Preventive and Social Medicine.
3. Goering, Hazel Dockrell, Mark Zuckerman, Peter Chiodini.(2018).Mim's Medical Microbiology and Immunology
4. Engelkirk.P.K. and Duben-Engelkirk.J.(2015).Burton's Microbiology for the Health Sciences,10th Edn.Wolters Kluwer Health.

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1. https://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/env_occupational_health_students/medicalbacteriology.pdf
2. <https://ysmubooks.am/uploads/Microbiology.pdf>
3. <https://www.slideshare.net/MMASSY/intro-to-medical-microbiology-lecture-notes>
4. http://samples.jbpub.com/9781284032314/9781284032314_ch01_001_016.pdf

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion, Quiz.

Course Designer

Ms.S.Sathya

Semester: II	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK	CREDITS
22PMB2DSE2C	MARINE MICROBIOLOGY	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

This course deals with the study of microorganisms in sea environment including their biodiversity, ecology and biogeochemistry, so as to equip the learners to understand the microbial diversity in marine environment.

Prerequisites

Basic knowledge and concepts of Marine microbial diversity.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Define and understand the marine microbes and kingdom concepts	K1, K2
CO2	Analyze and apply the role of microbes in seawater habitats	K3, K4
CO3	Determine and Explain the Biogeo chemical processes in marine systems	K3, K4
CO4	Evaluate and categorize various application of marine microbial products	K4, K5
CO5	Criticize and manage the Biodegradation methods for marine pollutants	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	2	3	2	3	2	2	1
CO2	3	3	2	3	3	2	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	2	2	3	2	2	2	3
CO5	3	3	3	3	3	3	3	3	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Marine Microbes- Classification- Haeckel's three kingdom, Whittaker's five kingdom, Carl Woese three domain concepts. Marine bacteria and Archaea, Marine fungi, and Marine viruses.	18	CO1, CO2, CO3,	K1, K2, K3, K4,
II	Marine Habitats- Role of microbes in sea water habitats- coastal, intertidal, estuaries, shores, salt marsh, mangrove, lagoon, coral reef, deepsea, hydrothermal vents. Sea weeds, Sea grasses, Kelp forest and uses. Marine Microbial food web.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
III	Marine Biogeochemistry- Chemical and physical factors in the marine environment- Properties of seawater. Biogeochemical processes in marine systems- carbon, nitrogen, oxygen, sulfur and phosphorous cycle.	18	CO1, CO2, CO3, CO4,	K1, K2, K3, K4, K5,
IV	Marine Microbial Products- Marine microbes of Biotechnological importance; Marine hydrocolloids (Agar, Agarose, Carrageenan and Alginate), Marine drugs- bioactive compounds, Marine Nutraceutical- functional foods.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
V	Marine Pollution- Sources- domestic, industrial and agricultural discharges- oil pollution- thermal and radioactive pollution. Biodegradation and bioremediation of marine pollutants. Biofouling- biofilm formation- related microbes- control & prevention methods.	18	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,
VI	Self Study for Enrichment (Not included for End Semester Examinations) Extremophiles- biotechnological applications. Marine flora & fauna. Composition of sea water and brackish water. Antifouling coating- production.	-	CO1, CO2, CO3, CO4, CO5,	K1, K2, K3, K4, K5, K6,

Text Books

1. Verma Divya, (2022). Marine Microbiology Ecology and Application. 1st Edition. Bio-Green Publishers
2. Colin B. Munn. (2019). Marine Microbiology. 3rd Edition. CRC Press Publishers.
3. Steffi P. F. Rajeswari Anburtaj. (2020) A Textbook on Marine Microbiology. 1st Edition. Ryan Publishers.
4. Se-Kwon Kim. (2013). Marine Microbiology Bioactive Compounds and Biotechnological Applications. 1st Edition. John Wiley Publishers.

Reference Books

1. Anjana K. Vala, Bharti P. Dave, Dushyant R. Dudhagara. (2021). Marine Microbial Bioremediation. 1st Edition. CRC Press Publishers.
2. Lucas J. Stal, Mariana Silvia Cretoiu. (2022). The Marine Microbiome. 1st Edition. Springer Nature.
3. Aparna Gunjal, Sonali Shinde. (2021). Microbial Diversity and Ecology in Hotspots. 1st Edition. Elsevier Science.
4. Milton Fingerman. (2020). Recent Advances in Marine Biotechnology. 1st Edition. CRC Press Publishers.

Web References

1. <https://ocean.si.edu/ocean-life/microbes/marine-microbes>
2. <https://www.slideshare.net/LeiramSejram/marine-habitats>
3. <https://byjus.com/biology/biogeochemical-cycles/>
4. <https://www.slideshare.net/SudheerKandibanda/marine-drugs-56601492>
5. <https://www.slideshare.net/ShaiikhMuzahim/marine-nutraceuticals>
6. <https://byjus.com/free-ias-prep/marine-pollution/>
7. http://www.marinebiotech.eu/wiki/Bioremediation_of_marine_ecosystems

Pedagogy

Chalk and Talk, Assignment, Seminar and Group Discussion.

Course Designer

Dr. S. Jenny

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY – 18.

DEPARTMENT OF BIOTECHNOLOGY
BOARD OF STUDIES

MINUTES OF THE MEETING HELD ON TUESDAY, 11th OCTOBER, 2022
AT 10.30am

The following members attended the meeting:

- | | |
|------------------------------|----------------------------------|
| 1. Dr. A. Veera Ravi | Subject Expert, Other University |
| 2. Dr. P. Ravichandran | Subject Expert, Other University |
| 3. Dr. S. Sivaramakrishnan | University Nominee |
| 4. Dr. Umashankar Ponnusamy | Industry Expert |
| 5. Dr. Pushpavalli Raju | International Academic Expert |
| 6. Ms. A. Yamuna | Member Alumna |
| 7. Ms. Aishwarya Suresh Nair | Student Representative |
| 8. Ms. G. Swethaa Shri | Student Representative |
| 9. Dr. R. Rameshwari | Chairperson & Head |
| 10. Ms. P. Ilamathy | Member |
| 11. Ms. R. Nevetha | Member |
| 12. Dr. R. Uma Maheswari | Member |
| 13. Ms. P. Jenifer | Member |
| 14. Dr. G. Gomathi | Member |
| 15. Dr. M. Keerthiga | Member |

The Agenda for the meeting was as follows:

1. ITEM NO. BoS/07/01

- To consider and approve the Programme structure of B.Sc., Biotechnology for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirapalli – 18.

2. ITEM NO. BoS/07/02

- To consider and approve the second semester syllabus of B.Sc., Biotechnology for 2022 -2023 batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirapalli – 18.

3. ITEM NO. BoS/07/03

- Ratification to include Unit VI – Self Study for Enrichment in all the courses in semester I of B.Sc., Biotechnology for 2022 – 2023 batch and onwards.

4. ITEM NO. BoS/07/04

- To consider and approve the ratification of Skill Based Elective – III Lab in Plant Tissue Culture (19UBT5SBE3BP) is revised as Lab in Plant Tissue Culture and Environmental Biotechnology (22UBT5SBE3BP) in the fifth semester syllabus for the batch 2021– 2022 of B.Sc., Biotechnology and recommend to Academic Council, Cauvery College for Women (Autonomous), Trichy -18.

5. ITEM NO. BoS/07/05

- To include Internship as extra credit course in semester V of B.Sc., Biotechnology for the batch 2021 – 2022 and onwards and recommend to Academic Council, Cauvery College for Women (Autonomous), Trichy -18.

Minutes of seventh meeting of the BoS

The minutes of the meeting is as follows:

Dr.R.Rameshwari, welcomed the members for attending the seventh meeting of Board of studies (UG) and introduced the members. Discussion based on the agenda were carried out.

Resolution No. BoS/07/01

Board of Studies members considered and approved the Programme structure of B.Sc., Biotechnology for 2022 -2023 batch and onwards and recommended to the Academic

Council, Cauvery College for Women (Autonomous), Tiruchirapalli – 18. with the following changes:

Dr. A. Veera Ravi suggested the following:

- Core theory and Allied theory should have its corresponding practical in the same semester.
- In IV Semester, Second Allied Course-III Plant Physiology paper can be removed and can be replaced with any Biotechnology course.

Dr. S. Sivaramkrishnan suggested the following:

- Hours should match with its credits in the entire programme structure uniformly.
- In IV Semester, Second Allied Course-III Plant Physiology paper can be removed and can be replaced with any Biotechnology related course.
- In VI Semester, Microbial Biotechnology can be converted to Microbial and Environmental Biotechnology.

Dr.P.Ravichandran suggested the following:

- Appreciated for Swayam Online Course.

Dr. Umashankar Ponnusamy suggested the following:

- Seminars can be included with credit hours during V and VI semester.

Ms. A.Yamuna suggested the following:

- In IV Semester, Second Allied Course-III Plant Physiology paper can be removed and can be replaced with any Biotechnology related course.

Resolution No. BoS/07/02

Board of Studies members considered and approved the second semester syllabus of B.Sc., Biotechnology for 2022 -2023 batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirapalli – 18 with the following changes:

Panel members suggested the following changes:

Dr.P.Ravichandran suggested the following:

- In Molecular Biology & Genetics Practical course, Experiment No-11: Observation of simple Mendelian traits in man should be modified as Observation of simple Mendelian traits among Human.
- In 13th Experiment of Molecular Biology & Genetics Practical, Karyotyping with photographs can be included.
- In Bioinstrumentation Core Course, Unit I –Inverted Microscope could be replaced with Confocal Microscope
- In Skill Based Elective III (B) Lab in Plant Tissue Culture & Environmental biotechnology -Laboratory rules and Regulation can be removed.

Dr. Umashankar Ponnusamy suggested the following:

- Hands on experience can be included for most of the practical courses.
- Online courses through Coursera would expose the students to latest technologies from experts globally.

Dr. Pushpavalli Raju suggested the following:

- CSIR NET related exam syllabus would be better for higher Education

Ms. A.Yamuna suggested the following:

- In 11th Experiment of Molecular Biology & Genetics, Observation of simple Mendelian traits in man should be modified as Observation of simple Mendelian traits among Human.

Ms. Aishwarya Suresh Nair suggested the following:

- In 11th Experiment of Molecular Biology & Genetics, Observation of simple Mendelian traits in man should be modified as Observation of simple Mendelian traits among Human.

Ms. G. Swethaa Shri suggested the following:

- Internship can be included for their batch (2020-2023)

REVISION OF CORE COURSE – III: BIOINSTRUMENTATION

Unit – I:

Inverted Microscope, Electron microscopy: HR-TEM, FE- SEM were included.

Unit – II: Pulsed Field Gel Electrophoresis, Immunoelectrophoresis; were included
Blotting Techniques were reduced.

Unit III

LC-MS was included. Chromatography was reduced

Unit IV

FTIR was included

Unit V

Ultracentrifugation was included.

Resolution No. BoS/07/03

Board of Studies members considered and approved the ratification to include Unit VI – Self Study for Enrichment in all the courses in semester I of B.Sc., Biotechnology for 2022 – 2023 batch onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Tiruchirapalli – 18.

Resolution No. BoS/07/04

Board of Studies members considered and approved the ratification of Skill Based Elective –III Lab in Plant Tissue Culture (19UBT5SBE3BP) is revised as Lab in Plant Tissue Culture and Environmental Biotechnology (22UBT5SBE3BP) in the fifth semester syllabus for the batch 2021– 2022 of B.Sc., Biotechnology and recommended to Academic Council, Cauvery College for Women (Autonomous), Trichy -18.

Dr. A. Veera Ravi suggested the following:

- In Skill Based Elective III (B) Lab in Plant Tissue Culture & Environmental biotechnology Laboratory rules and Regulation can be removed.

Dr.P.Ravichandran suggested the following:

- In Skill Based Elective III (B) Lab in Plant Tissue Culture & Environmental biotechnology - Laboratory rules and Regulation can be removed.

Resolution No. BoS/07/05

Board of Studies members suggested to include Internship as extra credit course in semester V of B.Sc., Biotechnology for the batch 2021 – 2022 and onwards and recommended to Academic Council, Cauvery College for Women (Autonomous), and Trichy 18.

Finally, Dr. R. Rameshwari, Chairperson & Head, Department of Biotechnology thanked the members of the Board of Studies for rendering support.

The Board of Studies meeting was resolved and concluded by recommending the Programme structure and the syllabus of second Semester of B.Sc., Biotechnology (2022 – 2023 onwards) and the ratification to include Unit –VI Self study for Enrichment in all the courses in semester I of B.Sc., Biotechnology (2022 – 2023 onwards) and the ratification of Skill Based Elective III- Lab in Plant Tissue Culture (19UBT5SBE3BP) is revised as Lab in Plant Tissue Culture and Environmental Biotechnology (22UBT5SBE3BP) in fifth semester syllabus for the batch 2021– 2022 of B.Sc., Biotechnology and recommend to Academic Council, Cauvery College for Women (Autonomous), Trichy -18. Further, Internship was included as extra credit course in semester V of B.Sc., Biotechnology for the batch 2021 – 2022 and onwards were approved and recommended to Academic Council, Cauvery College for Women (Autonomous), Trichy -18.



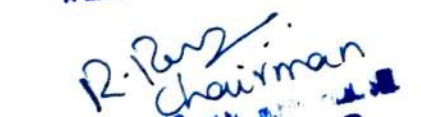
**DEAN OF SCIENCE
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU**



**Dr. S. SIVARAMAKRISHNAN
HEAD
Dept. of Biotechnology and Genetic Engineering
School of Biotechnology
Bharathidasan University
Tiruchirappalli - 620 024.**



**Dr. A. Veera Ravi
Professor
Department of Biotechnology
Atagappa University
Science Campus
Karaikudi - 630 003**



**Dr. R. RAMESHWARI, M.Sc., M.Phil., Ph.D.
Chairman
ASSISTANT PROFESSOR
DEPARTMENT OF BIOTECHNOLOGY
CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
TIRUCHIRAPPALLI - 620 018**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
NATIONALLY ACCREDITED (III CYCLE) WITH “A” GRADE BY NAAC
ISO 9001:2015 CERTIFIED
TIRUCHIRAPPALLI – 620 018

DEPARTMENT OF BIOTECHNOLOGY



B.Sc., BIOTECHNOLOGY
SYLLABUS
2022 – 2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF BIOTECHNOLOGY

VISION

- To educate a broad range of basic lab skills applicable to biology and biotechnology.
- Make the students know and understand broad range of basic biological concepts and can apply and analyse these in at least one specialty area.
- Make the students generate a hypothesis, design approaches to test them and interpret the data from those tests to reach valid conclusions.
- To develop the ability to place their own works in a broader scientific context.

MISSION

- To produce ambitious, creative graduates who are interested in continuing their education in biosciences.
- Make the students to read and critically evaluate the original scientific literature.
- To produce responsible biotechnology professionals to fulfill the employment and research needs in the biotechnology industry.
- Enhance the student's ability to integrate their acquired computer and biosciences knowledge and skills to investigate and solve the biological problems.
- To create opportunities for placement in leading industries through Internships.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO 1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO 2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash students hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO 3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO 4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO 5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc., BIOTECHNOLOGY PROGRAMMES

PO NO	On completion of B.Sc., Biotechnology Programme, the students will be able to
PO 1	Academic Excellence and Competence: Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in the future.
PO 2	Holistic and Social approach: Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable environmental practices as well as social issues.
PO 3	Professional ethics and Teamwork: Explore professional responsibility through projects, internships, field trips/industrial visits and mentorship programmes to transmit communication skills.
PO 4	Critical and Scientific thinking: Equip training skills in Internships, Research Projects to do higher studies in multidisciplinary paths with a higher level of specialization to become professionals of high - quality standards.
PO 5	Social Responsibility with ethical values: Ensure ethical, social and holistic values in the minds of learners and attain gender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc., BIOTECHNOLOGY

PSO NO	The students of B.Sc., Biotechnology will be able to	POs Addressed
PSO 1	Acquire knowledge of biological sciences with the implementation of technology on different living systems like plants, animals and microbes.	PO1 PO 2
PSO 2	Explain the fundamental concepts and develop skills in Immunology, Developmental biology, Nanobiotechnology, Genomics, Proteomics, Bioinformatics, Agriculture and Medicine	PO 1 PO 2
PSO 3	Apply the technical aspects related to the improvement of microbes, plants and live-stocks for the welfare of human and environment.	PO 2 PO 4
PSO 4	Impart hands-on techniques in various thrust areas of biotechnology to meet the emerging demands in industry, academia and research.	PO 2 PO 4
PSO 5	Gaining knowledge to transform theoretical concepts to practical products/process to move ahead in entrepreneurship and apply the laws concerning to IPR and bioethics	PO 2 PO 3 PO 5



Cauvery College for Women (Autonomous), Trichy -18

Department of Biotechnology

B.Sc., Biotechnology

Learning Outcome Based Curriculum Framework (CBCS - LOCF)

(For the Candidates admitted from the Academic year 2022-2023 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course-I (LC)	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100
			Hindi Literature & Grammar – I	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
			Basic French – I	22ULF1						
	II	English Language Course- I (ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Cell Biology	22UBT1CC1	5	5	3	25	75	100
			Cell Biology (P)	22UBT1CC1P	3	3	3	40	60	100
			General Microbiology	22UBT1AC1	4	3	3	25	75	100
			Biochemistry	22UBT1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal- Universal Human Values	22UGVE	2	2	-	100	-	100
Total					30	22				700
II	I	Language Course - II (LC)	Idaikkala Ilakkiyamum Pudnamum	22ULT2	5	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Poetry, Textual Grammar and Alakara	22ULS2						
			Basic French – II	22ULF2						
	II	English Language Course - II (ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Molecular Biology & Genetics	22UBT2CC2	5	5	3	25	75	100
			Molecular Biology & Genetics (P)	22UBT2CC2P	3	3	3	40	60	100
			Bioinstrumentation	22UBT2CC3	3	3	3	25	75	100
			Microbiology & Biochemistry (P)	22UBT2AC3P	4	3	3	40	60	100
			Environmental Studies	22UGEVS	2	2	-	100	-	100
	Ability Enhancement Compulsory Course-II (AECC)									
	Ability Enhancement Compulsory Course-III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
	Extra Credit Course			SWAYAM	As per UGC Recommendation					
Total					30	23				800

III	I	Language Course-III (LC)	Kappiyamum Nadagamum	22ULT3	5	3	3	25	75	100	
			Hindi Literature & Grammar – III	22ULH3							
			Prose, Textual Grammar and Vakyarachana	22ULS3							
			Intermediate French – I	22ULF3							
	II	English Language Course-III(ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3	25	75	100	
	III	Core Course– IV(CC)	rDNA Technology	22UBT3CC4	6	6	3	25	75	100	
		Core Practical - III(CP)	rDNA Technology(P)	22UBT3CC3P	3	3	3	40	60	100	
		Second Allied Course-I (AC)	Bioinformatics	22UBT3AC4	4	3	3	25	75	100	
		Second Allied Course- II (AP)	Bioinformatics (P)	22UBT3AC5P	4	3	3	40	60	100	
	IV	Generic Elective Course- I (GEC)	Basics of Biotechnology	22UBT3GEC1	2	2	3	25	75	100	
			Basic Tamil -I	22ULC3BT1							
			Special Tamil - I	22ULC3ST1							
		Extra Credit Course	SWAYAM	As per UGC Recommendation							
	Total			30	23					700	

15 Days INTERNSHIP during Semester Holidays*

IV	I	Language Course – IV (LC)	Pandaiya Ilakkiyamum Urainadayum	22ULT4	6	3	3	25	75	100	
			Hindi Literature & Functional Hindi	22ULH4							
			Drama, History of Drama Literature	22ULS4							
			Intermediate French – II	22ULF4							
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature – II	22UE4	6	3	3	25	75	100	
	III	Core Course – V(CC)	Immunology	22UBT4CC5	6	6	3	25	75	100	
		Core Practical - IV(CP)	Immunology (P)	22UBT4CC4P	4	4	3	40	60	100	
		Second Allied Course - III (AC)	Basics of Forensic Biology	22UBT4AC6	4	3	3	25	75	100	
		Internship*	Internship	22UBT4INT	-	2	-	-	-	100	
	IV	Generic Elective Course- II (GEC)	Applied Biotechnology	22UBT4GEC2	2	2	3	25	75	100	
			Basic Tamil – II	22ULC4BT2							
			Special Tamil - II	22ULC4ST2							
		Skill Enhancement Course – I (SEC)	Fundamentals of Nanotechnology (P)	22UBT4SEC1P	2	2	3	40	60	100	
	Extra Credit Course	SWAYAM	As per UGC Recommendation								
	Total			30	25					800	

V	III	Core Course – VI(CC)	Plant Biotechnology	22UBT5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Plant & Animal Biotechnology (P)	22UBT5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Animal Biotechnology	22UBT5CC7	6	6	3	25	75	100
	Core Course – VIII(CC)	Biostatistics	22UBT5CC8	6	6	3	25	75	100	
	Discipline Specific Elective – I (DSE)	A. Cancer Biology	22UBT5DSE1A	5	4	3	25	75	100	
		B. Human Anatomy, Physiology and Pharmacology	22UBT5DSE1B							
		C. Pharmacognosy	22UBT5DSE1C							
	IV	Ability Enhancement Compulsory Course – IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Medical Lab Technology (P)	22UBT5SEC2P	2	2	3	40	60	100
	Extra Credit Course		SWAYAM	As per UGC Recommendation						
Total				30	29					700
VI	III	Core Course – IX (CC)	Microbial & Environmental Biotechnology	22UBT6CC9	6	6	3	25	75	100
		Core Practical –VI (CP)	Microbial & Environmental Biotechnology (P)	22UBT6CC6P	3	3	3	40	60	100
		Core Course – X (CC)	IPR, Biosafety and Bioethics	22UBT6CC10	5	5	3	25	75	100
		Core Course – XI (CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Discipline Specific Elective – II (DSE)	A. Developmental Biology	22UBT6DSE2A	5	4	3	25	75	100
	B. Stem cell Biology		22UBT6DSE2B							
	C. Bioentrepreneurship		22UBT6DSE2C							
	Project	Project Work	22UBT6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
Total				30	28					700
Grand Total				180	150					4400

Cauvery College for Women (Autonomous), Trichy -18
Courses & Credits for UG Biotechnology Programme

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	17	77	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		4400	150	150

Semester – I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT1CC1	CELL BIOLOGY	CORE	5	5

Course Objectives

- To study about the basic concepts of cells and their cellular organelles and their functions.
- To study the specialized cells.
- To study about cell cycle and its regulations.
- To study cell signaling pathways

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Relate and explain the basics of cell biology, types, structure, and properties of cells.	K1, K2
CO2	Apply the knowledge of cell biology in diverse research areas.	K3
CO3	Illustrate the Ultra structure and list the functions of cellular organelles in various types of cells	K2, K4
CO4	Explain the significance of cells and specialized cells	K5
CO5	Interpret the concepts of cell, cell division, compartmentalization, transport of nutrients and cell signalling in different types of cells.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	1	3	1
CO2	3	2	2	2	1	3	1	1	2	2
CO3	3	1	1	3	1	3	3	2	1	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,

“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Fundamentals of cell structure: Cell as basic unit of life: Basic properties of cells, cell theory, cell morphology, Ultrastructure - Prokaryotic and Eukaryotic cells. Cell wall: Structural organization; Cytoskeleton: Microtubules and intermediate filaments; Cell Motility – Flagella.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Cellular membranes and matrices: Cell Membrane: Plasma Membrane – Fluid Mosaic Model and Sandwich Model; Chemical composition and fluidity of membranes; transport of nutrients - diffusion, facilitated diffusion and osmosis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Endomembrane System: Ultrastructure and functions: Nucleus; Endoplasmic Reticulum - Rough and Smooth; Golgi Complex, Ribosomes - Types and functions; Mitochondria - Ultrastructure, Chemical Composition and functions; Chloroplast - Ultrastructure, Chemical Composition and functions; Microbodies: Types - Peroxisomes, Glyoxisomes and Lysosomes - Types, structure and function.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Cell Division and Signaling: Cell division in prokaryotes and eukaryotes: Cell cycle, mitosis, meiosis, crossing over; Apoptosis; Signal transduction - Cell to cell recognition.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Specialized cells: Motile cells (amoeboid and Sperm cells), nerve cells and nerve impulse conduction, muscle cells and muscle contraction and Egg cells.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self Study for Enrichment (Not included for End Semester Examination) Discovery of Cells, Cytoskeleton - Microfilaments, Types of Microbodies, Cell adhesion and Red Blood Cells.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Veer Bala, R. (2021). *Cell Biology*. Latest edition. Med tech.
2. Rastogi, S. C. (2020). *Cell and Molecular Biology*. New Age International Private Ltd.
3. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Karen, H., Dennis, B., & Walter, P. (2019). *Essential Cell Biology*. 5th International Student Edition. Garland Science.
4. De Robertis, E.D.D. & De Robertis, E.M.F. (2017). *Cell & Molecular Biology*. 8th Edition. Waverly.
5. Verma, P. S. & Agarwal, V. K. (2016). *Cell Biology*. S. Chand Publication.

Reference Books

1. Cooper, G.M. & Hausman, R.E. (2018 Reprint). *The Cell A Molecular Approach*. 6th Edition. Ingram Publication.
2. Griffith, R. (2017). *Cell biology (Meiosis & Mitosis)*. Larsen and Keller Education.
3. Thomas, D. P., William, C. E., Jennifer, L. S. & Graham, J. (2017). *Cell Biology*. 3rd Edition. Elsevier IE (short Disc).
4. Alberts, B., Johnson, A., Lewis, J., Raff, M., Roberts, K., Karen, H., Dennis, B. & Walter, P. (2017). *Molecular Biology of Cell*. 6th Edition. Garland Science, Taylor & Francis group.
5. Hardin, J., Bertoni, G.P. & Kleinsmith, L.J. (2017). *Becker's World of the Cell*. Pearson Education.

E - Books

1. <https://open.umn.edu/opentextbooks/textbooks/244>
2. http://standing.weebly.com/uploads/2/3/3/5/23356120/8_-_unit_30c.pdf
3. <https://www.infobooks.org/free-pdf-books/biology/cell-biology/>
4. <http://www.freebookcentre.net/Biology/Cell-Biology-Books.html>;
5. https://tripurauniv.ac.in/Page/SubjectWiseOnline_EBooks_Cell_Molecular_Biology

Web Reference

1. <https://ocw.mit.edu/courses/7-06-cell-biology-spring-2007/>
2. <https://sciencewiz.com/portals/cells/tour-inside-the-cell/a-tour-of-the-cell-more-advanced/>
3. <http://naturedocumentaries.org/17217/virtual-tour-cell-xvivo-scientific-animation-2018/>
4. <https://nptel.ac.in/courses/102103012>

Pedagogy

Chalk and Talk, PPT, Videos and Animations

Course Designers

1. Ms. P. ILAMATHY
2. Dr. S. ABINAYA

Semester – I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT1CC1P	CELL BIOLOGY (P)	CORE	3	3

Course Objectives

- To perform experiments using microscopes and micrometry.
- To study about cells and their morphology by appropriate techniques.
- To gain knowledge in cell division and their stages.
- To perform experiments on cell counting and viability.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Define and describe the basic instruments involved in Biology.	K1, K2
CO 2	Discuss and differentiate the morphology of various types of cells.	K2
CO 3	Classify and illustrate the different cell organelles.	K3
CO 4	Categorize the different types and stages of cell division.	K4
CO 5	Illustrate and conclude cell viability and counting.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	2	3	3	1
CO2	3	3	3	3	2	3	2	3	3	1
CO3	3	2	3	3	2	3	2	3	3	1
CO4	3	2	3	3	1	3	2	2	3	1
CO5	3	3	3	3	1	3	2	2	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

Syllabus

1. Laboratory rules, regulations and safety measures.
2. Demonstration of Principles and working mechanism of Light Microscope.
3. Principles and working mechanism of rotary Microtome (Demo).
4. Measurement of Cell Size by Micrometry.
5. Prokaryotic Cell Observation – *E. coli*.
6. Eukaryotic Cell Observation – Yeast and Onion.
7. Morphological Characterization of various types of Plant tissue cells.
8. Separation of cell organelles by centrifugation method.
9. Barr body identification from Buccal Smear.
10. Cell Division - Mitotic stages.
11. Cell Division - Meiotic stages.
12. Cell Division - Binary fission of Yeast Cells.
13. Enumeration of Eukaryotic Cells (Yeast), Red Blood Cells and White Blood Cells.
14. Assessment of Cell Viability by trypan blue staining.
15. Experiment on Osmosis.

Reference Books

1. Gupta, R., Seema, M. & Ravi, T. (2018). *Cell Biology: Practical Manual*. Prestige Publishers.
2. William, H. H. (2017). *Cell Biology: Laboratory Manual*, Pearson Education.
3. Amit, G. & Bipin Kumar, S. (2019). *Practical Laboratory Manual – Cell Biology*. Lambert Academic Publishing.
4. Thompson, D. A. (2011). *Cell and Molecular Biology Lab. Manual*. Create Space Independent Publishing Platform.
5. Mary, L. L. (1993). *Cell Biology: Laboratory Manual*. Ron Jon Publishing Incorporated.

E - Books

1. https://www.bjcancer.org/Sites_OldFiles/Library/UserFiles/pdf/Cell_Biology_Laboratory_Manual.pdf
2. http://www.ihcworld.com/protocols/lab_protocols/cell-biology-lab-manual-heidcamp.htm
3. https://www.deanza.edu/faculty/heyerbruce/b6b_pdf/Bio6B-Manual_W19.pdf
4. https://www.researchgate.net/publication/330654692_Cell_Biology_Practical_Manual
5. <https://www.pdfdrive.com/cell-biology-protocols-d13735633.html>

Pedagogy

Practical Observation and Demo

Course Designers

1. **Dr. R. UMA MAHESWARI**
2. **Dr. G. GOMATHI**

Semester – I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT1AC1	GENERAL MICROBIOLOGY	ALLIED	4	3

Course Objective

- To create basic knowledge on the History and classification of Microorganisms.
- To study the structure and characteristics of microorganisms like bacteria, algae, fungi, protozoa and virus.
- To study the media composition and their types.
- To study the microbial diseases, pathogenesis, diagnosis and preventive measures.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO 1	Recall and infer the factual and conceptual information required for understanding microbiology.	K1, K2
CO 2	Illustrate the different structural organization of bacteria, Algae, Fungi, protozoa and virus.	K2
CO 3	Develop the different microbial culture media for isolation of microbes and Compare the lifecycle of bacteria, algae, fungi, protozoa and virus.	K3, K4
CO 4	Classify the different kind of microbes (Classification) and explain the general characteristic features of the Algae, Fungi, protozoa and virus.	K4, K5
CO 5	Elaborate the diagnostic methods and controlling measures of various pathogenic microbial diseases for the human welfare.	K6

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	3	3	2	3	1	1	2	3
CO2	3	1	3	2	3	2	2	1	1	3
CO3	2	1	2	2	1	2	2	2	3	3
CO4	2	1	2	2	2	1	1	2	2	3
CO5	3	1	3	3	3	3	3	3	3	3

“1”-Slight (Low) Correlation, “2”- Moderate (Medium) Correlation,
“3”-Substantial (High) Correlation “-” - indicates no Correlation

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Historical development of Microbiology – Theories of Spontaneous generation – Biogenesis. General principles and nomenclature – Bergey's Manual of Determinative Bacteriology, Whittaker's five kingdom concept- Carl Woese's three domain classification. Cavalier – Smith's Eight kingdom classification.	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
II	Media Composition and their types based on physical state & ingredients. Microbial Growth-Factors influencing the growth of Microorganisms – Growth Curve.	10	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
III	Structural organization of bacteria – Size, shape and arrangement of bacterial cells – Ultrastructure of a bacterial cell. Size & Morphology of Virus; Viroids. Lifecycle – Lytic & Lysogenic. Morphology & Anatomy of Protozoa - Amoeba & Paramecium.	12	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
IV	General characteristics of Algae (<i>Chlamydomonas sp.</i>) including occurrence, thallus organization, Ultra structure, pigments, eyespot, food reserves. Reproduction – Sexual and Asexual reproduction. Fungi (<i>Aspergillus sp.</i>) – General characteristics of fungi including habitat, distribution, nutritional requirements, Ultrastructure, thallus organization and aggregation.	13	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
V	General account on Microbial diseases - Causative Organism, Pathogenesis, Epidemiology, Diagnosis, Prevention & Control. Bacterial Diseases: Typhoid & Tuberculosis. Fungal diseases: Candidiasis & Aspergillosis. Viral Diseases: Hepatitis, AIDS. Protozoan Diseases: Malaria & Amoebiasis.	13	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6
VI	Self - Study for Enrichment (Not included for End Semester Examination) Scope of Microbiology, Types of Sterilization, Size and morphology of Virus – Prions, Ultrastructure of Flagella and Corona Virus	-	CO1, CO2, CO3, CO4, CO5	K1, K2 K3, K4, K5, K6

Text Books

1. Barry, C. (2020). *Talaro's Foundations in Microbiology*. 11th Edition. Mc Graw Hill.
2. Rajan, S. & Selvi Christy, R. (2020). *Essentials of Microbiology*. CBS Publishers Pvt. Ltd.
3. Ananthanarayan, R. & Paniker, C.K.J. (2020). *Textbook of Microbiology*. 11th Edition. Orient Blackswan Pvt. Ltd.
4. Gerarad, J.T., Berdell, R.F. & Christine, L.C. (2018). *Microbiology - An Introduction*. 11th Edition. Pearson.
5. Robert, W. B. (2017). *Microbiology with Diseases by taxanomy*. 4th Edition. Pearson.
6. Dr. Baveja, C. P. (2017). *Text Book of Microbiology*. Anja Publications.

Reference Books

1. Apurba, S. S. & Sandhya, B. (2021). *Essentials of Medical Microbiology*. 3rd Edition. Jaypee Brothers.
2. Willey, J.M., Kathleen, M.S. & Dorothy, H.W. (2019). *Prescott's Microbiology*. Mc GrawHill.
3. Gerarad, J.T., Berdell, R.F. & Christine, L.C. (2018). *Microbiology: An Introduction*. 13th Edition. Pearson.
4. Madigam, M.T., Bender, K.S., Buckley, D.H., Sattley, W.M. & Stahl, D.A. (2017). *Brock Biology of Microorganism*. 15th Edition. Pearson Education.
5. Rathoure, A.K. (2017). *Essentials of Microbiology*. Brillion Publishing.

E – Books

1. <https://www.pdfdrive.com/essentials-of-medical-microbiology-e33538815.html>
2. <https://www.pdfdrive.com/medical-microbiology-e18737002.html>
3. <https://www.pdfdrive.com/textbook-of-microbiology-and-immunology-e175896260.html>
4. <https://www.pdfdrive.com/sherris-medical-microbiology-d193153850.html>
5. <https://www.pdfdrive.com/oxford-handbook-of-infectious-diseases-and-microbiology-d158084200.html>
6. <https://www.pdfdrive.com/microbiology-with-diseases-by-body-system-d185840565.html>

Web References

1. <https://nptel.ac.in/courses/102103015>
2. <http://ecoursesonline.iasri.res.in/course/view.php?id=108>
3. <https://www.digimat.in/nptel/courses/medical/microbiology/MB11.html>
4. <https://www.iaritoppers.com/2019/06/fundamentals-of-microbiology-icar-ecourse-pdf-book-download.html>
5. <https://microbiologysociety.org/why-microbiology-matters/what-is-microbiology/microbes-and-the-human-body/microbes-and-disease.html>

Pedagogy

Chalk and talk, PPT, Group Discussion, Assignment, Demo, Quiz, Seminar

Course Designers

1. Ms. P. JENIFER
2. Dr. M. KEERTHIGA

Semester – I	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT1AC2	BIOCHEMISTRY	ALLIED	4	3

Course Objectives

- To study the basics of biomolecules.
- To study classification, structure and functional properties of carbohydrates, proteins, lipids, vitamins and minerals.
- To study the impact of proteins and enzymes.
- To study vitamin deficiency diseases.

Course Outcome and Cognitive Level Mapping

Upon the Successful completion of the course the student would be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand and remember the chemistry and salient features of macromolecules	K1, K2
CO2	In depth knowledge about the properties and significance of the biomolecules	K2
CO3	Explain and differentiate the relationship between different kinds of biomolecules such as carbohydrates, lipids, nucleic acid and proteins.	K2, K4
CO4	Classify and demonstrate the various sources and functions of the nutrients. Calorific value of food.	K3, K4
CO5	Evaluate and analyze the concept of nutrition in health and disease, with metabolism and functions of a living system	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	1	3	2	1	2	1
CO2	3	2	2	1	1	3	2	1	1	1
CO3	3	2	2	1	1	3	2	2	2	1
CO4	3	2	3	2	2	3	3	2	2	2
CO5	3	2	3	2	2	3	3	3	2	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Carbohydrates: Definition, structure, classification and functions of carbohydrates - Monosaccharides: Glucose and Fructose. Disaccharides: Sucrose and Maltose, Oligosaccharides: Raffin. Polysaccharides: Starch and Glycogen. Physical and chemical properties of carbohydrates.	12	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
II	Lipids: Definition, classification and importance of lipids - Simple lipids: Triglycerides, Compound lipids: Phosphatides and Derived lipids: Cholesterol. Structure and functions of glycerol, phospholipids, glycolipids and lipoproteins. Physical and chemical properties of lipids.	12	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
III	Amino acids: Introduction, structure and classification of amino acids - Essential amino acids, Semi - essential amino acids, Non-essential amino acids and carboxyl groups of amino acids. Physico-chemical properties of amino acids. Functions of amino acids.	12	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
IV	Proteins: Definition and classification based on shape, composition, solubility and functions of proteins. Structure of proteins - Primary, secondary, tertiary and quaternary structure - protein folding. Structure, classification and properties of enzymes. Mechanism of enzyme activity. Enzyme inhibition - Competitive, non-competitive and uncompetitive inhibition.	12	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
V	Vitamins and Minerals: Vitamins: Definition and Classification. Fat soluble vitamins - sources, structure and physiological functions; Water soluble vitamins - sources, structure and physiological functions. Vitamin deficiency diseases (Scurvy and Rickets). Minerals: Macro minerals and micro minerals - sources and functions.	12	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
VI	Self-Study for Enrichment: (Not Included for External Examination) Oligosaccharides – Stachyose, Structure and functions of – sphingolipids, importance of amino acids, Protein – denaturation and Vitamin deficiency diseases - Anemia.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Singh, S. P., & Singh, A. N. (2021). *Textbook of Biochemistry*. CBS Publications.
2. Gupta, S. N. (2020). *Concepts of Biochemistry*. Rastogi Publications.
3. Sathyanarayana, U., and Chakrapani, U. (2020). *Biochemistry*. 5th Edition. Elsevier India.
4. Seema, P. U. (2020). *Textbook of Biochemistry*. 1st Edition. Dreamtech Press.
5. Padmaja H. A., Dr.Yogesh, K. & Dr. Rammohan R. (2019). *Biochemistry*. Nirali Prakashan Publications.
6. Denise, R.F. (2017). *South Asian Edition of Lippincott Illustrated Reviews Biochemistry*. 7th Edition. Wolters Kluwer Publications.

Reference Books

1. Manzoor, M. M. (2021). *Fundamentals of Biochemistry*. Lambert Academic Publishing (LAP).
2. Voet, D. & Voet, J.G.(2021). *Voet's Biochemistry*. Adapted Edition 2021. Wiley India.
3. Brailsford, R. T. (2020). *Principles of Biochemistry*. MJP Publisher.
4. Jeremy M., Berg, Lubert, S., John, T., Gregory, G. (2019). *Biochemistry*. Freeman and Company publications.
5. Appling D.R., Anthony-Cahill, S. J., Mathews, C. K. (2017). *Biochemistry: Concepts and Connections*. Pearson Education.
6. Vikrant, V. (2021). *Biochemistry*. Discovery Publishing House Pvt Ltd.

E-Books

1. <https://www.pdfdrive.com/lehninger-principles-of-biochemistry-d158404366.html>
2. <https://www.pdfdrive.com/biochemistry-d196362531.html>
3. <https://www.pdfdrive.com/biochemistry-genetics-molecular-biology-d18198970.html>
4. <https://www.pdfdrive.com/biochemistry-biochemistry-e19576202.html>
5. <https://www.pdfdrive.com/marks-basic-medical-biochemistry-a-clinical-approach-5th-edition-e158491166.html>

Web References

1. <http://ecoursesonline.iasri.res.in/course/view.php?id=422>
2. <https://nptel.ac.in/courses/102105034/>
3. <https://youtu.be/DhwAp6yQHQI>
4. <https://sites.google.com/a/uasd.in/ecourse/biochemistry> <https://youtu.be/f7jRpniCsaw>
5. <https://agrimoon.com/fundamentals-of-biochemistry-pdf-book/>

Pedagogy

Blackboard, PPT, Videos, Animations, Group Discussion and Quiz.

Course Designer

Ms. M. AZEERA

Semester I	Internal Marks: 25	External Marks: 75		
COURSE CODE	COURSE TITLE	CATEGORY	Hours/Week	CREDITS
22UGVE	UNIVERSAL HUMAN VALUES	Part IV	2	2

COURSE OBJECTIVES

1. To enable the learners to learn the values of love and compassion.
2. To foster the values of righteousness and service among the learners.
3. To enhance the morale of the learners by inculcating the values renunciation and peace.
4. To inspire the learners to practice the basic human values so as to make them become responsible citizens of the Nation.

COURSE OUTCOMES AND COGNITIVE LEVEL MAPPING

CO Number	CO Statement On the successful completion of this course, the students will able to	Cognitive Level
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth and Non - Violence	K2
CO3	Explain the value of Righteousness and Service	K3
CO4	Practice the values of Renunciation (sacrifice) & Peace	K4
CO5	Prioritize Human Values in their day today life	K5

Syllabus

Unit I: (6 Hours)

Love and Compassion

- **Introduction:** what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness
- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore

Unit II : (7 Hours)

Truth and Non - Violence

- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- **Introduction:** what is non violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non violence
- Ahimsa as non -violence and non- killing.

- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore

Unit III : (6 Hours)

Righteousness and Service

- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service
- Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore

Unit IV : (6 Hours)

Renunciation (sacrifice) & Peace

- Introduction: what is renunciation? Renunciation and sacrifice. Self restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace

Unit V : (5 Hours) Practicing human values

- What will learners learn/gain if they practice human values? What will learners lose if they Don't Practice human values?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies

Pedagogy: Chalk & Talk, Seminar, PPT Presentation, Group Discussion, Blended Method, and Case Study.

Course Designer : Dr.G.Mettilda Buvaneswari

Semester – II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT2CC2	MOLECULAR BIOLOGY & GENETICS	CORE	5	5

Course Objectives

- To study the basics of Genetics and molecular biology.
- To study about laws and concepts of Mendelian inheritance.
- To study the process of DNA replication, transcription, and translation process.
- To study Gene expression, post-transcriptional and post-translational modifications

Course Outcome and Cognitive Level Mapping

Upon the Successful completion of the course the student would be able to

CO Number	CO Statement	Cognitive Level
CO1	Understand and remember chemistry and salient features of DNA and the concepts of inheritance.	K1, K2
CO2	In-depth knowledge of the mendelian laws, sex determination, replication, transcription and translation.	K2
CO3	Explain and differentiate the process of DNA replication, transcription and translation between prokaryotes and Eukaryotes.	K2, K4
CO4	Compare and distinguish the laws of segregation, law of independent assortment, linkage, multiple alleles, and Eukaryotic and prokaryotic gene expression.	K3, K4
CO5	Evaluate and analyze the basic concepts of classical and molecular genetics	K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	1	3	3	1	2	1
CO2	3	3	2	1	1	3	3	2	2	1
CO3	3	3	3	2	1	3	3	2	2	1
CO4	3	3	3	2	1	3	3	2	3	1
CO5	3	3	2	2	1	3	3	2	2	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) correlation,
 “3” – Substantial (High) Correlation, “-” indicates there is no correlation.

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Historical developments of molecular biology and Genetics; DNA and RNA as genetic material - Griffith's, Hershey - chase Experiments and Fraenkel-Conrat Experiment; Structure and functions of Nucleic acids: Nucleosides and Nucleotides, Purines and Pyrimidines. Watson and Crick model of DNA. A, B & Z forms of DNA. Structure of RNA and its Types.	13	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
II	Early concepts of inheritance; Discussion on Mendel's Laws of inheritance - Law of Dominance and Uniformity – Incomplete dominance and codominance; Law of Segregation of genes - Morgan's work on <i>Drosophila</i> ; Law of Independent Assortment – Dihybrid. Test cross and Back Cross.	14	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
III	Sex determination, differentiation and sex-linkage, Sex – linked inheritance, Sex-influenced and sex-limited traits; Linkage Analysis – Fruit Fly. Recombination and genetic mapping in eukaryotes, Multiple Alleles – ABO Blood Grouping. Somatic cell genetics.	14	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
IV	Chromosome structural organization – Chromatin and chromatids; Special types of Chromosomes: Polytene and Lampbrush chromosomes. DNA Replication- Prokaryotic and Eukaryotic DNA replication, enzymes and proteins involved in DNA replication. Models of replication – Semi-conservative, Unidirectional, Bidirectional, Rolling circle mechanism. Inhibitors of DNA replication. DNA repair mechanisms.	16	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
V	Transcription – Prokaryotic and Eukaryotic transcription, Enzymes involved in transcription. Post transcriptional modifications – 5' – CAP formation, 3' processing and polyadenylation, splicing. Regulation of Transcription - Prokaryotes: lac operon and trp operon. Translation – Prokaryotic and Eukaryotic translation, Mechanisms of initiation, elongation and termination. Post-translational modifications - Importance of Glycosylation and Phosphorylation.	18	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5
VI	Self-Study for Enrichment (Not Included for End Semester Examination) Extra Nuclear inheritance, Crossing over, Replisomes and Primosomes, Wobble hypothesis, hormonal control of gene expression, Regulation of transcription.	-	CO1, CO2, CO3, CO4, CO5	KI, K2, K3, K4, K5

Text Books

1. Verma, P.S & Agarwal, V.K. (2022). *Cell Biology, Genetics, Molecular Biology, Evolution and Ecology*. S Chand and Company Ltd.
2. Vishnu Shankar, S. (2021). *Fundamentals of Genetics and Molecular Biology*. Red'shine Publication Pvt. Ltd.
3. Pragya, K. (2020). *Essentials of Genetics*. Dream tech Press.
4. Veer Bala, R. (2019). *Genetics*, 4th edition. Med tech.
5. Andreas, H & Samuel, C. (2018). *Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology 8th Edition*. Cambridge University Press.

Reference Books

1. Poonam, A. (2022). *Lippincott Illustrated Reviews: Cell and Molecular Biology*. Wolters Kluwer India Pvt Ltd.
2. Harvey, L., Arnold B., Chris, A. K & Monty, K. (2021). *Molecular Cell Biology Ninth edition*. W. H. Freeman
3. Nancy, L.C., Rachel, R.G., Carol, C.G., Gisela, G.S & Cynthia, W. (2020). *Molecular Biology: Principles of Genome Function 3rd Edition*. Oxford University Press.
4. Lieberman. (2020). *BRS Biochemistry, Molecular Biology, and Genetics*. 7th edition. Wolters Kluwer India Pvt Ltd.
5. Jocelyn, E.K., Elliott, S.G & Stephen, T.K. (2017). *Lewin's GENES XII 12th edition*. Jones and Bartlett Publishers, Inc

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1. <https://www.pdfdrive.com/lewins-genes-xii-e185848559.html>
2. <https://www.pdfdrive.com/introduction-to-genetics-a-molecular-approach-e187102063.html>
3. <https://www.pdfdrive.com/the-cell-a-molecular-approach-e186369576.html>
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5. <https://www.pdfdrive.com/cell-biology-genetics-molecular-biology-evolution-and-ecology-e157248372.html>

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1. <https://microbenotes.com/category/molecular-biology/>
2. <https://www.easybiologyclass.com/topic-genetics/>
3. <https://ocw.mit.edu/courses/7-03-genetics-fall-2004/pages/lecture-notes/>
4. <http://ndl.iitkgp.ac.in/document/bnZnR2hPaUVqRU9TbFc2Rmp1MVJzN0dyTCs3OGxyRzdaUWpPTzdRV2pBTT0>
5. <http://ndl.iitkgp.ac.in/document/Qkh4R2FGUkRNZjFicFUvWmpzQ2loU1NPaeI6eWpVaXpnNGUwc21iQzZKbUdaczdobHlyeWNpditXM2hpaFNOS1F6dVc4NGltYWZEQ09YbEVIWjJtelE9PQ>

Pedagogy

Blackboard, PPT, Videos, Animations, Group Discussion and Quiz.

Course Designers

1. **Ms. P. ILAMATHY**
2. **Dr. M. KEERTHIGA**

Semester–II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT2CC2P	MOLECULAR BIOLOGY & GENETICS (P)	CORE	3	3

Course Objectives

- To develop skills related to DNA Isolation Techniques.
- To study about the Quantification of Nucleic acids.
- To gain knowledge in mutagenesis.
- To perform experiments on *Drosophila* and observe their genetic variations.
- To gain knowledge about simple traits in man.

Course Outcome and Cognitive Level Mapping

Upon the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Demonstrate and analyze the DNA isolation methods.	K3, K4
CO2	Infer the separation techniques for DNA and protein and their quantification methods.	K4
CO3	Illustrate and interpret the different mutagenesis techniques.	K3
CO4	Explain the Mendelian traits and distinguish the male and female <i>Drosophila</i> cultures.	K4
CO5	Categorize the different genetic disorders in man using the Pedigree Chart.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	2	3	3	1
CO2	3	3	3	3	2	3	2	3	3	1
CO3	3	2	3	3	2	3	2	3	3	1
CO4	3	2	3	3	1	3	2	2	3	1
CO5	3	3	3	3	1	3	2	2	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) Correlation, “-” indicates there is no Correlation.

Syllabus

1. Isolation and purification of Genomic DNA from Prokaryotes
2. Isolation and purification of Genomic DNA from Eukaryotes
3. Isolation and purification of Plasmid DNA
4. Separation of DNA by using AGE
5. Separation of Protein by using NATIVE - PAGE
6. Separation of Protein by using SDS - PAGE
7. Quantification of Nucleic Acids – DNA by chemical method
8. Quantification of Nucleic Acids – RNA by chemical method
9. Bacterial mutagenesis using Physical Method
10. Transformation
11. Observation of simple Mendelian traits among humans.
12. Drosophila – male and female Identification and Culture.
13. Karyotyping with the help of photographs
14. Pedigree charts of some common characters like blood group and color blindness.
15. Determination the ABO blood groups in a random sample and calculation of the allele frequency using Hardy Weinberg's law.

Reference Books

1. Taneri, B., Asilmaz, E., Delikurt, T., Savas, P., Targen, S., & Esemen, Y. (2020). *Human Genetics and Genomics: A Practical Guide*, John Wiley & Sons.
2. Hofmann, A.C., Willson, S & Walker's. (2017). *Principles and Techniques of Biochemistry and Molecular Biology*, Cambridge University Press.
3. Joshi, S., & Dhamij, N., (2015). *Rediscovering Genetics: A Laboratory Manual*, Wiley India.
4. Malacinski, G.M., & Freifeder's. (2013). *Essentials of Molecular Biology*, Norosa Publishing House.
5. Thompson, D. (2011). *Cell and Molecular Biology Lab Manual*, Norosa Publishing House.

E-Books

1. <https://jru.edu.in/studentcorner/lab-manual/agriculture/Fundamentals%20of%20Genetics.pdf>
2. https://academicworks.cuny.edu/cgi/viewcontent.cgi?article=1008&context=ny_oers
3. <https://sjce.ac.in/wp-content/uploads/2018/04/Cell-Biology-Genetics-Laboratory-Manual-17-18.pdf>

4. https://www.academia.edu/27721547/LABORATORY_MANUAL_BTY108_BASIC_GENETICS_LABORATORY
5. <https://www2.umbc.edu/summerstem/documents/biology/BIOL302L-SU14-Caruso.pdf>

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1. <https://www.jove.com/v/5058/separating-protein-with-sds-page>
2. http://www.uwyo.edu/molb2021/virtual-edge/lab13/exp_13a.html
3. <https://www.youtube.com/watch?v=oBwtxdI1zvK>
4. <https://www.jove.com/v/5082/an-introduction-to-drosophila-melanogaster>

Pedagogy

Practical Observation and Demo

Course Designers

1. **Ms. R. NEVETHA**
2. **Dr. G. GOMATHI**

Semester – II	Internal Marks: 25		External Marks: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
22UBT2CC3	BIOINSTRUMENTATION	CORE	3	3

Course Objectives

- To understand the working principles of different instruments used in the biological field
- To provide a better understanding of various analytical techniques
- To apply the instruments in different fields.

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Define and Express the principle of Microscopy, Electrophoresis, Chromatography, Colorimeter and tracing techniques	K1, K2
CO2	Demonstrate and develop the working mechanism of various analytical techniques	K2, K3
CO3	List the types and applications of microscopy, Electrophoresis, Chromatography, Colorimeter and Centrifugation techniques	K4
CO4	Appraise the advantages of advanced techniques like HR_TEM, 2D-GEL, LC-MS, FTIR and NMR	K5
CO5	Elaborate the role of Bioinstrumentation techniques in Biomedical applications.	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	2	2	1	3	1	1	3	1
CO2	3	2	2	2	1	3	1	1	2	1
CO3	3	3	2	2	1	3	3	2	2	1
CO4	3	3	2	2	1	3	3	2	3	1
CO5	3	3	3	3	1	3	3	3	3	2

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation, “3” – Substantial (High) Correlation, “-” indicates there is no correlation.

Unit	Content	Hours	COs	Cognitive Level
I	Microscope – Light Microscopy, Bright and Dark field Microscopy, Fluorescence Microscopy, Confocal Microscope, Electron microscopy: HR-TEM, FE- SEM.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	Principle and Applications of Electrophoresis – Types of electrophoresis- Pulsed Field Gel Electrophoresis, SDS-PAGE and 2 D gel; Immunoelectrophoresis; Blotting Techniques; Gel documentation.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	Fundamentals of Chromatography - Principle and its applications, Types –TLC, Column, Affinity, Ion –exchange, HPLC, GC-MS and LC-MS.	7	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	Colorimeter – Principle and its applications, Beer Lambert’s Law, Spectrophotometer- Principle and its applications, Types of Spectrophotometer-UV – Visible	7	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	Centrifugation – Principle, Types – Zonal, Differential, Density gradient centrifugation and ultracentrifugation its applications. Imaging Techniques- X-ray and NMR. Tracer Techniques - Radioactive isotope – Half life, GM Counter, Liquid Scintillation Counter.	11	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	Self-Study for Enrichment (Not Included for End Semester Examination) Introduction to Instrumentation, AGE, FTIR, Centrifugation. Autoradiography	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

Text Books

1. Reilly (2019). *Bioinstrumentation*. CDS Publishers
2. Bhawana Pandey M.H. Fulekar. (2019). *Bioinstrumentation*. Dream tech Publishers.
3. Ankita, J., Haresh K., Varsha, T & Nikunj, B. P. (2020) *Bioinstrumentation techniques - Basics and applications*. Notion Press
4. Agarwal, P.K., Baqri, S.R & Gau, K. (2022). *Molecular Biology, Bioinstrumentation and Biotechniques*. Pragati Prakashan Publishers.
5. Veerakumari, L. (2021). *Bioinstrumentation*. MJP Publisher

Reference Books

1. Andreas, H & Clokie, S .(2018).*Wilson and Walker's Principles and Techniques of Biochemistry and Molecular Biology*. Cambridge University Press.
2. Mesut, S. (2020). *Instrumentation Handbook for Biomedical Engineers*. CRC Press
3. Vasudevan, R. (2019). *Biomolecular and Bioanalytical Techniques, Theory, Methodology and Applications*. Wiley
4. Bogusław, B & Irena B.(2022). *Handbook of Bioanalytics*. Springer International Publishing.
5. Jeanette, M.V.E. (2019). *Immunoassay and Other Bioanalytical Techniques*. Taylor & Francis Limited.

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1. <https://www.technologynetworks.com/analysis/articles/an-introduction-to-the-light-microscope-light-microscopy-techniques-and-applications-351924>
2. <https://www.nature.com/scitable/definition/gel-electrophoresis-286/>
3. <https://www.khanacademy.org/science/class-11-chemistry-india/xfbb6cb8fc2bd00c8:in-in-organic-chemistry-some-basic-principles-and-techniques/xfbb6cb8fc2bd00c8:in-in-methods-of-purification-of-organic-compounds/a/principles-of-chromatography>
4. <https://study.com/academy/lesson/what-is-centrifugation-definition-process-uses.html>
5. <https://microbenotes.com/electron-microscope-principle-types-components-applications-advantages-limitations/>

E - Books

1. <https://www.pdfdrive.com/bioinstrumentation-tools-for-understanding-life-e14086185.html>
2. https://sist.sathyabama.ac.in/sist_coursematerial/uploads/SMB2103.pdf
3. <https://www.kau.edu.sa/Files/0017514/Subjects/principals%20and%20techniques%20of%20biochemistry%20and%20molecular%20biology%207th%20ed%20wilson%20walker.pdf>
4. <https://www.pdfdrive.com/bioanalytical-chemistry-e180345635.html>
5. <https://www.pdfdrive.com/bioanalytical-chemistry-e185517690.html>

Pedagogy

Chalk and Talk, PPT, Videos and Animations

Course Designers

1. **DR. R. UMA MAHESHWARI**
2. **DR. S. ABINAYA**

Semester – II	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/ WEEK	CREDITS
22UBT2AC3P	MICROBIOLOGY AND BIOCHEMISTRY (P)	ALLIED	4	3

Course Objectives

- To impart the students with hands on skills related to biochemical techniques.
- To enable the students to perform qualitative analysis of biomolecules.
- To make the students to maintain aseptic and pure culture techniques of microorganisms.
- To enhance the students with knowledge about biochemical characterization of microorganisms.

Course Outcome and Cognitive Level Mapping

Upon successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Define and Demonstrate aseptic and pure culture techniques in isolation and culture of microorganisms	K1, K2
CO 2	Identify and Classify the type of microorganism using staining techniques & biochemical tests.	K2, K3
CO 3	Make use of various tests for examination of urine & enzymes.	K3
CO 4	Apply various qualitative tests to identify the biomolecules.	K3
CO 5	Identify and Examine the biomolecules present in the given sample.	K3, K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	2	3	1	1	3	1
CO2	3	2	3	3	2	3	1	1	3	1
CO3	3	2	3	3	2	3	2	2	3	1
CO4	3	2	2	3	2	3	2	2	3	1
CO5	3	2	2	3	2	3	2	3	3	1

“1” – Slight (Low) Correlation, “2” – Moderate (Medium) Correlation,
“3” – Substantial (High) Correlation, “-” indicates there is no correlation.

Syllabus

1. Preparation of Molarity, Normality solutions and Buffers.
2. Qualitative analysis of Carbohydrates
3. Qualitative analysis of proteins
4. Qualitative analysis of Lipids.
5. Estimation of Glucose by DNS method.
6. Qualitative chemical examination of Urine.
7. Determination of salivary amylase activity.
8. Separation of plant pigments using Paper chromatography.
9. Media Preparation & Sterilization.
10. Isolation and Enumeration of Microorganisms from Water and Soil.
11. Pure Culture Techniques – Spread plate, Streak plate, Pour plate and Slant preparation.
12. Measurement of Bacterial Growth – Turbidometric method
13. Staining Techniques – Simple staining, Gram's staining & Capsule Staining.
14. Cell Motility – Hanging drop technique.
15. Biochemical Characterization of microorganisms – IMViC tests.

Reference Books

1. Arora, B., & Arora, D. R. (2020). *Practical Microbiology (2nd Edition)*. CBS Publishers & Distributors.
2. Chawla, R. (2020). *Practical Clinical Biochemistry: Methods and Interpretations*. JP Medical Ltd.
3. Aneja, K.R. (2018). *Laboratory Manual of Microbiology and Biotechnology (2nd Edition)*. ED-TECH.
4. Gupta, R.C., Bhargava, S. (2018). *Practical Biochemistry (5th Edition)*. CBS Publishers.
5. Cappucino, J. G. (2017). *Microbiology - Laboratory Manual*. Pearson.
6. Plummer, D. T. (2017). *An Introduction to Practical Biochemistry (3rd Edition)*. Tata McGraw-Hill Education.

E- Books

1. <https://www.pdfdrive.com/bensons-microbiological-applications-laboratory-manual-in-general-microbiology-short-version-d185416575.html>

2. <https://www.pdfdrive.com/laboratory-manual-for-general-microbiology-e33507828.html>
3. <https://www.pdfdrive.com/microbiology-laboratory-exercises-justmedeu-d15396585.html>
4. <https://www.pdfdrive.com/laboratory-manual-of-biochemistry-d44169898.html>
5. <https://www.pdfdrive.com/biochemistry-laboratory-manual-e33724502.html>

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1. <https://vlab.amrita.edu/?sub=3&brch=63>
2. <https://vlab.amrita.edu/?sub=3&brch=73>
3. https://profiles.uonbi.ac.ke/jamesmuthomi/files/acp101_microbiology_practical_exercises.pdf
4. <https://nptel.ac.in/courses/102103015>
5. <https://jru.edu.in/studentcorner/lab-manual/bpharm/Lab%20Manual%20-%20Biochemistry.pdf>

Pedagogy

Practical Observation and Demo

Course Designers

1. **DR. R. RAMESHWARI**
2. **MS. P. JENIFER**

Semester: II	Internal Marks: 100			
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UGEVS	ENVIRONMENTAL STUDIES	ABILITY ENHANCEMENT COMPULSORY COURSE	2	2

Course Objective

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome and Cognitive Level Mapping

On the successful completion of the course, students will be able to

CO Number	CO Statement	Cognitive Level
CO1	Outline the nature and scope of environmental studies	K1, K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classify various types of ecosystem with its structure and function.	K2, K3
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment and explain protection acts	K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	2	3	3	2	2	3	2	3
CO2	3	3	2	3	3	3	2	3	3	3
CO3	2	3	3	2	3	3	3	3	3	2
CO4	2	3	3	3	2	3	2	3	3	3
CO5	3	3	2	3	3	3	3	2	3	3

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-“ indicates there is no correlation

Syllabus

UNIT	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	Introduction to environmental studies Definition, scope and importance. Need for public awareness	06	CO1, CO2, CO3, CO4	K1, K2, K3,
II	<p>Natural Resources: Renewable and non-renewable resources:</p> <p>a. Forest resources: use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.</p> <p>b. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.</p> <p>c. Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.</p> <p>d. Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.</p> <p>e. Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. Case studies.</p> <p>f. Land resources: Land as resources, land degradation, man induced Landslides, soil erosion and desertification.</p> <p>g. Role of an individual in conservation of natural resources.</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3
III	<p>Ecosystems</p> <p>Concept, Structure and function of an ecosystem. Producers, consumers and decomposers</p> <p>Energy flow in the ecosystem and Ecological succession.</p> <p>Food chains, food webs and ecological pyramids</p> <p>Introduction, types, characteristic features, structure and function of the following ecosystem:-Forest ecosystem, Grassland ecosystem and Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)</p>	06	CO1, CO2, CO3, CO4	K1, K2, K3
IV	<p>Biodiversity and Environmental Pollution</p> <p>Introduction, types and value of biodiversity. India as a mega diversity nation. Hot-spots of biodiversity. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Definition, Causes, effects and control measures of:</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise pollution e. Nuclear hazards</p> <p>Solid waste Management: Causes, effects and control measures of urban and industrial wastes. E-Waste Management: Sources and Types of E-waste. Effect of E-waste on environment and human body. Disposal of E-waste, Advantages of Recycling E-waste. Role of an individual in prevention of pollution. Disaster management: floods, earthquake, cyclone and landslides.</p>			
V	<p>Social Issues and the Environment Water conservation, rain water harvesting, watershed management. Climate change, global warming, acid rain, ozone layer depletion, Wasteland reclamation. Environment Protection Act Wildlife Protection Act. Forest Conservation Act. Population explosion – Family Welfare Programmes Human Rights - Value Education. HIV/ AIDS - Women and Child Welfare. Role of Information Technology in Environment and human health.</p>	06	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>Self-Study for Enrichment (Not to be included for End Semester Examination) Global warming – climate change – importance of ozone – Effects of ozone depletion. Biogeography – history, ecology and conservation. International laws and policy</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

References

1. Beard, J.M. 2013. Environmental Chemistry in Society (2nd edition). CRC Press.
2. Girard, J. 2013. Principles of Environmental Chemistry (3rd edition). Jones & Bartlett.
3. Brebbia, C.A. 2013. Water Resources Management VII. WIT Press.
4. Pandit, M.K. & Kumar, V. 2013. Land use and conservation challenges in Himalaya: Past, present and future. In: Sodhi, N.S., Gibson, L. & Raven, P.H. Conservation Biology: Voices from the Tropics. pp. 123-133. Wiley-Blackwell, Oxford, UK (file:///Users/mkpandit/ Downloads /Raven%20et%20al.%202013.%20CB%20Voices%20from%20Tropics%20(2).pdf).
5. Hites, R.A. 2012. Elements of Environmental Chemistry (2nd edition). Wiley & Sons.
6. Harnung, S.E. & Johnson, M.S. 2012. Chemistry and the Environment. Cambridge University Press.
7. Boeker, E. & Grondelle, R. 2011. Environmental Physics: Sustainable Energy and Climate Change. Wiley.
8. Forinash, K. 2010. Foundation of Environmental Physics. Island Press.
9. Evans, G.G. & Furlong, J. 2010. Environmental Biotechnology: Theory and Application (2nd edition). Wiley-Blackwell Publications.
10. Williams, D. M., Ebach, M.C. 2008. Foundations of Systematics and Biogeography. Springer
11. Pani, B. 2007. Textbook of Environmental Chemistry. IK international Publishing House.
12. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar

Course Designer

Dr.B.Thamilmaraiselvi

Ability Enhancement Compulsory Course II (AECC) : Environmental Studies (22UGEVS)

Assessment Rubrics for 100 Marks

1. Documentary (or) Poster Presentation (or) Elocution-25 Marks
2. Quiz (or) MCQ Test-25 Marks
3. Album Making (or) Case study on a topic (or) Field Visit -25 Marks
4. Essay Writing (or) Assignment (Minimum 10 pages) -25 Marks

There will be no End Semester Examination for this course. However, the subject teacher will evaluate the above mentioned components based on the performance of the students and submit the marks out of 100 (in the format to be supplied by the COE) with the approval of the concerned Head of the Department to the COE along with CIA marks of other courses.

INNOVATION & ENTREPRENEURSHIP

Semester: II	Internal marks:40		External marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs / week	CREDITS
22UGIE	INNOVATION & ENTREPRENEURSHIP	Ability Enhancement Compulsory Course -III	2	1

Course Objective

- The course is designed to motivate the students in Entrepreneurship with innovative ideas and build interest in Venture Creation.

Course Outcome and Cognitive Level Mapping

The students will be able to

CO	CO Statement	Knowledge Level
CO 1	Identify Self-Entrepreneurial traits and passion leads.	K3
CO 2	Discover problem solving opportunities and generate ideas	K3
CO 3	Analyse the process of design thinking	K4
CO 4	Develop Business Model canvas for the idea generated	K5
CO 5	Validate the business idea by creating Capstone project	K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1										
CO2										
CO3										
CO4										
CO5										

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	CO'S	COGNITIVE LEVELS
I	<p><u>Entrepreneurship & Intrapreneurship</u></p> <p>Importance of Entrepreneurship Development-The entrepreneurial mind set – Attributes and Characteristics of a successful entrepreneur.</p> <p>Intrapreneurship- Importance- Attributes, Contribution and Characteristics of a successful Intrapreneur- Types of Intrapreneurs.</p> <p>Self-Discovery- Learnings from famous company cases that promote entrepreneurship and Intrapreneurship. (Activity)</p>	6	<p>CO1</p> <p>CO2</p> <p>CO3</p> <p>CO4</p> <p>CO5</p>	<p>K3</p> <p>K4</p> <p>K5</p>
II	<p><u>Entrepreneurial Skill Sets</u></p> <p>Significance of Entrepreneurship skills-Business Management Skill- Decision making skills- Principles of Effectuation- Analytical & Problem-solving skill- Critical thinking skill- Lateral thinking skill- Factors associated with lateral thinking along with examples.</p> <p>Opportunity Discovery- Identify problems worth solving through JTBD method (Activity)</p>	6	<p>CO1</p> <p>CO2</p> <p>CO3</p> <p>CO4</p> <p>CO5</p>	<p>K3</p> <p>K4</p> <p>K5</p>

III	Design Thinking & Innovation Innovation & Creativity- Role in Industry and Organizations- Dynamics of Creative Thinking-Process of Design Thinking- Implementing the Process in Driving Innovation through scientific technologies and Non technology process. Business Idea Generation – Build your own Idea Bank with Innovative Approaches (Activity)	6	CO1 CO2 CO3 CO4 CO5	K3 K4 K5
IV	Crystallising the business Idea Customer Discovery- Identification of customer segments-Drafting of Value Proposition Canvas with a venture creation Idea. Basics of Business Model and LEAN Approach, Blue Ocean Strategy Approach. Crafting business model for a venture using the Lean Canvas – (Activity)	6	CO1 CO2 CO3 CO4 CO5	K3 K4 K5
V	Start-up Business Plan Presentation of Capstone project; Validation Analysis; Pre-incubation and Incubation stages to develop a start-up ecosystem.	6	CO1 CO2 CO3 CO4 CO5	K3 K4 K5 K6
VI	Self study for enrichment: (Not to be included for External examination) Case study analysis on Entrepreneurship		CO1 CO2 CO3 CO4 CO5	K3 K4 K5

Textbooks:

1. Elias G.Carayannis, Elbida.D.Samra (2015), Innovation and Entrepreneurship,
2. Peter.F. Drucker (2006), Innovation and Entrepreneurship, Harper Publications

Reference books:

1. John R.Bessant, Joe Tidd (2015), Innovation and Entrepreneurship, Wiley Publictaions
2. Mike Kennard (2021), Innovation and Entrepreneurship, Routledge, Taylor and Frnacis

Web References:

1. <https://innovation-entrepreneurship.springeropen.com/>
2. <https://www.worldcat.org/title/innovation-and-entrepreneurship-practice-and-principles/oclc/11549089/lists>

Pedagogy:

e- Content modules, Activity worksheet, Case Studies

Course Designer:

Dr.R.Subha, Assistant Professor, Innovation ambassador, Department of Chemistry

Dr.S.Sowmya,Assistant Professor, Innovation ambassador, Department of Commerce

**ABILITY ENHANCEMENT COMPULSORY COURSE III-
INNOVATION AND ENTREPRENEURSHIP**

Assessment Rubrics for 100marks

S.No	Particulars	Marks
1	Self Analysis / Preparation of Self Identification Report / Case study presentation	20
2	Identification of Problem / Innovative practice/ Business plan report	20
3	Lean Canvas / Value Proposition Model / Prototype	20
4	VIVA VOCE	
	a. Novelty of Business Idea	20
	b. Commercial Scalability	10
	c. Pitching Presentation	10
	TOTAL	100

There will be no End Semester Examination for this Course. The subject teacher will make the assessment of students performance based on the above mentioned components and an internal VIVA VOCE will be conducted by the Institution Innovation Ambassadors of Institution Innovation Council, Ministry of Education. Marks will be awarded and submitted to CoE in the Prescribed format specified by the Controller of the examination approved by the Head of respective Departments.

CAUVERY COLLEGE FOR WOMEN

(AUTONOMOUS)



DEPARTMENT OF BIOTECHNOLOGY

UG SYLLABUS

(For the candidates admitted from the academic year 2021 -22 onwards)

B.Sc., BIOTECHNOLOGY
PROGRAMME EDUCATIONAL
OBJECTIVES

THE PROGRAMME AIMS

1. To make our student competent in various areas of biotechnology.
2. To inculcate the capability to work as entrepreneurs with strong ethics and communication skills.
3. To equip the students to pursue higher education and research in reputed institutes at national and international levels.
4. To develop a working knowledge of biotechnological product and processes.

PROGRAMME OUTCOMES

1. Apply ethical principles and commit to professional ethics and responsibilities in technology usages.
2. Function effectively as an individual and as a member in multidisciplinary settings.
3. Demonstrate knowledge in various environment with respect to sustainable development.
4. Recognize the need for and have the preparation & ability to engage independent and lifelong learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES

1. Acquire knowledge on the fundamentals of biotechnology for sound and solid base which enables them to understand the emerging and advance concepts in life sciences.
2. Acquire knowledge in domain of biotechnology enabling their applications in industry and research.
3. Empower the students to acquire technological knowhow by connecting disciplinary and interdisciplinary aspects of biotechnology.
4. Recognize the importance of biotechnological applications as to usher next generation entrepreneurship



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF BIOTECHNOLOGY
B.Sc., BIOTECHNOLOGY PROGRAMME STRUCTURE
(For the candidates admitted from the academic year 2021 -2022 onwards)

Semester	Part	Course	Title	Subject Code	Inst. Hour / Week	Credit	Exam Hours	Marks		Total		
								Int	Ext			
I	I	Language Course-I (LC) –Tamil/Other Languages	இக்கால இலக்கியம்	19ULT1	6	3	3	25	75	100		
			Story, Novel, Hindi, Literature & Grammar – I	19ULH1								
			History of Popular Tales, Literature and Sanskrit Story	19ULS1								
			Communication in French – I	19ULF1								
	II	English Language Course – I (ELC)	Functional Grammar for Effective Communication – I	19UE1	6	3	3	25	75	100		
	III	Core Course-I (CC)	Cell Biology	19UBT1CC1	6	4	3	25	75	100		
				Core Practical – I (CP)	Lab in Cell Biology	19UBT1CC1P	3	3	3	40	60	100
				First Allied Course– I (AC)	General Microbiology	19UBT1AC1	4	4	3	25	75	100
				First Allied Course– II (AP)	Lab in Microbiology	19UBT1AC1P	3	-	-	-	-	-
	IV	The Universal Human Values	The Universal Human Values	20UGVE	2	2	3	25	75	100		
Total					30	19				600		
II	I	Language Course– II (LC)–Tamil /Other Languages	இடைக்கால இலக்கியமும் புதினமும்	19ULT2	6	3	3	25	75	100		
			Prose, Drama, Hindi Literature – 2 & Grammar – II	19ULH2								
			Poetry, Textual Grammar and Alakara	19ULS2								
			Communication in French – II	19ULF2								
	II	English Language Course–II (ELC)	Functional Grammar for Effective Communication – II	19UE2	6	3	3	25	75	100		
	III	Core Course–II (CC)	Molecular Biology	19UBT2CC2	6	4	3	25	75	100		
				Core Practical – II (CP)	Lab in Molecular Biology	19UBT2CC2P	3	3	3	40	60	100
				First Allied Course– II (AP)	Lab in Microbiology	19UBT1AC1P	4	2	3	40	60	100
				First Allied Course– III(AC)	Bioinstrumentation	19UBT2AC2	3	3	3	25	75	100
	IV	Part –IV	Environmental Studies	21UGES	2	2	3	25	75	100		
V	Extra Credit Course	Swayam Online Course	To be fixed later	-	-	As per UGC Recommendation						
Total					30	20				700		

III	I	Language Course – III (LC)–Tamil/Other Languages	காப்பியமும் நாடகமும்	19ULT3	6	3	3	25	75	100	
			Medieval, Modern Poetry & History of Hindi Literature – 3	19ULH3							
			Prose, Textual Grammar and Vakyarachana	19ULS3							
			Communication in French – III	19ULF3							
	II	English Language Course-III(ELC)	Reading and Writing for Effective Communication – I	19UE3	6	3	3	25	75	100	
	III	Core Course – III (CC)	rDNA Technology	19UBT3CC3	6	4	3	25	75	100	
			Core Practical – III (CP)	Lab in rDNA Technology	19UBT3CC3P	3	3	3	40	60	100
			Second Allied Course – I (AC)	Biomolecules & Basics of Nanotechnology	21UBT3AC3	4	4	3	25	75	100
			Second Allied Course-II (AP)	Lab in Biomolecules & Nanotechnology	21UBT3AC2P	3	-	-	-	-	-
	IV	Non Major Elective I-for those who studied Tamil under Part-I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but optfor other languages in degree programme	Basics of Biotechnology	19UBT3NME1	2	2	3	25	75	100	
			Basic Tamil	19ULC3BT1							
			Special Tamil	19ULC3ST1							
	V	Extra Credit Course	Swayam Online Course	To be fixed later	-	-	As per UGC Recommendation				
	Total				30	19				600	
IV	I	Language Course –IV (LC) -Tamil/Other Languages	பண்டலய இலக்கியம்	19ULT4	6	3	3	25	75	100	
			Letter writing, General essays, Technical Terms, Proverbs, Idioms& Phrases, Hindi Literature – 4	19ULH4							
			Drama, History of Drama Literature	19ULS4							
			Communication in French – IV	19ULF4							
	II	English Language Course – IV(ELC)	Reading and Writing for Effective Communication – II	19UE4	6	3	3	25	75	100	
	III	Core Course – IV (CC)	Immunology	19UBT4CC4	5	4	3	25	75	100	
			Core Practical – IV (CP)	Lab in Immunology	19UBT4CC4P	3	3	3	40	60	100
			Second Allied Course - II (AP)	Lab in Biomolecules & Nanotechnology	21UBT3AC2P	3	2	3	40	60	100
			Second Allied Course – III(AC)	Plant Anatomy and Physiology	19UBT4AC4	3	3	3	25	75	100

	IV	Non Major Elective II- for those who studied Tamil under Part-I a) Basic Tamil for other language students b) Special Tamil for those who studied Tamil upto +2 but opt for other languages in degree programme	Applied Biotechnology Basic Tamil Special Tamil	19UBT4NME2 19ULC4BT2 19ULC4ST2	2	2	3	25	75	100
		Skill Based Elective - I	A) Information in Omics and Applications	19UBT4SBE1A	2	2	3	25	75	100
	B) Bioinformatics		19UBT4SBE1B							
V	Extra Credit Course	Swayam Online Course	To be fixed later	-	-	As per UGC recommendations				
Total					30	22				800
15 Days INTERNSHIP during Semester Holidays*										
V	III	Core Course – V (CC)	Plant Biotechnology	19UBT5CC5	5	5	3	25	75	100
		Core Course – VI (CC)	Animal Biotechnology	19UBT5CC6	5	5	3	25	75	100
		Core Course – VII (CC)	Biostatistics	19UBT5CC7	5	5	3	25	75	100
		Core Practical – V (CP)	Lab in Plant and Animal Biotechnology	19UBT5CC5P	4	4	3	40	60	100
		Major Based Elective – I	A) Pharmacognosy	19UBT5MBE1A	5	5	3	25	75	100
	B) Cancer Biology		19UBT5MBE1B							
	IV	Skill Based Elective – II	A) Molecular Diagnostics and Therapeutics	19UBT5SBE2A	2	2	3	25	75	100
			B) Lab in Bioinformatics	19UBT5SBE2BP				40	60	
		Skill Based Elective – III	A)DNA Fingerprinting	19UBT5SBE3A	2	2	3	25	75	100
			B) Lab in Plant Tissue Culture & Environmental Biotechnology	21UBT5SBE3BP				40	60	
	UGC Jeevan Kaushal Life Skills	Professional Skills	19UGPS	2	2	3	25	75	100	
	V	Extra Credit Course	Swayam Online Course	To be Fixed Later	-	-	As per UGC Recommendation			
	Total					30	30			
VI	III	Core Course – VIII (CC)	Microbial Biotechnology	19UBT6CC8	6	6	3	25	75	100
		Core Course – IX (CC)	IPR, Bioethics and Biosafety	19UBT6CC9	6	6	3	25	75	100
		Core Practical – VI (CP)	Lab in Microbial Biotechnology	19UBT6CC6P	5	4	3	40	60	100
		Major Based Elective – II	A) Environmental Biotechnology	19UBT6MBE2A	6	6	3	25	75	100
			B) Stem Cell Biology	19UBT6MBE2B						

	Major Based Elective – III	A) Bioentrepreneurship	19UBT6MBE3A	6	6	3	25	75	100
		B) Drug Discovery and Development	19UBT6MBE3B						
V	Extension Activities	Extension Activities	19UGEA	-	1	-	-	-	-
	Gender Studies	Gender Studies	19UGGS	1	1	3	25	75	100
Total				30	30				600
Grand Total				180	140				4100

***Internship – 2 Credits (Extra Credit Course)**

Evaluation Based on the following component

Internship Component

Component	Marks
Attendance	10
Performance	30
Presentation	20
Report	20
Review	20
Total	100

CORE COURSE – I
CELL BIOLOGY

Semester – I	CELL BIOLOGY	Hours/Week - 6	
Core Course – I		Credits - 4	
Course Code - 19UBT1CC1		Internal 25	External 75

Preamble

- To study about cell, its types, cellular organelles and their functions.
- To study about cell cycle and its regulations.
- To study about cell signaling pathways

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Exhibit a knowledge base in classes of cells, types of cell division.	K1
CO 2	Outline a clear and concise idea about cell membrane and cytoskeleton	K2
CO 3	Discuss the properties and functions of the cytoplasmic organelles.	K2
CO 4	Illustrate the reactions that comprise energy metabolism.	K2
CO 5	Explain about cell cycle and its regulations.	K2

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	S	M
CO2	M	M	S	M
CO3	S	M	M	M
CO4	S	S	S	S
CO5	M	M	S	S

S-Strong, M-Medium, L-Low

CORE COURSE – I
CELL BIOLOGY

Unit I - Fundamentals of cell structure **18 Hours**

Discovery of Cells - Basic properties of cells, cell size and shape, cell theory, cell morphology, Different classes of cells – Prokaryotic and Eukaryotic cells. Cell cycle, cell division – Mitosis and Meiosis.

Unit II - Cellular membranes and matrices **18 Hours**

Cell Membrane – Plasma Membrane - Chemical composition and fluidity of membranes; transport of nutrients, ions and macromolecules across the membranes; structural organization of cell wall ; Extracellular matrices – structure and function; Cytoskeleton and cell motility: Microtubules, Microfilaments and Intermediate filaments.

Unit III - Endomembrane System **18 Hours**

Structure and functions of Nucleus - Endoplasmic Reticulum – Smooth and Rough; Functions of Endoplasmic Reticulum; Golgi Complex – Structure and functions; Ribosomes- Types, structure and functions; Types of Microbodies; Peroxisomes; Glyoxysomes; Lysosomes - Types, structure and functions.

Unit IV- Cellular Organelles in Energy Metabolism **18 Hours**

Mitochondria – Morphology; Chemical Composition; Enzyme System of Mitochondria; functions- Oxidation of Carbohydrates. Chloroplast – Morphology; Chemical Composition; functions- Photosynthesis and Protein Synthesis.

Unit V- Applications of Cell Biology **18 Hours**

Apoptosis analysis, Cytotoxicity, Cell viability, signal transduction – Cell to cell recognition and adhesion, Cell signalling pathways.

Text Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1	Geoffrey M.Cooper and Robert E.Hausman	The Cell A Molecular Approach (Sixth Edition)	Ingram Publishers	2018 (Reprint)
2	Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter.	Molecular Biology of Cell. 6th Edition.	Garland Science, Taylor & Francis group Publishers	2017
3	Anne Wanjie	The Basics of Cell biology	Rosen Publishers	2013

Reference Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1	Griffith Reid	Cell biology(Meiosis & Mitosis)	Harsen and keller Education	2017
2	Jeff Hardin, Gregory Bertoni and Lewis J. Klein Smith	Becker's World of the Cell – Technology Update – 8 th Edition	Pearson Education Ltd.	2015
3	Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander D. Johnson, Julian Lewis, Martin Raff, Keith Roberts and Peter Walter.	Essential Cell Biology	Garland Science, Taylor & Francis group Publishers	2013
4	T.A. Brown.	Introduction to genetics: A molecular approach. 1st Edition.	Garland Science.	2011
5	Benjamin Lewin	Genes XI. 9th Edition.	Jones & Bartlett Learning.	2008
6	Lewin B	Genes IX.	Oxford University Press, London.	2007

CORE PRACTICAL – I
LAB IN CELL BIOLOGY

Semester – I	LAB IN CELL BIOLOGY	Hours/Week - 3	
Core Practical – I		Credits - 3	
Course Code - 19UBT1CC1P		Internal 40	External 60

Preamble

- To study about cells and their enumeration by appropriate techniques
- To study about the cell division and development.
- To study about the embryonic development

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Describe the basic instruments involved in Cell Biology	K1
CO 2	Demonstrate the morphology of various types of cells and their enumeration.	K1
CO 3	Illustrate the different types of cell division.	K2
CO 4	Outline a clear and concise idea about embryogenesis.	K2
CO 5	Identify the Barr body from Buccal Cells.	K2

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	L	M	M
CO2	M	M	M	L
CO3	M	L	L	M
CO4	S	M	L	M
CO5	L	L	L	L

S- Strong, M-Medium, L-Low

CORE PRACTICAL – I
LAB IN CELL BIOLOGY

1. Demonstration of Principles and working mechanism of Microscope and Microtome.
2. Morphological Characterization of various types of Plant tissue cells.
3. Structure observation of Prokaryotic cells.
4. Structure observation of Eukaryotic cells.
5. Enumeration of Eukaryotic cells (Yeast).
6. Enumeration of Red Blood Cells.
7. Enumeration of White Blood Cells.
8. Cell organelle separation by centrifugation methods.
9. Cell Division - Mitotic stages
10. Cell Division - Meiotic stages
11. Cell Division – Binary fission of yeast cells
12. Osmosis and Tonicity
13. Grading the stages of chick embryo development (demo only).
14. Barr body Identification in cells of Buccal Smear.

Reference Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1	Dr. William H. Heidcamp	Cell Biology Laboratory manual	Pearson Education	2017
2	David A. Thompson	Cell and Molecular Biology Lab. Manual.	Create Space Independent Publishing Platform	2011
3	P. Gunasekaran.	Laboratory Mannual in Microbiology.	New Age International.	2007
4	Mary L. Ledbetter.	Cell Biology: Laboratory Manual.	RonJon Publishing. Incorporated.	1993

FIRST ALLIED COURSE – I
GENERAL MICROBIOLOGY

Semester – I	GENERAL MICROBIOLOGY	Hours/Week – 4	
First Allied Course – I		Credits - 4	
Course Code - 19UBT1AC1		Internal 25	External 75

Preamble

- To study about the classification of microorganisms.
- To study about the media composition and their types
- To study about the structure and characteristics of bacteria, algae, fungi, protozoa and virus.

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Recall the history of Microbiology and list out the scopes.	K1
CO 2	Outline the methods involved in media preparation and sterilization.	K2
CO 3	Summarize the structural organization of Bacteria.	K2
CO 4	Explain the general characteristic features of Algae and Fungi.	K2
CO 5	Describe the Diversity, Ecology and Characteristics of different Protozoa and Viruses.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	L	L	L	M
CO3	M	M	M	M
CO4	M	M	S	M
CO5	M	M	S	S

S-Strong, M-Medium, L-Low

FIRST ALLIED COURSE – I
GENERAL MICROBIOLOGY

Unit I - History and Classification

12 Hours

Historical development of Microbiology - Theories of Spontaneous generation – Biogenesis
The scope of Microbiology; General principles and nomenclature – Haeckel's three kingdom concept, Whittaker's five kingdom concept- Carl Woese's three domain classification. Cavalier – Smith's Eight kingdom classification.

Unit II - Media Preparation and Sterilization

10 Hours

Media Composition and their types based on physical state & ingredients. Microbial Growth-Factors influencing the growth of Microorganisms – Growth Curve. Types of Sterilization and Disinfection.

Unit III – Bacteria

12 Hours

Structural organization of bacteria – Size, shape and arrangement of bacterial cells – Ultrastructure of a bacterial cell – cell wall, cell membrane, ribosomes, nucleoid, slime, capsule, flagella, fimbriae, spores , cysts, plasmid, mesosomes and cytoplasmic inclusions.

Unit IV – Diversity of Microbial world

13 Hours

General characteristics of Algae (*Chlamydomonas* sp) including occurrence, thallus organization, Ultra structure, pigments, flagella, eyespot, food reserves. Reproduction – Sexual and Asexual reproduction. Fungi (*Aspergillus* sp) – General characteristics of fungi including habitat, distribution, nutritional requirements, Ultrastructure, thallus organization and aggregation.

Unit V – Protozoa & Viruses

13 Hours

Protozoa: General characteristics with special reference to *Amoeba*, *Paramecium* and *Giardia*.
Viruses: Viruses, viroids and prions - A general introduction with special reference to the structure of the following: TMV, poliovirus. Lytic and lysogenic cycle.

Text Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1	Gerarad J.Tortora Berdell R.Funke and Christine L.Case	Microbiology An Introduction (11 th Edition)	Pearson Education	2018
2	Dr. C. P. Baveja	Text Book of Microbiology	Anja Publications	2017
3	A.K. Rathoure	Essentials of Microbiology	Brillion Publishing	2017

Reference Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1	Tortora, Funke and Case	Microbiology: An Introduction – 13 th Edition	Pearson	2018
2	Madigan M.T. Bender K.S. Buckley D.H Sattley W.M and Stahl D.A	Brock Biology of Microorganism(15 th Edition)	Pearson Education	2017
3	Prescott, Harley and Klein.	Microbiology. 10 th Edition.	McGraw Hill	2016
4	Pelczar, Chan and Kreig	Microbiology 9 th Edition.	McGraw-Hill.	2016
5	Michael T. Madigan, John M. Martinko and Kelley S Bender	Brock Biology of microorganisms	Pearson	2014

Semester – I	LAB IN MICROBIOLOGY	Hours/Week – 4	
First Allied Course – II		Credits – 2	
Course Code - 19UBT1AC1P		Internal 40	External 60

Preamble

- To acquire knowledge about aseptic techniques.
- To comprehend the various methods for identification of unknown microorganisms.
- To study about the Biochemical Characterization

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Illustrate the techniques involved in sterilization of media and glasswares.	K1
CO 2	Outline the methods for isolation and enumeration of microorganisms from different samples.	K2
CO 3	Demonstrate the various pure culture techniques and to measure the bacterial growth.	K2
CO 4	Identify the organisms by various staining techniques.	K3
CO 5	Apply various biochemical tests to characterize microorganisms.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	L	M
CO2	M	S	S	S
CO3	S	S	M	M
CO4	L	L	M	M
CO5	M	S	M	M

S- Strong, M-Medium, L-Low

1. Laboratory Rules and Regulations.
2. Sterilization Techniques – Media and Glasswares.
3. Media Preparation.
4. Isolation and Enumeration of Microorganisms from Water and Soil.
5. Pure Culture Techniques – Spread plate, Streak plate, Pour plate, Stab and Slant preparation.
6. Measurement of Bacterial Growth – Turbidometric method
7. Staining Techniques –Simple staining, Gram’s staining, Capsule Staining,
8. Lactophenol Cotton Blue Staining.
9. Cell Motility – Hanging drop technique.
10. Biochemical Characterization of microorganisms – IMViC tests.
11. Counting of Microbial colonies using colony counter.
12. Micrometry (Ocular and Stage).

Reference Books

S. No	Author name	Title of the book	Publishers name	Year of Publication
1	Joanne Willey, Linda Sherwood and Christopher J. Woolverton	Prescott’s Microbiology	Mc Graw Hill Education	2017
2	James G. Cappuccino	Microbiology - Laboratory Manual	Pearson	2017
3	Michael J. Leboffe & Burton E. Pierce	Microbiology: Laboratory Theory and Application, Brief.	Morton	2016
4	Mark Gladwin, William Trattler and C. Scott Mahan	Clinical Microbiology made Ridiculously simple – 6 th Edition	Medmaster	2016
5	Brown A and Smith	Benson’s Microbiological Application; Laboratory Manual in General Microbiology (13 th Edition)	Mc Graw Hill Companies	2015

SEM I	UNIVERSAL HUMAN VALUES	Category	Course Code	Instructional Hours	Credits
		Part IV	20UGVE	30	2

PREAMBLE

This course inculcates the basic human values among the students so as to make them responsible citizens of the Nation.

COURSE OUTCOMES

On the successful completion of this course, the students will able to

CO Number	CO Statement	Knowledge Level
CO1	Define the values of Love and Compassion	K1
CO2	Understand the value of Truth	K2
CO3	Explain the value of Non-violence	K3
CO4	Practice the values of Righteousness and Service	K3
CO5	Apply the values of Renunciation (sacrifice) & Peace	K4

Syllabus

Unit I: (5 Hours)

Love and Compassion

- **Introduction:** what is love? Forms of love for self, parents family friend, spouse community, nation, humanity and other beings both for living and non-living.
- Love and Compassion and Inter-relatedness

- Love, compassion, empathy, sympathy and nonviolence
- Individuals who are remembered in history for practicing compassion and love.
- Narratives and anecdotes from history, literature including local folklore
- Practicing love and compassion: what will learners learn gain if they practice love and compassion? What will learners lose if they Don't Practice love and compassion?
- Sharing learner's individual and/ or group experience(s)
- Simulated situations
- Case studies
 - Unit II: (5 Hours)*
 - Truth*
- **Introduction:** what is truth? Universal truth, truth as value, truth as fact (veracity. sincerity, honesty among others)
- Individuals who are remembered in history for practicing this value
- Narratives and anecdotes from history, literature including local folklore
- Practicing truth: what will learners learn/ gain if they practice truth? What will learners lose if there Don't Practice it?
- Learners' individual and/ or group experience(s)
- Simulated situations
- Case studies
 - Unit III: (5 Hours)Non*
 - Violence*
- **Introduction:** what is non violence? Its need. Love, compassion, empathy sympathy for others as pre-requisites for non violence
- Ahimsa as non -violence and non- killing.
- Individuals and organisations that are known for their commitment to non - violence
- Narratives and anecdotes about non - violence from history and literature including local folklore
- Practicing non-violence: What will learners learn/gain if they practice non- violence? What will learners lose if they don't Practice it?
- Sharing learner's individual and/ or group experience(s) about non - violence
- Simulated situations
- Case studies
 - Unit IV: (8 Hours)*
 - Righteousness and Service*
- **Introduction:** What are Righteousness and service?
- Righteousness and dharma, Righteousness and Propriety
- Forms of service for self, parents, family, friend, spouse, community, nation, humanity and other beings- living and non-living persons in distress for disaster.
- Individuals who are remembered in history for practicing Righteousness and Service Narratives and anecdotes dealing with instances of Righteousness and Service from history, literature, including local folklore
- Practicing Righteousness: What will learners learn/ gain if they practice righteousness and service? What will learners loose if they Don't Practice these values?
- Sharing learners individual and/ or group experience(s) regarding righteousness and service
- Simulated situations
- Case studies

Unit V : (7 Hours)

Renunciation (sacrifice) & Peace

- Introduction: what is renunciation? Renunciation and sacrifice. Self restraint and ways of overcoming greed. Renunciation with action as true renunciation. What is peace? It's need, relation with harmony and balance.
- Individuals who are recommended in history for practicing Renunciation and sacrifice. Individuals and organisations that are known for their commitment to peace.
- Narratives and anecdotes from history and literature including local folklore about individuals who are remembered for their renunciation and sacrifice. Narratives and anecdotes about peace from history and literature including local folklore practicing peace
- Practicing renunciation, sacrifice and Peace: What will learners learn/ again if they practice Renunciation, sacrifice and Peace? What will learners lose if there Don't
- Practice these values? Sharing
 - Learners individual and/ or group experience(s) about Renunciation, sacrifice and Peace Simulated situations
- Case studies

Semester – II	MOLECULAR BIOLOGY	Hours/Week – 6	
Core Course – II		Credits – 4	
Course Code - 19UBT2CC2		Internal 25	External 75

Preamble

- To study about the chromosomes, genes and their functions
- To study about the DNA damage and repair mechanism
- To study about the central dogma of molecular biology

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Describe the organisation and development of the genetic makeup on cellular, chromosomal and gene level.	K1
CO 2	Recall basic concepts of hereditary and population genetics.	K1
CO 3	Explain DNA replication and repair mechanism.	K2
CO 4	Summarise the mechanisms of transcription and translation	K2
CO 5	Outline the gene regulatory mechanisms.	K2

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	M	M	M
CO2	S	S	S	M
CO3	S	M	M	M
CO4	L	L	L	L
CO5	S	M	M	M

S-Strong, M-Medium, L-Low

Unit I – Genetic Material**18 Hours**

Structural organization of Chromatin and chromosome. Basic structure of Chromosomes; Chromosomal Proteins – Histones and Protamines. Special types of Chromosomes: Polytene and Lampbrush chromosomes. Experiments to prove DNA and RNA as the Genetic Material; Components, types & Structure of nucleic acids

Unit II – Classical Genetics**18 Hours**

Mendelein Inheritance, Laws of inheritance – single and dihybrid ratio. Linkage analysis – Fruit fly. Population Genetics – Hardy Weinberg Law, Developmental Genetics using *Drosophila melanogaster* as model system.

Unit III – DNA Replication and Repair**18 Hours**

DNA Replication- Prokaryotic and Eukaryotic DNA replication, enzymes and proteins involved in DNA replication. Models of replication – Semi-conservative, unidirectional, bidirectional, rolling circle mechanism. Inhibitors of DNA replication. DNA Damage and repair.

Unit IV – Transcription and Translation**18 Hours**

Transcription – Prokaryotic and Eukaryotic transcription, Enzymes involved in transcription. Post transcriptional modifications – 5' – CAP formation, 3' processing and polyadenylation, splicing. Translation – Prokaryotic and Eukaryotic translation, the translational machinery, mechanisms of initiation, elongation and termination, regulation of translation, Co-translational and post-translational modifications - Importance of Glycosylation and Phosphorylation.

Unit V – Gene Regulation**18 Hours**

Prokaryotes: *lac* operon, *gal* operon and *trp* operon. Eukaryotes: Gene loss, gene amplification, gene rearrangement.

Text Books

S.No.	Author name	Title of the book	Publishers name	Year of publication
1	David Clark, Nanette Pazdernik, Michaelle and Mc. Gehee	Molecular Biology – 3 rd Edition	Elsevier	2018
2	William S. Klug, Michael R. Cummings, Charlotte A. Spencer and Michael A. Palladino	Concepts of Genetics	Pearson Education India	2016
3	George M. Malacinski	Freifelder's Essentials of Molecular Biology	Viva	2015

Reference Books

S.No.	Author name	Title of the book	Publishers name	Year of publication
1	James D. Watson	Molecular Biology of the gene – 7 th Edition	Pearson	2017
2	Michael M. Cox, Jennifer Doudna and Michael O' Donnell	Molecular Biology – Principles and Practice	W.H. Freeman	2015
3	Bruce Alberts, Alexander Johnson. Julian Lewis, David Morgan, Martin Raff, Keith Roberts and Peter Walter.	Molecular Biology of Cell.	Garland Science publication	2014
4	Stanely R. Maloy, Jhon E Cornan Jr and David Freifelder.	Freifelder's Essentials of Molecular Biology.	Norosa Publishing House.	2013
5	George M. Malacinski and Burton E. Tropp.	Molecular Biology – Genes to Proteins.	Jones and Bartlett Publishers.	2012

CORE PRACTICAL – II
LAB IN MOLECULAR BIOLOGY

Semester – II	LAB IN MOLECULAR BIOLOGY	Hours/Week – 3	
Core Practical – II		Credits – 3	
Course Code - 19UBT2CC2P		Internal 40	External 60

Preamble

- To develop skills pertaining to Molecular Biology
- To study about the Quantification of Nucleic acids
- To study about Bacterial mutagenesis

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the methods for the isolation and purification of genomic DNA and plasmid DNA.	K1
CO 2	Outline the process of separation of DNA and protein by electrophoresis.	K2
CO 3	Apply the various methods for the quantification of nucleic acids.	K3
CO 4	Experiment with various gene transfer methods.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	M	M
CO3	L	L	M	M
CO4	S	S	S	S

S- Strong, M-Medium, L-Low

CORE PRACTICAL – II
LAB IN MOLECULAR BIOLOGY

1. Isolation and purification of Genomic DNA from Prokaryotes
2. Isolation and purification of Genomic DNA from Eukaryotes
3. Isolation and purification of Plasmid DNA
4. Separation of DNA by using AGE
5. Separation of Protein by using SDS- PAGE
6. Quantification of Nucleic Acids – DNA by chemical method
7. Quantification of Nucleic Acids – RNA by chemical method
8. Bacterial mutagenesis using Physical Method
9. Transformation
10. Conjugation
11. Transduction

Reference Books

S.No.	Author name	Title of the book	Publishers name	Year of publication
1	Andreas Hofmann and Samuel Clokie	Willson and Walker's Principles and Techniques of Biochemistry and Molecular Biology	Cambridge University Press	2017
2	George M. Malacinski	Freifeder's Essentials of Molecular Biology	Norosa Publishing House	2013
3	Dr. David Thompson	Cell and Molecular Biology Lab Manual	Norosa Publishing House	2011
4	J Sambrook and D. W. Russell	Molecular cloning: a laboratory manual Vol 1, 2 & 3	CSHL Press	2001

FIRST ALLIED COURSE- III
BIOINSTRUMENTATION

Semester – II	BIOINSTRUMENTATION	Hours/Week - 3	
First Allied Course – III		Credits – 3	
Course Code - 19UBT2AC2		Internal 25	External 75

Preamble

- To understand the working principles of different bioinstruments.
- To provide a better understanding of various analytical techniques
- To apply the principle of instruments in different fields.

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Define the principle of microscope and its various types	K1
CO 2	Demonstrate the various Electrophoretic techniques and its applications	K2
CO 3	Explain the principle, types and applications of Chromatographic techniques.	K2
CO 4	Outline the principle, types and applications of Colorimetry.	K2
CO 5	Summarize the principle, types and applications of Centrifugation.	K2

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	M	S
CO2	S	M	M	S
CO3	S	M	M	S
CO4	S	S	M	S
CO5	M	S	S	M

S-Strong, M-Medium, L-Low

FIRST ALLIED COURSE- III
BIOINSTRUMENTATION

Unit I – Microscopy

10 Hours

Introduction to Instrumentation, Microscope – Light Microscopy, Bright and Dark field Microscopy, Fluorescence Microscopy, Phase Contrast Microscopy, TEM, SEM.

Unit II – Electrophoresis

10 Hours

Principle and Applications of Electrophoresis –Types of electrophoresis- AGE, SDS-PAGE and 2 D gel; Blotting Techniques; Gel documentation.

Unit III – Chromatography

7 Hours

Fundamentals of Chromatography. Principle and its applications, Types – Paper, TLC, Column, Affinity, Ion –exchange, HPLC, GC-MS Chromatography.

Unit IV- Colorimeter

7 Hours

Colorimeter – Principle and its applications, Beer Lambert’s Law, Spectrophotometer-Principle and its applications, Types of Spectrophotometer-UV – Visible & IR.

UNIT V – Centrifugation and Tracer Techniques

11 Hours

Centrifugation – Principle, Types – Zonal, Differential and Density gradient centrifugation and its applications, Imaging Techniques- X-ray and NMR.

Tracer Techniques - Radioactive isotope – Half life, GM Counter, Liquid Scintillation Counter, Autoradiography.

Text Books

S.No.	Author name	Title of the book	Publishersname	Year of Publication
1	M. J. Reilly	Bioinstrumentation	CDS Publishers	2016
2	L. Veerakumari	Bioinstrumentation	MJP Publishers	2015
3	R. S. Khandpur	Handbook of Bio-Medical Instrumentation	Tata McGraw Hill.	2014
4	Carr and Brown	Introduction to Biomedical Equipment Technology	Pearson Education,	2001
5	J. Webster	Bioinstrumentation	Wiley and Sons	2000

Reference Books

S.No.	Author name	Title of the book	Publishers name	Year of Publication
1	Avinash Upadhyay, Niramalendu Nath and Kakoli Upadhyay	Biochemical Chemistry Principles and Techniques	Himalaya Publication	2009
2	P. Narayanan	Essentials of Biophysics	New Age International	2007
3	Vasantha Pattabhi and N. Gautham	Biophysics	Narosa	2004
4	Wilson and Walkar	A Biologist guide to principles and techniques of practical biochemistry	Cambrige University press	2000

ENVIRONMENTAL STUDIES

Semester II	Internal Marks :25	External Marks: 75				
Course Code	Course Title	Category	L	T	P	Credits
21UGES	Environmental Studies	Part IV	30	2	-	2

Preamble

To train the students to get awareness about total environment and its related problems and to make them to participate in the improvement and protection of the environment.

Course Outcome

COs	CO Statement	Knowledge Level
CO1	Outline the nature and scope of environmental studies	K2
CO2	Illustrate the various types of natural resources and its importance.	K2
CO3	Classification of various types of ecosystem with its structure and function.	K2
CO4	Develop an understanding of various types of pollution and biodiversity.	K3
CO5	List out the various types of social issues related with environment .	K4

Unit: 1

Introduction to environmental studies Definition, scope and importance.
Need for public awareness

Unit: 2

Natural Resources: Renewable and non-renewable resources:

- a) Forest resources: use and over-exploitation, deforestation, case studies. Timber

extraction, mining, dams and their effects on forests and tribal people.

- b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams benefits and problems.
- c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources.
- d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity.
- e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies.
- f) Land resources: Land as a resources, land degradation, man induced Landslides, soil erosion and desertification.

Role of an individual in conservation of natural resources.

Unit: 3 Ecosystems

- Concept, Structure and function of an ecosystem.
- Producers, consumers and decomposers
- Energy flow in the ecosystem and Ecological succession.
- Food chains, food webs and ecological pyramids
- Introduction, types, characteristic features, structure and function of the following ecosystem:-
 - a. Forest ecosystem
 - b. Grassland ecosystem
 - c. Desert ecosystem
 - d. Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)

Unit: 4 Biodiversity and Environmental Pollution

- Introduction, types and value of biodiversity
- India as a mega diversity nation
- Hot-spots of biodiversity
- Threats to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts.
- Endangered and endemic species of India
- Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.
- Definition, Causes, effects and control measures of :
 - a. Air Pollution
 - b. Water Pollution

c. Soil Pollution

d. Noise pollution

e. Nuclear hazards

- Solid waste Management: Causes, effects and control measures of urban and industrial wastes.
- E-Waste Management: Sources and Types of E-waste. Effect of E-waste on environment and human body. Disposal of E-waste, Advantages of Recycling E-waste.
- Role of an individual in prevention of pollution
- Disaster management: floods, earthquake, cyclone and landslides.

Unit: 5 Social Issues and the Environment

- Water conservation, rain water harvesting, watershed management.
- Climate change, global warming, acid rain, ozone layer depletion,
- Wasteland reclamation.
- Environment Protection Act
- Wildlife Protection Act.
- Forest Conservation Act.
- Population explosion – Family Welfare Programmes
- Human Rights - Value Education
- HIV/ AIDS - Women and Child Welfare
- Role of Information Technology in Environment and human health

References:

1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd Bikaner.
2. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt ltd, Ahamedabad – 380013, India, E-mail: mapin@icenet.net(R)
3. Brunner R.C. 1989, Hazardous Waste Incineration, McGraw Hill Inc 480 p
4. Clark R.S. Marine Pollution, Clarendon Press Oxford (TB)
5. Cunningham, W.P.Cooper, T.H.Gorhani E & Hepworth, M.T. 2001.
6. De A.K. Environmental Chemistry, Wiley Eastern Ltd
7. Down to Earth, Centre for Science and Environment (R)
8. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford University, Press 473p.
9. Hawkins, R.E. Encyclopedia of India Natural History, Bombay Natural History Society, Bombay (R)
10. Heywood, V.H & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge University Press 1140 p.
11. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws Himalaya Pub.

House, Delhi 284 p.

12. Mckinney, M.L. & Schoch R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition 639

13. Mhaskar A.K. Matter Hazardous, Techno-Science Publications (TB)

14. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)

15. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p

16. Rao MN & Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. PvtLtd 345 p.

17. Sharma B.K. 2001 Environmental chemistry Goel Publ House, Meerut.

18. Survey of the Environment, The Hindu (M).

19. Townsend C. Harper, J and Michael Begon, Essentials of Ecology, Blackwell science(TB)

20. Trivedi R.K. Handbook of Environmental Laws, Rules, Guidelines, Compliances andStandards, Vol. I and II, Enviro Media (R).

21. Trivedi R.K. and P.K. Goel, Introduction to air pollution, Techno-Science Publications(TB).

22. Wagner K.D. 1998 Environmental Management. W.B. Saunders Co. Philadelphia USA499 p

(M) Magazine (R) Reference (TB) Textbook

23. <http://nbaindia.org/uploaded/Biodiversityindia/Legal/33%20Biological%20Diversity%20Rules,%202004.pdf>.

CORE COURSE – III
rDNA TECHNOLOGY

Semester – III	rDNA TECHNOLOGY	Hours/Week - 6	
Core Course – III		Credits – 4	
Course Code - 19UBT3CC3		Internal 25	External 75

Objectives

- To illustrate the use of modern tools and techniques for manipulation and analysis of genomic sequences.
- To train students in strategizing research methodologies employing genetic engineering techniques.
- To expose students to the applications of recombinant DNA technology in biotechnological research.

Course Outcomes

On the Successful completion of the course the students would be able to

CO No.	CO Statement	Knowledge Level
CO1	Utilize Knowledge on various tools & principles in Genetic Engineering	K1
CO2	Recall the knowledge on creation of genomic libraries & explain the strategies in generating transgenics.	K2
CO3	Contrast the methods of gene cloning using different vectors & assessing a recombinant plasmid	K2
CO4	Technical knowhow on versatile techniques in Recombinant DNA Technology and to employ them in isolation procedures.	K3
CO5	Outline the applications of Genetic engineering in basic and applied biology, proficiency in designing and conducting experiments involving genetic manipulation for societal applications.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S-Strong, M-Medium, L-Low

CORE COURSE – III
rDNA TECHNOLOGY

Unit I **18 Hours**

Introduction to recombinant DNA (rDNA) technology. Steps involved in rDNA technology. Enzymes in rDNA technology. Restriction Enzymes -Types of Endonuclease and Exonuclease. DNA modifying enzymes - Polymerase, Transferase, Kinase, Ligase

Unit II **16 Hours**

Vectors; Cloning vectors - Plasmids, Cosmids, Phagemids. Viral vectors- Animal viral vectors - SV40 and Retrovirus. Plant viral vectors - CaMV vector and TMV vector. Shuttle vectors and Expression vectors - YAC, BAC - *S.cerevisiae* system as model.

Unit III **20 Hours**

Gene transfer techniques - Physical methods – Microinjection, Electroporation and gene gun. Chemical methods- CaCl₂ mediated and Polyethylene Glycol Mediated. Construction of Genomic libraries and cDNA libraries. Probe construction. DNA amplification using PCR - Concepts, Analysis of amplified products and Applications of PCR. Principles and applications of RFLP and RAPD.

Unit IV **18 Hours**

Recombinant selection and Screening. Selection methods - Antibiotics, Expression basis, GUS expression, Blue White Selection. DNA Sequencing - Chemical degradation, Chain termination, Automated sequence and Next Generation Sequencing - New sequencing methods. Site Directed Mutagenesis.

Unit V **18 Hours**

Applications of Genetic Engineering- Transgenic products - Bt Cotton, Golden rice, Flavr savr tomato, Humulin, Factor VIII, Transgenic mouse, Transgenic Fish. Xenotransplantation. Gene therapy - Types - Applications - SCID and Sickle cell anemia. Metagenomics.

Text Books

S.No	Author	Title	Publisher	Year of Publication
1	David Irvine	An Introduction to Genetic Engineering	Syrawood Publishing House	2018
2	Bernard R. Glick and Cheryl L. Patten	Molecular Biotechnology: Principles and Applications of Recombinant DNA. 5 th Edition	ASM Press, Washington DC	2017
3	Nessa carey	Junk DNA: A Journey through the Dark Matter of the Genome	Columbia University Press	2017
4	T. A. Brown	Gene Cloning and DNA Analysis: An Introduction. 7 th Edition	Wiley Blackwell	2016
5	Dr. Arun Dev Sharma	rDNA Technology. 2 nd Edition	Himalaya Publishing House	2014

Reference Books

S.No	Author	Title	Publisher	Year of Publication
1	Munis Dundar	Current Applications of Biotechnology	European Biotechnology Thematic Network Association	2015
2	Keya Chaudhuri	Recombinant DNA Technology	The Energy Resources Institute, TERI	2013
3	K. Rajagopal	Recombinant DNA Technology and Genetic Engineering	Tata Mc Graw Hill education Private Ltd.	2012
4	Jane K. Setlow	Genetic Engineering : Principles and Methods	Springer	2012
5	M.Wink	An Introduction to Molecular Biotechnology : Molecular Fundamentals Methods and Applications in Modern Biotechnology	Wiley Blackwell	2011

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment, Animations.

Web Links

1. https://youtube.be/Yh9w_fyvpUk
2. www.bx.psu.edu/~ross/workmg/Isolat_analyz_genes_Chpt3.htm
3. www.biologydiscussion.com/essay/tools-of-recombinant-dna-technology-essay-tools- biotechnology/75954
4. <https://youtube.be/D3If9ycpyXM>

CORE PRACTICAL - III
LAB IN rDNA TECHNOLOGY

Semester – III	LAB IN rDNA TECHNOLOGY	Hours/Week - 3	
Core practical – III		Credits – 3	
Course Code - 19UBT3CC3P		Internal 40	External 60

Objectives

- ❖ To acquire a skills about the various techniques in recombinant DNA technology.
- ❖ To understand the types of enzymes used to produce recombinants.
- ❖ To study about the experiments involving genetic manipulation.

Course Outcomes

On the Successful completion of the course the student would be able to

CO No.	CO Statement	Knowledge Level
CO1	Demonstrate the genomic DNA isolation method from different sources.	K1
CO2	Describe the method of Agarose Gel Electrophoresis.	K2
CO3	Illustrate about the restriction digestion and ligation of DNA.	K2
CO4	Outline a clear and concise idea about transformation.	K3
CO5	Identify the recombinant DNA products.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S-Strong, M-Medium, L-Low

CORE PRACTICAL - III
LAB IN rDNA TECHNOLOGY

1. Isolation of genomic DNA from plant tissue.
2. Isolation of genomic DNA from Animal cells.
3. Isolation of genomic DNA from Bacteria.
4. Isolation of Plasmid DNA.
5. Size analysis of DNA by Agarose Gel Electrophoresis.
6. Restriction digestion of DNA.
7. Ligation.
8. PCR amplification *.
9. Preparation of competent cells *E.coli* cells*.
10. Transformation of *E.coli* with Plasmid DNA using CaCl₂ *.
11. Southern blotting*.

* Practical by demonstration only

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Siddra I, Imran ULH	Recombinant DNA Technology. 1 st Edition	Cambridge Scholar	2019
2	Tiwari S, Sharma M.	Recombinat DNA Technology in the synthesis of Human Insulin	LAP LAMBERT Academic Publishing	2018
3	Rajalakshmi AG	Manual on Plant Biotechnology and Recombinanat DNA Technology	LAP LAMBERT Academic Publishing	2017
4	Sambrook, J and Russel DW	Molecular Cloning : A laboratory Manual – 4 th Edition	Cold Spring Harbor, N.Y. : Cold Spring Harbor Laboratory Press.	2012
5	Ashok Kumar	Molecular Biology and Recombinant DNA Technology : Practical Manual Series (Volume II)	Narendra Publishing House	2011

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment.

Web Links

1. http://www.biology.arizona.edu/molecular_bio/problem_sets/Recombinant_DNA_Technology/recombinant_dna.html.
2. http://www.genome.ou.edu/protocol_book/protocol_index.html.
3. http://www.biology.arizona.edu/molecular_bio/problem_sets/Recombinant_DNA_Technology/recombinant_dna.html

SECOND ALLIED COURSE – I
BIOMOLECULES AND BASICS OF NANOTECHNOLOGY

Semester – III	BIOMOLECULES AND BASICS OF NANOTECHNOLOGY	Hours/Week – 4	
Second Allied Course – I		Credits – 4	
Course Code – 21UBT3AC2		Internal 25	External 75

Objectives

- To make the students understand the basics of biomolecules.
- To study structural and functional properties of carbohydrates, proteins and lipids
- Acquire knowledge about fundamentals of nanotechnology.
- To study nanomaterial synthesis and characterization by various methods.

Course Outcome

On the Successful completion of the course the student would be able to

CO No.	CO Statement	Knowledge Level
CO1	Understand the structures and functions of biomolecules- Carbohydrate, proteins and Lipids	K1
CO2	Summarize the fundamentals of nanotechnology	K2
CO3	Illustrate the different classes of nanomaterials	K3
CO4	Apply their knowledge on various methods of synthesis and characterization of nanomaterials.	K3
CO5	Infer the application of nano capsules in agriculture	K4

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	M	S	M	M
CO3	M	M	M	M
CO4	M	M	M	M
CO5	S	S	S	S

S-Strong, M-Medium, L-Low

SECOND ALLIED COURSE – I
BIOMOLECULES AND BASICS OF NANOTECHNOLOGY

Unit I – Carbohydrates and proteins

12 Hours

Carbohydrates: Definition, Classification and properties of carbohydrates. Structure and function of Monosaccharides, Disaccharides, Polysaccharides, Nano lignocellulosic material.

Proteins: Amino acids –Essential and Non - Essential Amino acids. Proteins - Classification of Proteins, Properties - solubility, Denaturation, Renaturation, Structural organization of Proteins - Primary, secondary, tertiary & quaternary structure.

Unit II - Lipids and Nucleic acids

12 Hours

Lipids: Introduction to Lipids. Classification of lipids - Simple lipids, Compound lipids and Derived lipids. Structure and function of phospholipids, Triacylglycerols, Glycerophospholipids, Sphingolipids and Cholesterol.

Nucleic acids: Purines, Pyrimidines - Structure & function, Nucleosides, Nucleotides. Nucleic acids - DNA - Double helical structure and Biological importance, RNA - Structure, Types & *Biological Importance*[#].

Unit III- Introduction to Nanotechnology

12 Hours

Definition and historical development of nanomaterials. Different Classes of Nanomaterials- Classification based on dimensionality - Quantum dots, Carbon-based nano materials, Carbon nanotubes, Metal based nano materials, Metal oxide based nano materials, Nanocomposites and Nanopolymers, Biological nanomaterials.

Unit IV - Synthesis of Nanomaterials

12 Hours

Physical methods: Ball milling and Electrodeposition techniques. Chemical methods: Metal nanocrystals by reduction and Solvothermal synthesis. Biological Methods: Synthesis, Mechanism of Microbial mediated nanomaterials-Bacteria, Fungi; Plant mediated nanomaterials. Advantages of Microbial and *Plant Mediated nanomaterials*[#].

Unit-V- Characterization and Applications of nanomaterials.

12 Hours

Characterization of Nanomaterials - UV-VIS, FTIR, DLS, Field emission scanning electron microscopy (FESEM). High resolution transmission electron microscope (HRTEM).

Applications of nanomaterials in Food, Agriculture, Medicine and Environmental protection.

Self Study Topics

Course Designer: Dr.R. UMA MAHESWARI

Text Books

S.No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	Thomas Varghese and K.M. Balakrishna	Nanotechnology: An Introduction to Synthesis, Properties and Applications of Nanomaterials	Atlantic	2021
2	T. Pradeep	A Textbook of Nanoscience and Nanotechnology	McGraw Hill Education	2017
3	Asim K Das and Mahua Das	An Introduction To Nanomaterials And Nanoscience	CBS	2020
4	Naik Pankaja	Essentials Of Biochemistry	Jaypee Brothers Medical Publishers(P) Ltd	2017
5	U. Sathyanarayana and U Chakrapani	Biochemistry-5 th edition	Generic	2019
6	Dr. Mrs Padmaja H. Agarkar, Dr Yogesh kulkarni and Dr Rammohan Rao	Biochemistry	Nirali Prakashan	2019

Reference Books

S.No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	M. A. Shah and K. A. Shah	Nanotechnology	Wiley	2019
2	Charles P. Poole, Jr. Frank and J. Owens	Introduction to Nanoscience and Nanotechnology, An Indian Adaptation	Wiley	2020
3	Dr. Swapnil Yadav	Biomolecules and Cell Biology	Mahaveer Publications	2020
4	R. Appling Dean, J. Anthony-Cahill Spencer, K. Mathews Christopher	Biochemistry: Concepts and Connections	Pearson Education	2017
5	Nelson, D. L.; Cox, M. M.; Lehninger	Principles of Biochemistry, 7th Edition.	Pearson Education	2017
6	Jeremy M. Berg, Lubert Stryer, John Tymoczko , Gregory Gatto	Biochemistry	Freeman and Company	2019

Web links

1. <https://nptel.ac.in/courses/102105034/>
2. <https://youtu.be/DhwAp6yQHQI>
3. <https://youtu.be/YWEiQIEUFak>
4. <https://youtu.be/f7jRpniCsaw>
5. <https://youtu.be/ZqoX2W1N6lO>

Pedagogy

Chalk and Talk, Power point presentation, Group Discussion, Seminar, Video class, Quiz, Assignment.

SECOND ALLIED COURSE – II
LAB IN BIOMOLECULES AND NANOTECHNOLOGY
2021 – 2022 Onwards

Semester – III	LAB IN BIOMOLECULES AND NANOTECHNOLOGY	Hours/Week – 3	
Second Allied Course – II		Credits – 2	
Course Code – 21UBT3AC2P		Internal 40	External 60

Objectives

- To impart the students with hands on skills related to biochemical techniques.
- To enable the students to perform qualitative and quantitative analysis of biomolecules.
- To make the students separate plant pigments using chromatographic techniques.
- To gain knowledge of structure, properties, manufacturing of metal nanoparticles.

Course Outcome

On successful completion of the course, students will be able to

Co Number	CO STATEMENT	Knowledge Level
CO 1	Outline the qualitative analysis of Biomolecules.	K1
CO 2	Understand the methods for the estimation of Glucose.	K2
CO 3	Describe the process of separation of plant pigments by chromatographic techniques.	K3
CO 4	Demonstrate the synthesis, characterization and analysis of antibacterial activity of metal nanoparticles.	K3

Mapping with Programme Outcomes

Cos	PO 1	PO 2	PO 3	PO 4
CO 1	S	S	S	S
CO 2	S	S	S	S
CO 3	S	S	S	S
CO 4	M	M	M	M

S – Strong, M – Medium, L- Low

SECOND ALLIED COURSE – II
LAB IN BIOMOLECULES AND NANOTECHNOLOGY
2021 – 2022 Onwards

1. Units and Measurements
2. Preparation of Molarity, Normality solutions and Buffers.
3. Determination of p^H and use of p^H meter.
4. Qualitative analysis of Carbohydrates
5. Qualitative analysis of proteins
6. Qualitative analysis of Lipids.
7. Estimation of Glucose by DNS method.
8. Experiment on plotting calibration curve with standards
9. Separation of plant pigments using Chromatographic techniques – TLC, Paper chromatography
10. Separation of Blood, plasma and Serum.
11. Synthesis of silver nanoparticles (AgNP) using plant extract
12. Synthesis of sol - gel Nanoparticles.
13. Biocompatibility of Nanoparticles – Hemolytic assay.
14. Characterization of nanoparticles – FTIR, UV-VIS, TEM, SEM, DLS. (Demo).
15. Antibacterial activity of metal nanoparticles.

Course Designer

Dr. R. RAMESHWARI

Reference Books

S.No	Authors	Title of Book	Publishers Name	Year of Publication
1	Koch C.C	Nanostructured Materials: Processing, Properties and Applications	Imperial College Press	2018
2	Ghuzang G, Cao	Nanostructures and Nanomaterials: Synthesis, properties and applications	Imperial College Press	2014
3	Sergeev GB.	Nanochemistry	Elsevier	2014
4	Rao CNR, Muller A Cheentham AK.	Chemistry of Nanomaterials	Wiley VCH	2013
5	Brechignac C, Hody P, Lahamani M	Nano materials and Nano chemistry	Springer Publications	2013
6	Edelstein AS and Cammarata RC.	Nanomaterials: Synthesis, properties and applications	Taylor and Francis	2012

E- Books

- <https://www.pdfdrive.com/introduction-to-nanomaterials-and-nanotechnology-e7096944.html>
- <https://www.pdfdrive.com/nanomaterials-and-nanotechnology-e25902292.html>
- <https://www.pdfdrive.com/introduction-to-nano-basics-to-nanoscience-and-nanotechnology-e176037191.html>
- <https://www.pdfdrive.com/nanotechnology-principles-and-practices-e36381054.html>
- <https://www.pdfdrive.com/handbook-of-research-on-nanoscience-nanotechnology-and-advanced-materials-e186744468.html>

Web Links

- <https://www.youtube.com/watch?v=IFYs3XDu4fQ>
- <https://www.youtube.com/watch?v=GZWGWEYWdyw>
- <https://www.youtube.com/watch?v=W11HYiJMvYg>
- <https://www.youtube.com/watch?v=wK7ue8Uesbw>
- <https://www.youtube.com/watch?v=fISqIOjoxRs>

Pedagogy

Practical Observation and Demo

NON MAJOR ELECTIVE – I
BASICS OF BIOTECHNOLOGY

Semester – III	BASICS OF BIOTECHNOLOGY	Hours/Week – 2	
Non Major Elective – I		Credits – 2	
Course Code – 19UBT3NME1		Internal 25	External 75

Objectives

- To understand the basic concepts of Biotechnology
- To familiarize with the basic tools and techniques employed in Biotechnology
- To understand the applications of biotechnological aspects in various fields

Course Outcomes

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge level
CO1	Understand the basic concepts and significant findings in the field of biotechnology.	K1
CO2	Understand the structure and function of cells and organelles	K2
CO3	Learn the basic structure of DNA, RNA and understand the flow of genetic information	K2
CO4	Apply the existing techniques in waste management	K3
CO5	Explore more advanced application based aspects in biotechnology	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	M	S	M
CO2	L	M	M	M
CO3	S	M	S	M
CO4	S	S	S	M
CO5	S	S	M	M

S – Strong, M – Medium, L - Low

NON MAJOR ELECTIVE – I
BASICS OF BIOTECHNOLOGY

Unit I **4 Hours**

Biotechnology: Definition, Brief history of biotechnology, Scope and branches of biotechnology.

Unit II **7 Hours**

Introduction to cells - Discovery of cells and cell theory- Types of cells -Structure of prokaryotic (Bacteria) and eukaryotic cells (Plant and Animal).

Unit III **6 Hours**

Structure and components of nucleic acids, Forms of DNA and types of RNA, DNA as genetic material – Hershey and Chase and Griffith’s experiment. RNA as genetic material- TMV.

Unit IV **6 Hours**

Biotechnology for solid and liquid waste management - Bioremediation, Biodegradation, Bioleaching and waste water treatment. Degradation of xenobiotics, Oil spills – Superbugs.

Unit V **7 Hours**

Applications of biotechnology in various fields — Food – Algae (SCP) and Fungi (Mushroom), Pharmaceutical– probiotics (*Lactobacillus*). Biofertilizers – Rhizobium, Biofuel - Ethanol.

Text books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	William J Thieman and Micheal A. Palladino	Introduction to Biotechnology	Pearson	2014
2	R. C. Dubey	A text book of Biotechnology	S Chand	2014
3	U. Satyanarayana	Biotechnology	Books and Allied (P) Ltd.	2008
4	Gerald Karp, Janet Iwasa, Wallace Marshall	Karp's Cell Biology, 8th Edition	Wiley – Blackwell	2018
5	Michael Pelczar, E.C.S. Chan, Noel R. Krieg	Microbiology	Tata McGraw – Hill	2001

Reference books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	David L. Nelson and Michael M. Cox	Lehninger Principles of Biochemistry	W. H. Freeman	2017
2	Jeremy W Dale and Malcolm Von Schantz	From genes to genome	Willey - Blackwell	2011
3	Alberts, Johnson, Lewis, Morgan, Raff, Roberts and Walter	Molecular biology of the cell	W.W. Norton & Co	2014
4	Peter Stanbury, Allan Whitaker and Steve Hall	Principles of fermentation technology	Butterworth - Heinemann	2016
5.	Keith Wilson and John Walker	Principles and techniques of biochemistry and Molecular Biology	Cambridge University Press	2010

Pedagogy

Powerpoint presentation, Simulation, Animated videos, Lab and industrial visits, Group Discussion, Seminar and Assignment.

Web links

1. www.sciencedirect.com
2. <https://www.ncbi.nlm.nih.gov/pubmed/>
3. <https://nptel.ac.in/courses/102103045/>
4. <http://www.nih.gov>
5. <http://www.nas.edu>

CORE COURSE – IV
IMMUNOLOGY

Semester – IV	IMMUNOLOGY	Hours/Week – 5	
Core Course – IV		Credits – 4	
Course Code – 19UBT4CC4		Internal 25	External 75

Objectives

- To know about the immune system and their functions.
- To acquire knowledge about the vaccines and its types.
- To study about the cellular responses in immune system.
- To know the significance of various immunological disorders and their remedies

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the types of cells involved in immune system.	K1
CO 2	Describe the agents of nonspecific immunity.	K2
CO 3	Illustrate about the structure and functions of immunoglobulins and monoclonal antibodies.	K2
CO 4	Outline the clear and concise idea about Vaccines	K3
CO 5	Obtain Knowledge in transplantation and tumor immunology.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S- Strong, M- Medium, L-Low

CORE COURSE – IV

IMMUNOLOGY

Unit I - Fundamental Concepts and Anatomy of the Immune system **12 Hours**

Basics of Immunology - Terminology - antigen, immunogen, hapten, super antigen, allergen, antigenicity, immunogenicity, immunoglobulin, antibody, epitope, paratope, tolerogen. Organs of immune system, tissues of immune system, cells of immune system and mediators of immune system. Lymphoid organs: Primary lymphoid organs (Thymus, Bone marrow), Secondary lymphoid organs (Spleen, Lymph node, MALT). Haematopoiesis and differentiation; Haematopoietic stem cells, T-cells, B-cells, Macrophages, Monocytes, Polymorphs, Platelets and Null cells. Immunity: Innate and acquired immunity. Theory of clonal selection.

Unit II - Cellular Responses **12 Hours**

T- Cells and B- Cells: Development, maturation, activation and differentiation. Antigen: Properties and Biology. Factors affecting antigenicity – Super antigens, epitopes, haptens, adjuvants and vaccines; Antigen –antibody binding; Immunoglobulin: Structure, functions and Classifications. Monoclonal antibodies - Principles and applications; APC's, MHC, antigen processing and presentation, regulation of T and B cell responses.

Unit III - Non specific Immunity **12 Hours**

Natural built in barriers – skin, semen, saliva, tears, enzymes. Mediators of immune system - lymphokines, cytokines, interferon, tumor necrosis factor. Complement components, natural killer cells, macrophages, phagocytosis, pinocytosis. Inflammatory response. Mucosal and Gut associated lymphoid tissue (MALT and GALT) and mucosal immunity.

Unit IV - Vaccinology **12 Hours**

Active, passive and combined immunization. Live, killed, attenuated, plasma derived, sub unit, recombinant DNA, protein based, plant-based, peptide, anti-idiotypic and conjugate vaccines – production and applications. Role and properties of adjuvants and ISCOMS.

Unit V - Transplantation and Tumor Immunology **12 Hours**

Transplantation: Mechanism, Types of Grafts[#], Graft rejection, General and specific immunosuppressive therapy; Clinical transplantation; - Hypersensitivity - Type I-IV; Tumor immunology; Autoimmunity: Autoimmune diseases, diagnosis and treatment.

Self Study Topics

Text Books

S.No	Author	Title	Publisher	Year of Publication
1	Lauren M.Sompayrac	How the Immune system works. 6 th Edition	Wiley Blackwell	2019
2	Dr.P.Madhav Latha	A Textbook of Immunology	S.Chand Publishing	2018
3	Abul K.Abbas, Andrew H.Lichtman Shiv Pillai	Cellular and Molecular Immunology. 9 th Edition	Elsevier	2017
4	Warren Levinson	Review of Medical Microbiology and Immunology	Mc Graw Hill Education	2016
5	Paul	Fundamental Immunology. 7 th Edition	Lippincott Williams and Wilkins	2012
6	Louis Hawley Richard J Ziegler Benjamin L Clarke	BRS Immunology and Microbiology (6 th Edition)	Lippincott Williams and Wilkins	2015

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Abul K.Abbas, Andrew H.Lichtman Shiv Pillai	Basic Immunology. 6 th Edition	Elsevier	2019
2	Jenni Punt, Sharon Stranford, Patricia Jones, Judith Owen	Kuby Immunology. 8 th Edition	ML IE PRNT	2018
3	Peter , J.Delves,Seamus J.Martin, Dennis R.Burton, Ivan M.Roitt	Roitt's Essential Immunology. 1 st Edition	Wiley Blackwell	2017
4	Kenneth Murphy, Casey Weaver	Janeway's Immunobiology. 9 th Edition	Garland Science	2016
5	Kathy M.Durkin	Understanding the Vaccines and the Immune system. 1 st Edition	Nova Science.Pub.Inc	2010

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment

Weblinks

- <https://youtu.be/Ktry4gGC2nA>
- <https://youtu.be/GY87mHuuwok>
- <https://youtu.be/edIPKRAKa-Y>
- Immunology Link Home Page.

CORE PRACTICAL – IV
LAB IN IMMUNOLOGY

Semester – IV	LAB IN IMMUNOLOGY	Hours / Week – 03	
Core Practical – IV		Credits – 03	
Course Code - 19UBT4CC4P		Internal 40	External 60

Preamble

- To Study about the Identification of Blood Group.
- To Enumerate the Blood Cells
- To Study about the Immunoelectrophoresis Techniques
- Enable the students with diagnostic skills for identification of certain diseases and immunological techniques.

Course Outcomes

On Successful Completion of the Course, Students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the methods to Identify the Blood Cells	K1
CO 2	Experiments for Enumeration of Blood Cells	K3
CO 3	Techniques for Plasma and Serum Separation and Identify the Blood Groups	K3
CO 4	Apply the diagnostic skills for identification of certain diseases, immunological techniques.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	M	S	S
CO2	S	S	M	L
CO3	M	S	M	S
CO4	S	M	L	M

S – Strong, M – Medium, L - Low

CORE PRACTICAL – IV
LAB IN IMMUNOLOGY

1. Identification of Cells in a Blood Smear.
2. Blood Cell Counting using Haemocytometer
3. Separation of Serum and Plasma
4. Identification of Blood Group
5. Latex Agglutination Test
6. Single Radial Immunodiffusion
7. Precipitation Reaction – AGD
8. Rocket Immunoelectrophoresis.
9. Testing for Typhoid Antigens - Widal Test
10. AMES TEST
11. DOT ELISA
12. Pregnancy Test – HCG
13. Rapid Plasma Reagin Test
14. Route of Immunization by Virtual
15. Breeding and Maintenance of Laboratory Animals by Virtual

Reference books

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	Senthilkumar Balakrishnan, Karthik Kaliaperumal, Senbagam Duraisamy	Practical Immunology A Laboratory Manual	LAP LAMBERT Academic Publishing, Germany	2017
2	Wilmore C. Webley	Immunology Laboratory Manual	LAD Custom Publishing, Georgia.	2017
3	Barbara Detrick, John L Schmitz, Robert G Hamilton	Manual of Molecular and Clinical Laboratory Immunology – 8 th Edition	ASM Press, Washington, DC.	2016
4	Christine Dorresteyn Stevens	Clinical Immunology and Serology: A Laboratory Perspective	F.A.Davis Company, Philadelphia	2016
5	G.P.Talwar and S.K.Gupta	A Handbook of Practical and Clinical Immunology	CBS, Publications, Delhi, India	2012

SECOND ALLIED COURSE- III
PLANT ANATOMY AND PHYSIOLOGY

Semester – IV	PLANT ANATOMY AND PHYSIOLOGY	Hours/Week – 3	
Second Allied Course- III		Credits – 3	
Course Code –19UBT4AC4		Internal 25	External 75

Objectives

- To acquire knowledge about anatomical structure of plants
- To comprehend the biochemistry of plant metabolism
- To study about the application of plant growth regulators in agriculture
- To acquire complete knowledge about the biochemical pathways in plants

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Compare the account of anatomy of Dicot stem and Monocot stem	K2
CO 2	Classify the internal structure of Dicot root and Monocot root	K2
CO 3	Sketch the various pathway for translocation of minerals in plants	K3
CO 4	Analyse the utilization of plant hormones in agriculture	K4
CO 5	Design various biochemical pathways to characterize C3 and C4 plants	K6

Mapping with Programme Outcomes

COs	PO1	PO2	PO3	PO4
CO1	M	S	L	M
CO2	M	S	S	S
CO3	S	S	S	S
CO4	L	L	M	M
CO5	M	S	M	M

S- Strong, M-Medium, L-Low

SECOND ALLIED COURSE- III
PLANT ANATOMY AND PHYSIOLOGY

Unit I - Plant anatomy **9 Hours**

Meristems: Characteristics, classification and theories of root - shoot apical meristem. The cambium: Types and functions. Simple Plant tissues: Types, Structure and functions. Comparative account of anatomy of Dicot stem (Sunflower) and Monocot stem (Maize), Dicot root (Sunflower) and Monocot root (Maize). Dicot Leaf and Monocot leaf

Unit II - Transportation in Plants **9 Hours**

Translocation of water in xylem and Translocation of food in Phloem. Water uptake: imbibitions, diffusion, osmosis, water potential and its components. Ascent of sap - Transpiration - Guttation. Stomatal physiology. Plant responses to Stress- biotic Stress-unwanted weeds, insects, bacteria, fungus, virus and abiotic Stress-Drought, high salinity, cold and heat.

Unit III - Plant Growth Development **9 Hours**

MS Medium and its composition in Plant tissue Culture for Plant Growth Development. Measurement of plant growth- growth curve. Plant growth regulators (PGR) - Auxins, Gibberellins, Cytokinins, Ethylene and Abscisic acid. Plant growth regulators in agriculture – Merits and demerits of PGR in agriculture.

Unit IV - Morphogenesis **9 Hours**

Photomorphogenesis- Photoperiodism, Vernalisation, Phytochrome, Biological clock. Physiology of germination. Dormancy – causes and types of dormancy. Seed dormancy- Causes of Seed dormancy, Types of Seed dormancy-Innate, Enforced and Induced dormancy. Methods of Breaking Seed Dormancy. Importance of seed dormancy.

Unit V - Photosynthesis and Respiration **9 Hours**

Photosynthesis: Photosynthetic pigment systems - radiant energy - cyclic and noncyclic electron transport - C₃ and C₄ pathways - factors affecting photosynthesis - photorespiration
Respiration: Aerobic - anaerobic, Glycolysis, Krebs's cycle, oxidation - reduction potential, ATP synthesis, Factors affecting respiration[#].

Self Study Topic

Text books

S.No.	Author	Title	Publisher	Year of Publication
1	Lincoln Taiz, Eduardo Zeiger , Ian Max Moller , Angus Murphy	Fundamentals of Plant Physiology-1 edition	Sinauer Associates is an imprint of Oxford University Press	2018
2	Crang, Richard, Lyons-Sobaski, Sheila, Wise, Rober	Plant Anatomy A Concept-Based Approach to the Structure of Seed Plants	Springer International Publishing	2018
3	Bhatla, Satish C, Lal, Manju A.	Plant Physiology, Development and Metabolism	Springer Singapore	2018
4	Ava Metcalfe	Integrative Plant Anatomy	Tritech Digital Media	2019
5	Alexander James	Plant Physiology, Biochemistry And Biotechnology	Tritech Digital Media	2019

Reference Books

S.No.	Author	Title	Publisher	Year of Publication
1	Neil Willey	Environmental Plant Physiology	Taylor and Francis Inc	2016
2	Clive Koelling	Plant Anatomy, Morphology and Physiology	Syrawood Publishing House	2016
3	Taiz.L, Zeiger.E, Moller.M and Murphy.A	Plant Physiology and Development (VI Edition)	Sinauer Associates,Inc.Publishers ,Massachusetts,USA	2015
4	Taylor A. Steeves and Vipen K. Sawhney	Essentials of Developmental Plant Anatomy	OUP USA	2017
5	Taiz.L, Zeiger.E, Moller.M and Murphy.A	Fundamentals of plant Physiology	Sinauer Associates, Inc	2018
6	Bob B.Buchanan, Wilhelm Gruissem, and Russell L.Jones	Biochemistry & molecular Biology ofplants	John Wiley & Sons, Ltd	2015

Pedagogy

PowerPoint presentation, Video lectures, Group discussion, Seminar, Assignment

Web links

- https://swayam.gov.in/nd2_cec19_bt01/preview
- <https://www.askiitians.com/biology/plant-physiology/>
- <https://biology.ufl.edu>
- <https://labs.eemb.ucsb.edu>
- <https://employees.csbsju.edu>

NON MAJOR ELECTIVE – II
APPLIED BIOTECHNOLOGY

Semester – IV	APPLIED BIOTECHNOLOGY	Hours/Week – 2	
Non Major Elective – II		Credits – 2	
Course Code – 19UBT4NME2		Internal 25	External 75

Preamble

- To understand the fundamental principles of biotechnology
- To appreciate the techniques involved in the field of biotechnology
- To recognize the application of genetically modified organisms in various fields like agriculture, livestock, medicine and environment.
- To familiarize with the basic principles of biotechnology employed in forensic science and medicine.

Course Outcomes

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge level
CO1	Define the importance of biotechnology in the field of life science	K1
CO2	Outline the principle and application of biotechnology in food industry	K2
CO3	Explain the efficiency of microbes in waste treatment and pollution control	K2
CO4	Apply the concept of DNA fingerprinting in forensic science	K3
CO5	Interpret regulations and guidelines for ensuring biosafety measures for protection of public health and environment.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	L	M	M
CO2	M	M	L	M
CO3	S	M	S	M
CO4	M	L	L	M
CO5	L	M	L	M

S – Strong, M – Medium, L - Low

NON MAJOR ELECTIVE – II
APPLIED BIOTECHNOLOGY

Unit I

6 Hours

Biotechnology in the field of Agriculture – History of Genetic modification in Agriculture - Genetically modified Crops – Advantages and Applications - Bt Cotton (Pest resistant), Flavr Savr Tomato (Shelf life improvement), Golden Rice (Rich in Vitamin A), Soybean (Rich in oleic acid content).

Unit II

6 Hours

Introduction to Food Biotechnology, Principle of Fermentation process. Production of food products – Bread, Dairy, Confectionery and Beverages, Meat, Poultry and Fish products. Food processing and preservation.

Unit III

6 Hours

Introduction to Environmental Biotechnology. Pollution – Source & types[#]. Health hazards due to pollution. Xenobiotics. Detection of Environmental pollutant - Biosensors. GMOs in Environmental clean-up. Health and Hygiene. Environmental standards and Quality monitoring.

Unit IV

6 Hours

Importance of Biotechnology in Forensic science. Principle of DNA fingerprinting. Application of DNA profiling in forensic medicine - Solving violent crimes such as murder and rape – Blood & Semen Sample; solving maternal & paternal disputes. Forensic Science Laboratories in India.

Unit V

6 Hours

Biosafety guidelines and regulations - Importance and Operation. Role of Biosafety Committees - IBSC, RDAC, RCGM, GEAC. Environmental release of GMOs, Risk assessment and management.

Self Study Portion

Text books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Varsha Gupta, Manjistha Sengupta, Jaya Prakash and Baishnab Charan Tripathy	Basic and Applied aspects of Biotechnology	Springer	2017
2	Malik Zainul Abdin, Usha Kiran, Kamaluddin and Athar Ali	Plant Biotechnology: Principles and Applications	Springer	2017
3	Firdos Alam Khan	Biotechnology Fundamentals	CRC Press	2016
4	Ashish S. Verma, Anchal and Singh	Animal Biotechnology –Models in Discovery and Translation	Elsevier	2014
5	A. K. Chakravarthy	Introduction to Environmental Biotechnology – Second Edition	OUP, India	2013

Reference books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Pessarakli M	Handbook Of Plant And Crop Stress	Taylor and Francis	2020
2	Foster G. N.	Food Biotechnology	CBS Publishers	2020
3	Chawla H. S.	Introduction to Plant Biotechnology	Oxford and IBH Publishing	2017
4	Allen K	Environmental Biotechnology	CBS Publishers	2016
5	Petre M	Advances In Applied Biotechnology	INTECH	2016
6	Daniel Vallero	Environmental Biotechnology – A Biosystems Approach	Academic Press	2015

Pedagogy

Power point presentation, Group Discussion, Seminar, Assignment.

Web links

- <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=16>
- http://www.goldenrice.org/Content2-How/how1_sci.php
- http://fsl.delhi.gov.in/wps/wcm/connect/doi_fsl/fsl/home/
- <https://www.who.int/csr/resources/publications/biosafety/Biosafety7.pdf>
- <http://dbtindia.gov.in/guidelines-biosafety>

SKILL BASED ELECTIVE-I (A)
INFORMATION IN OMICS AND APPLICATIONS

Semester – IV	INFORMATION IN OMICS AND APPLICATIONS	Hours/Week – 2	
Skill based Elective-I (A)		Credits – 2	
Course Code - 19UBT4SBE1A		Internal 25	External 75

Objectives

- To understand the basic Principles and techniques of OMICS
- To familiarize with the basic tools and techniques employed in OMICS
- To grow knowledge regarding the modern application of molecular tools in real life problems
- To apply knowledge of different omics technology for designing experiment

Course Outcomes

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge level
CO1	Develop knowledge on the basics of omics and their versatile applications	K1
CO2	Understand the omics data analysis	K2
CO3	Integration of omics approaches for improvement of life	K2
CO4	Technical skills and knowledge development on versatile techniques in omics	K3
CO5	Explore more advanced application based aspects in omics	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	M	S	M
CO2	L	M	M	M
CO3	S	M	S	M
CO4	S	S	S	M
CO5	S	S	M	M

S – Strong, M – Medium, L – Low

SKILL BASED ELECTIVE-I (A)
INFORMATION IN OMICS AND APPLICATIONS

Unit I **6 Hours**

Overview and general principles of omics technologies in biotechnology. The data analysis workflow- from quantitative data to biological information.

Unit II **6 Hours**

Omics approaches: Genomics, Proteomics, Transcript omics and Metabolomics. Functional omics for discovery of novel organisms, enzymes, value added products.

Unit III **6 Hours**

Omics tools- DNA sequencing, Genome sequencing, Next generation sequencing methods. Genome annotation, Functional genomics. RNA Sequencing, Microarray.

Unit IV **6 Hours**

Basics concepts, Tools of proteomics- SDS PAGE, 2D PAGE, Liquid chromatography, Mass spectrometry (ESI and MALDI), Protein identification by peptide mass finger printing. Applications of proteomics.

Unit V **6 Hours**

Fundamental concepts and tools of metabolomics. Capillary electrophoresis, Gas chromatography. Application of omics in different field of biotechnology including agriculture, environment, pharmaceuticals, medicine and forensics

Text books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Debmalya Barh Vasco Azevedo	Omics Technologies and Bio-engineering	Academic press	2017
2	Wittmann,c. and Lee,S.Y.eds	Systems metabolic engineering	Springer science and Business Media	2012
3	Barh,D.,Zambare,V. and Azevedo,V.	Omics: applications in biomedical, agriculture and environment	Springer science and Business Media	2017
4	Kihara,D.	Protein function prediction for omics era	Springer science and business Media	2011
5	Debmalya Barth, Vasco Azevedo	Omics Technologies and Bio- Engineering	Academic press	2018

Reference books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Lawrence Baker	Bioinformatics: Tools and Techniques	Callisto Reference	2018
2	Jeremy W Dale, Malcolm van Schantz	From genes to genome	Willey – Blackwell	2011
3	Martins-de-souza,D.	Shotgun Proteomics	Humana Press	2014
4	Michael Agostino	Practical Bioinformatics	Garland Publishing	20013
5	Low, L and Tammi, M	A Practical Handbook of Next Generation Sequencing and Its Applications	World Scientific	2017
6	Mohammed Iftekhar	Bioinformatics Practical Manual	Create Space Independent Publishing Platform	2015

Pedagogy

Powerpoint presentation, Simulation, Animated videos, Lab and industrial visits, Group Discussion, Seminar and Assignment.

Web links

- www.sciencedirect.com
- <https://www.ncbi.nlm.nih.gov/pubmed/>
- <https://nptel.ac.in/courses/102103045/>
- <http://www.nih.gov>
- <http://www.nas.edu>

SKILL BASED ELECTIVE - I (B)

BIOINFORMATICS

Semester – IV	BIOINFORMATICS	Hours/Week – 2	
Skill Based Elective – I (B)		Credits – 2	
Course Code –19UBT4SBE1B		Internal 25	External 75

Objectives

- To get introduced to the basic concepts of Bioinformatics
- To familiarize with the available databases related to bioinformatics
- To learn the usage of basic online bioinformatics tools and techniques
- To apply the concepts and tools of bioinformatics in various fields

Course Outcomes

Upon successful completion of the course, the students will be able to

CO Number	CO Statement	Knowledge level
CO1	Understand the basic concepts and terminologies in bioinformatics	K1
CO2	Learn the basic online biological resources and databases	K2
CO3	Learn and apply the online software and tools for macromolecular structure prediction and sequencing	K2
CO4	Apply the bioinformatics tools in medicine for drug discovery and identification of novel drugs	K3
CO5	Apply the bioinformatics ideas in different fields and explore upcoming areas of interest in bioinformatics	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	L	M	M	S
CO2	M	M	S	M
CO3	S	M	S	M
CO4	S	M	S	M
CO5	S	S	S	M

S – Strong, M – Medium, L - Low

SKILL BASED ELECTIVE - I (B)

BIOINFORMATICS

Unit I

6 Hours

History of Bioinformatics[#] – Introduction to concepts and terminology of Internet, Search Engines, Databases and Softwares

Unit II

6 Hours

Review of basics about structure of macromolecules - DNA, RNA and Proteins. Online resources for Bioinformatics – Biological Databases – NCBI, Genbank, EMBL, Swissprot, PDB. Executing search and retrieval of data. Sequence alignment – Multiple sequence alignment – Pairwise alignment.

Unit III

6 Hours

Bioinformatics in genomics and proteomics – gene sequencing tools traditional methods – Maxam and Gilbert's method, Sanger's sequencing – structure prediction tools – Nucleic acid and protein structure prediction – Gene and protein expression analysis – similarity search databases – FASTA, BLAST. Analysis of Phylogeny - Phylogenetic tree construction. Protein ligand interaction, Ramachandran Plot, PYMOL.

Unit IV

6 Hours

Structure based drug discovery – Molecular docking of novel compounds – SAR and QSAR, Introduction to Simulation softwares in biology – Autodock, ADMET.

Unit V

6 Hours

Applications of Bioinformatics in different fields – Medicine, Agriculture, Environmental monitoring - Emerging areas in bioinformatics[#].

Self Study Topics

Text books

S. No.	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Manoj Kumar	Introduction to Bioinformatics	Notion press	2020

2	Ibrokhim Y. Abdurakhmonov	Bioinformatics: Updated Features and Applications	BoD – Books on Demand	2016
3	Paul M. Selzer, Richard J. Marhöfer, Oliver Koch	Applied Bioinformatics: An Introduction	Springer	2018
4.	Prakash S. Lohar	Bioinformatics	MJP Publisher	2019
5	Noor Ahmad Shaik, Khalid Rehman Hakeem, Babajan Banaganapalli, Ramu Elango	Essentials of Bioinformatics, Volume I: Understanding Bioinformatics: Genes to Proteins	Springer	2019

Reference books

S. No	Name of the Author(s)	Title of the book	Publishers name	Year of publication
1	Shoba Ranganathan, Kenta Nakai, Christian Schonbach	Encyclopedia of Bioinformatics and Computational Biology: ABC of Bioinformatics	Elsevier	2018
2	Hamid R Arabnia, Quoc Nam Tran	Emerging Trends in Computational Biology, Bioinformatics, and Systems Biology: Algorithms and Software Tools (Emerging Trends in Computer Science and Applied Computing)	Morgan Kaufmann, 1 st Edition	2015
3	Asheesh Shanker	Bioinformatics: Sequences, Structures, Phylogeny	Springer	2018
4	Paola Lecca,	Systemic Approaches in Bioinformatics and Computational Systems Biology: Recent Advances	Business Science Reference	2011
5	Arthur Lesk	Introduction to Bioinformatics	Oxford University Press	2019
6	Jamil Momand, Alison McCurdy, Silvia Heubach	Concepts in Bioinformatics and Genomics	Oxford University Press	2016

Pedagogy

PowerPoint presentation, Video lectures, Demonstration and hands on teaching, Group discussion, Seminar and assignment.

Web links

- www.ncbi.nlm.nih.gov
- [genbank https://nptel.ac.in/courses/102106065/](https://nptel.ac.in/courses/102106065/)
- www.ebi.ac.uk training › online › course › bioinformatics-terrified
- www.wwpdb.org
- www.bioinformatics.org

CORE COURSE – V
PLANT BIOTECHNOLOGY

Semester – V	PLANT BIOTECHNOLOGY	Hours/Week – 5	
Core Course – V		Credits – 5	
Course Code – 19UBT5CC5		Internal 25	External 75

Objectives

- To know the basic principles and techniques involved in plant tissue culture.
- To study the importance of plant models.
- To acquire knowledge about the concepts of transformation in Plant Biotechnology.
- To understand the achievements of biotechnology in plant system.

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the plant tissue culture, types and production of triploids.	K1
CO 2	Describe the plant nuclear, mitochondrial and chloroplast genome organization and genomic interactions.	K2
CO 3	Illustrate about the Genetic engineering of plants.	K2
CO 4	Outline the clear and concise idea about Plant products.	K3
CO 5	Obtain Knowledge in role of RFLP in plant breeding.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S- Strong, M- Medium, L-Low

CORE COURSE – V
PLANT BIOTECHNOLOGY

Unit I - Plant Tissue Culture **16 Hours**

Establishment of plant tissue culture: Culture media (types of media), Explant: selection and preparation, Types of culture (Callus, Suspension, Meristem, #Embryo, #Anther and Root). Regeneration of plants (Organogenesis and somatic embryogenesis), Somaclonal variations and applications. Production of triploids (Endosperm culture).

Unit II - Plant Genome Organization **14 Hours**

Genome Organization (*Arabidopsis thaliana*): Nuclear Genome, Chloroplast and its Genome, Mitochondrion and its Genome, Cytoplasmic Male Sterility (CMS), Thermo sensitive genic Male sterility (TGMS), Genomic Interaction – Protoplast isolation, culture and fusion.

Unit III -Transgenic Plants **15 Hours**

Genetic engineering and crop improvement – Transgenic plants: Biotic stress resistance (Insect, Virus, Bacteria). Abiotic stress resistance (Herbicide, Drought). Crop Improvement (Flavr savr tomato, Golden Rice). Advantages and disadvantages of transgenic crops – Biosafety concerns and regulations of transgenic plants, Production of Organic food.

Unit IV - Biofertilizers and Molecular Pharming **18 Hours**

Crop production: Production of biofertilizers (Azolla): Criteria for strain selection, steps for preparing biofertilizers (Seed pelleting, inoculant carriers, quality standards for inoculants), Green manuring.

Transgenic plants as Bioreactors: Medical Pharming – Therapeutic proteins (Serum albumin, Hirudin, Collagen and Somatotrophin), Plantibodies, Edible Vaccines (Potato, Banana, Tomato, Lettuce and Alfalfa). Non medical Pharming – Industrial Enzymes (Cellulase and α -amylase), Bioplastics.

Unit V - Role of Molecular techniques in Plant Breeding **12 Hours**

Markers based on DNA Hybridization (RFLP) –Markers based on PCR amplification (RAPD, AFLP, STS, SNPs and Microsatellites). Genomic enabled breeding methods– Linkage analysis and Quantitative Trait Loci. Biosafety and bioethics in plant breeding.

Self Study

Text Books

S. No	Author	Title	Publisher	Year of Publication
1	Kapor Renu, Ranabhatt Hiru	Plant Biotechnology	Woodhead Publishing, India	2018
2	Neal Stewart Jr	Plant Biotechnology and Genetics : Principles, techniques and applications	John Wiley & Sons, Inc	2016
3	Shaileash Kumar, Sweta Mishra, Mishra A.P.	Plant Tissue Culture: Theory and Techniques	Scientific Publisher	2016
4	Palmiro Paltronieri, Yiguo Hong	Applied Plant Genomics and Biotechnology	Woodhead Publishing, India	2015
5	Muhammad SK, Iqar AK, Debmalya Barh	Applied Molecular Biotechnology. The Next Generation of Genetic Engineering.	CRC Press	2016

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Bishun Deo Prasad, Sangita Sahini, Prashant Kumar, Mohammed Wasin Siddih	Plant Biotechnology Vol I: Principles, Techniques and Applications	Apple Academic Press	2018
2	Abdin MZ, Kiran U, Kamaluddin M, Ali A	Plant Biotechnology: Principles and Applications	Springer, Singapore	2017
3	Bahadur B, Rajam B, Sahijram MV, Krishnamoorthy KV	Plant Biology and Biotechnology	Springer, India	2015
4	Bob B. Buchanan, Wilhelm and Cruissem and Russell L. Jones	Biochemistry and Molecular Biology of Plants	John Wiley and Sons, Ltd	2015
5	Hae Jong Koh and Michael Thomson	Current technologies in Plant Molecular Breeding	Springer	2016

Pedagogy

- Lecture (Chalk and Talk – OHP- LCD)
- Quiz, Seminar, Assignment, Group Discussion,
- Videos and Animations.

Web links

- <https://www.z-lib.org>
- <https://www.pdfdrive.org>
- <https://nptel.ac.in/courses/102/103/102103016/#watch>
- <https://www.dcu.ie>
- <https://www.edx.org>
- <https://unacademy.com>
- <https://www.sciencedirect.com>
- <https://khanacademy.org>

CORE COURSE - VI
ANIMAL BIOTECHNOLOGY

Semester – V	ANIMAL BIOTECHNOLOGY	Hours/Week - 5	
Core Course – VI		Credits - 5	
Course Code - 19UBT5CC6		Internal 25	External 75

Objectives

- To understand the basic requirements and techniques about Animal Cell Culture.
- To provide the knowledge about the manipulation of Embryo.
- To provide basic concepts about Cloning.
- To provide an overview and current developments in different areas of animal biotechnology.

Course outcome

On successful completion of the course, the students will be able to

CO No	CO statement	Knowledge level
CO1	Explain the fundamental scientific principles that underlie cell culture and its importance.	K1
CO2	Acquire knowledge for isolation, maintain and growth of cells.	K2
CO3	Develop techniques for the production of Growth Hormones, monoclonal antibodies etc.	K3
CO4	Explain proficiency in establishing and maintaining of cell lines.	K3
CO5	Analyze principles and applications of animal cloning and gene therapy along with ethical concerns.	K1

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	S	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	M	M	S
CO5	S	S	S	S

S-Strong, M-Medium, L-Low

CORE COURSE - VI
ANIMAL BIOTECHNOLOGY

Unit I - Animal Cell Culture **15 Hours**

Animal cell culture - Introduction and History. Lab Facilities – Infrastructure- Equipment – Culture Vessels. Media Composition – Types – Natural – Synthetic – Semisynthetic – Freezing Media. Reagents – Antibiotics – Trypsin – Indicators.

Unit II - Types of Animal Cell Culture **13 Hours**

Types of Cultures – Primary – Secondary – Established Cultures. Culture – Finite – Continuous Culture - Histotypic – Organotypic. Biology of Cultured Cells – Cell Synchronization – Cell Viability – Cytotoxicity – Cryopreservation.

Unit III - Gene transfer and Reproductive Cloning **17 Hours**

Gene transfer methods in Animals –Physical - Chemical - Biological methods. Biological vectors – Bacteria - Virus. Hybridoma technology. Gametogenesis. Stages of embryonic development – Morula, Blastulation, Gastrulation and Organogenesis. Cryopreservation - Sperm - Ova - Embryo of livestock. Artificial Insemination - Super ovulation - In vitro Fertilization- Culture of Embryos - Embryo transfer- Embryo Splitting- Embryo Sexing.

Unit IV- Transgenesis **15 Hours**

Animal Cloning - Basic Concepts. Cloning from Embryonic Cells - Adult cells. Cloning of different Animals - Transgenic Animals – Mice – Sheep - Fish. Products from Transgenic Animals – Insulin – Growth Hormones – Blood Clotting Factors. Merits - demerits.

Unit V- Gene Therapy **15 Hours**

Gene Therapy - Types of Gene Therapy- Somatic – Germline Gene Therapy. Approaches – Ex vivo – In vivo Gene Therapy. Gene knock out technology. #Global Ethical Challenges in Animal Biotechnology.

Self Study #

Text Books

S. No.	Author	Title	Publisher	Year of Publication
1	Ashish Verma and Anchal Singh	Animal Biotechnology – Models in Discovery and Translation 2 nd Edition	Elsevier, India	2020
2	Birbal Singh Gorakh Mal Sanjeev K. Gautam Manishi Mukesh	Advances in Animal Biotechnology	Springer, Switzerland	2019
3	Daniel Scherman	Advanced Textbook On Gene Transfer, Gene Therapy And Genetic Pharmacology, 2nd Edition	World Scientific Europe Ltd	2019
4	Niemann H and Christine Wrenzycki	Animal Biotechnology 1 – Reproductive Biotechnologies	Springer International Publishing AG, Switzerland	2018
5	Inderbir Singh's	Human Embryology – 11 th Revised Edition	Jaybee Brothers Medical Publishers, India	2017
6	B. Singh and S.K. Gautam	Textbook of Animal Biotechnology	The Energy and Resources Institute, TERI	2013

Reference Books

S. No.	Author	Title	Publisher	Year of Publication
1	U. satyanarayana, U. chakrapani	Biotechnology 12th Edition	Books, India	2019
2	Uma Lakshmi pathy & Bhaskar Thyagarajan	Primary And Stem Cells: Gene Transfer Technologies And Applications	Wiley, New Jersey.	2011
3	Glick, B.R. and Pasternak, J.J.	Molecular biotechnology- Principles and applications of recombinant DNA	ASM press, Washington, USA	2009
4	Myers, R.M., Caudy, A. and Witkowski, J.K.	DNA genes and genomes- A short course	N.Y., USA	2007

Pedagogy

e-content, Lecture, Power Point Presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation.

Web links

- www.whatisbiotechnology.org
- <https://youtu.be/ON2e1VsBhJk>
- <https://youtu.be/UV7T9JsxdXA>
- https://youtu.be/UMdC6m_BxfM

CORE COURSE – VII

BIOSTATISTICS

Semester – V	BIOSTATISTICS	Hours/Week – 5	
Core Course – VII		Credits – 5	
Course Code –19UBT5CC7		Internal 25	External 75

Objectives

- To study the basic concepts of statistics and sampling design
- To equip analytical thinking to solve biological problems

Course Outcome

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Explain the basic concepts of biostatistics, functions and limitations	K3
CO2	Classify the data and sampling design	K3
CO3	Compute the measures of central tendency and measures of Dispersion	K3
CO4	Apply the concepts of skewness, moments, kurtosis, correlation and regression to solve the problems.	K4
CO5	Examine the various testing of hypothesis and also analysis of variance based on one-way classification and two-way classification	K4

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	S	S
CO3	S	S	M	S
CO4	S	S	S	S
CO5	S	S	S	S

S-Strong, M-Medium, L-Low

CORE COURSE – VII

BIOSTATISTICS

Unit I **15 Hours**

Introduction to biostatistics - definition, statistical methods, biological measurement, kind of biological data, functions of statistics and limitation of statistics - Collection of data, sampling and sampling design.

Unit II **15 Hours**

Tabulation and Frequency distribution, types of representations graphic-bar diagrams, pie diagrams and curves

Unit III **15 Hours**

Measures of central tendency- Mean, Median, Mode, Geometric mean, Harmonic mean - Measures of dispersion and variability changes- Mean deviation, standard deviation, coefficient of variation

Unit IV **15 Hours**

Analysis Skewness, Moments and Kurtosis - Meaning - test of skewness, characteristics of dispersion and skewness. Measures of skewness, objectives - Karl Pearson's coefficient of skewness, Bowley's Coefficient of skewness- Correlation and regression

Unit V **15 Hours**

Testing of hypothesis for small samples-Students' T -Test- Chi square test- F-test or Fisher's F test – Analysis of Variance: Introduction – The Technique of Analysis of Variance- One-way Classification – Two-way Classification.

Text Books

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	P.N. Arora and P.K. Malhan	Biostatistics	Himalaya Publishing house	2008
2	Suranjan Saha	Mathematics and Statistics	New Central Book Agency (P) LTD	2009

Reference Books

S. No.	Authors Name	Title of the Book	Publishers Name	Year of Publication
1	R.S.N. Pillai and V.Bagavathi	Statistics Theory and Practice	S.Chand	2016
2	Bernard Rosner	Fundamentals of Biostatistics	Lengage learning	2006
3	Stephen Bernstein & Ruth Bernstein	Elements of Statistics	Tata McGraw – Hill Edition 2005	2005
4	Veer Bala Rastogi	Fundamentals of Biostatistics	Ane Books India	2006
5	Samuel Delvin	Biostatistics	Sarup and Sons	2007
6	John E. Freund	Mathematical Statistics	Pearson Education Asia	2002

Pedagogy

Power Point Presentation, Group Discussion, Seminar, Assignment

Web Links

- https://www.youtube.com/watch?v=_e4mwlqCQrc
- <https://www.youtube.com/watch?v=AdH5vfobH5E>
- <https://www.youtube.com/watch?v=fNLeogEjMmM>
- <https://www.youtube.com/watch?v=0zZYBALbZgg>

CORE PRACTICAL – V
LAB IN PLANT AND ANIMAL BIOTECHNOLOGY

Semester – V	LAB IN PLANT AND ANIMAL BIOTECHNOLOGY	Hours/Week - 4	
Core Practical V		Credits - 4	
Course Code - 19UBT5CC5P		Internal 40	External 60

Objectives

- To get trained in maintaining aseptic conditions in animal cell culture.
- To acquire hands-on training in formulation of specific media.
- To obtain skills pertaining to isolation procedures from plant and animal sources.
- To understand and learn the establishment of animal cell culture experiments.

Course Outcomes

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Establish and maintain aseptic conditions in tissue culture lab	K1
CO2	Demonstrate the method of DNA isolation from various sources and identification in agarose gel electrophoresis.	K2
CO3	Select & formulate media based on requirement of animal cell culture.	K3
CO4	Enumerate the cells using haemocytometer	K3
CO5	Utilize the skills and basic techniques in culturing cells using primary and secondary methods	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	M	S	S

S-Strong, M-Medium, L-Low

CORE PRACTICAL – V
LAB IN PLANT AND ANIMAL BIOTECHNOLOGY

1. Introduction to safety and aseptic maintenance of tissue culture laboratory.
2. Isolation of Plant genomic DNA.
3. Isolation of *Rhizobium* species from root nodules of legumes.
4. Isolation of protoplast from spinach leaves by mechanical and enzymatic methods.
5. Protoplast fusion by using polyethylene glycol.
6. Isolation of VAM fungi from *Canna indica*.
7. Isolation of genomic DNA from animal liver tissue.
8. Quantification of DNA by Spectrophotometric method.
9. Identification of stages during chick embryo development.
10. Assessment of cell viability by cell counting in Haemocytometer.
11. Preparation of animal tissue culture media.
12. Establishment of Primary cell culture *
13. Establishment of Secondary cell culture *
14. Cryopreservation and thawing of cells *
15. Visit to Animal Cell Culture Lab.

* Practical by demonstration only

Reference books:

S. No.	Author	Title	Publisher	Year of Publication
1	R. Ian Freshney and Amanda Capes-Davis	Freshney's Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications	Wiley - Blackwell	2021
2	Cornelia Kasper, Verena Charwat and Antonina Lavrentieva	Cell Culture Technology	Springer	2018
3	Supriya Dash and Swagat Kumar Das H N Thatoi	Practical Biotechnology: Principles and Protocols	I K International Publishing House	2017
4	Ralf Pörtner	Animal Cell Biotechnology: Methods and Protocols (3 rd Edition)	Humana Press	2016
5	R. Ian Freshney	Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications, 7 th Edition	Wiley - Blackwell	2016

MAJOR BASED ELECTIVE – I (A)
PHARMACOGNOSY

Semester – V	PHARMACOGNOSY	Hours/Week – 5	
Major Based Elective – I (A)		Credits – 5	
Course Code – 19UBT5MBE1A		Internal 25	External 75

Objectives

- To know the fundamentals of Pharmacognosy like scope, classification of crude drugs, their identification and evaluation, phytochemicals present in them and their medicinal properties.
- To know the techniques in the cultivation and production of crude drugs
- To analyse the crude drugs, their uses and chemical nature
- To evaluate the techniques for the herbal drugs

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Understand the importance of drugs in the treatment of Diseases	K1
CO 2	Demonstrate the. Physical, Chemical and sensory characters of crude drugs of plant and mineral origin	K2
CO 3	Outline the scope and importance of Ethnomedicine,	K2
CO 4	Design the Drug Preparation Methods from medicinal plants	K3
CO 5	Analyse the effects of drugs in allopathy with traditional systems of Medicine	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	S	S	S

S- Strong, M- Medium, L-Low

MAJOR BASED ELECTIVE – I (A)
PHARMACOGNOSY

Unit I- Introduction to Pharmacognosy **15 hours**

Definition, #History and Scope of Pharmacognosy including indigenous system of medicine - Ayurveda, Siddha, Unani, Yoga, Homeopathy and Naturopathy. Various systems of classification of drugs and natural origin. Adulteration -Types of Adulteration: Intentional and Accidental adulteration. Drug evaluation - Organoleptic evaluation, Anatomical evaluation, Physical evaluation. Chemical evaluation, Biological evaluation, and organoleptic evaluation: significance of pharmacopoeial standards.

Unit II- Classification and Sources of Drugs **15 hours**

Classification of Crude drugs - Unofficial and non-official drugs. Based on Morphology, Taxonomy, Therapeutic application and Chemical Constituents. Alphabetical Classification of Crude drugs, biological Classification of Crude drugs, chemical Classification of Crude drugs, pharmacological Classification of Crude drugs-, taxonomical Classification of Crude drugs, chemo taxonomical Classification of Crude drugs and Serotaxonomical Classification of Crude drugs.

Unit III- Production of Natural drugs **15 hours**

Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects of alkaloids, terpenoids, glycosides, volatile oils and tannins. Steps involved in Crude drug production- Cultivation, collection, Drying, Extraction, Isolation, Bioassaying, Quality control and preparation of crude drugs of natural origin.

Unit IV- Modern pharmacognosy **15 hours**

The development of modern pharmacognosy in organic chemistry - structure prediction using analytic chemistry techniques, including paper, HPTLC and Gas chromatography Mass spectrophotometry for pharmacologically bio-synthesised substances from the plants - Strychnine, Quinine, caffeine, Nicotine and Vinca alkaloids-vincristine and vinblastine

Unit V- Application of Pharmacognosy **15 hours**

Pharmaceutical applications of secondary metabolites like Alkaloids: Vinca, Rauwolfia.. Flavonoids: Lignans, Tea. Triterpenoids: Dioscorea. Volatile oils: Mentha, Clove, Cinnamon, Coriander. Tannins: Catechu, Pterocarpus. Resins: Ginger, Asafoetida, Glycosides: Senna, Aloes, Bitter Almond.

Self Study Topic #

Text Books

S. No.	Author	Title	Publisher	Year of Publication
1	Shagufta Perveen	Pharmacognosy Medicinal plants	eBook (PDF) ISBN:978-1-83880-874-7	2019
2	Mohammed Ali	Text Book of Pharmaceutical Chemistry-I	CBS Publishers & Distributors	2019
3	P Suresh Narayana D.Varalakshmi T.Pullaiiah	Text Book of Pharmacognosy	CBS Publishers and Distributors	2016
4	Pathania JS	Text Book of Pharmacology for Paramedical students	CBS Publishers and Distributors	2020
5	Dr.Kuntal Das	Pharmacognosy and Phytochemistry -II	Nirali Publishers	2019
6	Veronika Butterweck and Robert furst	Planta Medica Journal of Medicinal Plant and Natural Product Research	Thieme.de	2020
7	Government of India	THE AYURVEDIC FORMULARY OF INDIA (PART - 1,2 AND 3)	Hand cover	2011

Reference Books

S. No.	Author	Title	Publisher	Year of Publication
1	J. S. Qadry	Pharmacognosy	CBS Publishers and Distributors	2018
2	Simone Badal McCreath and Rupika Delgoda	Pharmacognosy: Fundamentals, Applications and Strategies	Academic Press	2016
3	M. A. Iyengar and S.G.K. Nayak	Pharmacognosy Lab Manual	Pharma Med press	2018
4	M.S. Krishnamurthy and JV Hebbar	Easy Ayurveda Home Remedies: Based On Authentic, Traditional Ayurveda Practice Paperback – 1 January	Hand Cover	2018
5	Dr.Kuntal Das	Pharmacognosy and Phytochemistry –II	Nirali Publishers	2019

Pedagogy

e-content, Lecture, Powerpoint presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation

Web links

- <https://www.youtube.com/watch?v=MSabeRbI7fA>
- https://www.youtube.com/watch?v=3_wo0H92sOU
- <https://www.hrpatelpharmacy.co.in/pharmacognosy>
- http://www.pharmacognosy.us/wp-content/uploads/ASP_NL_53-1IX2017.pdf

MAJOR BASED ELECTIVE – I (B)**CANCER BIOLOGY**

Semester – V	CANCER BIOLOGY	Hours/Week – 5	
Major Based Elective – I (B)		Credits – 5	
Course Code – 19UBT5MBE1B		Internal 25	External 75

Objectives

- To identify criteria for various staging of cancer.
- To learn the risks of cancer treatment (experimental and non-experimental)
- To prevent the occurrence of cancer and to get awareness about prevalence of cancer
- To Analyze how the stage of cancer impact goals of treatment, prognosis and progression.

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the types of carcinomas.	K1
CO 2	Infer recent incidents and mortality of Global Cancer	K2
CO 3	Outline the clear and concise idea about Lifestyle& Dietary factors causing cancer.	K2
CO 4	Apply concepts of prevention of cancer, cancer-related deaths and cancer-related disabilities	K3
CO 5	Analyse the molecular mechanisms of cancer establishment and its progression by the process of metastasis and Angiogenesis	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	S	S	S

S- Strong, M- Medium, L-Low

MAJOR BASED ELECTIVE – I (B)

CANCER BIOLOGY

Unit I- Introduction to Cancer

15 hours

Historical and Basic Aspects of Cancer. Hallmarks of cancer. Biological properties of normal and cancer cells. Cancer - Benign and Malignant neoplasms. Types of cancer- Carcinoma, Sarcoma, Leukemia, Lymphoma and myeloma Global Cancer incidents and mortality#. Epidemiology studies.

Unit II- Causative Agents of Cancer

15 hours

Biology - Genetic Factor, Viruses, Hormones. Lifestyle and Dietary factors - Tobacco, Alcohol and Cigarette. Environmental and occupational Exposure - Chemical carcinogens and Mutagens.

Unit III- Biology of Cancer Cells

15 hours

Cell Cycle Regulation in Cancer Cell. Cyclin Dependent Protein Kinase, CDK inhibitors. Apoptosis. Molecular Mechanism-Intrinsic and Extrinsic pathway. Oncogene and Tumor suppressor gene-p53. Metastasis and Angiogenesis.

Unit IV- Cancer Diagnosis

15 hours

Clinical Examination-Biopsy, Blood Test, Bone marrow Aspiration, Pap Test. Imaging-X- ray, CT-Scan, MRI Scan, Endoscopy and Mammography

Unit V- Prevention and Treatment

15 hours

Dietary Supplements- Retinoid, Carotenoids, Vitamin D, Soy Products, Lifestyle Practices- Yoga and Exercise. Treatment- Chemotherapy, Radiotherapy, Immunotherapy, Gene therapy, Stem Cell Therapy and Surgery.

Self Study Topic#

Text Books

S. No	Author name	Title of the book	Publishers name	Year of Publication
1	Gibbons J P	Khans the Physics of Radiation Therapy with Access Code 6ed (HB 2020)	LWW US Reprint	2020

2	Edward Chu , Vincent T. Devita Jr.	Physicians' Cancer Chemotherapy Drug Manual 2019	Jones and Bartlett Publishers, Inc; 19th edition	2018
3	Philip J. DiSaia MD William T. Creasman MD, Robert S Mannel MD	Clinical Gynecologic Oncology	Elsevier; 9th edition	2017
4	Clifford L. K. Pang	Hyperthermia in Oncology, 1st Edition	CRC Press	2015
5	Robert E. Bristow, BethY. Karlan, Dennis S. Chi	Surgery for Ovarian Cancer, 3rd Edition	CRC Press	2015

Reference Books

S.No	Author name	Title of the book	Publishers name	Year of Publication
1	Paul Scotting	Cancer: A Beginner's Guide	Beginner's Guides	2017
2	Klein smith	Principles of Cancer Biology	UBS Publishers	2016
3	Martha Robles-Flores	Cancer Cell Signaling: Methods and Protocols (Methods in Molecular Biology (1165)	Humana; Softcover reprint of the original 2nded. 2014 edition	2016
4	Sayan Paul	The Bethesda Handbook of Clinical Oncology	Wolters Kluwer India Pvt. Ltd.	2020
5	Devita V. T.	Evita hellman and Rosenbergs cancer principles and Practice of oncology 11ED (HB 2019)	LWW; 11 th edition	2019

Pedagogy

e-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation

Web links

- <https://nptel.ac.in/courses/108/108/108108124/>
- <https://www.youtube.com/watch?v=46Xh7OFkkCE>
- https://www.youtube.com/watch?v=U5vAO_f2LDQ
- <https://www.biologydiscussion.com/cancer/study-notes-on-cancer/27314>

SKILL BASED ELECTIVE – II (A)
MOLECULAR DIAGNOSTICS AND THERAPEUTICS

Semester – V	MOLECULAR DIAGNOSTICS AND THERAPEUTICS	Hours/Week – 2	
Skill Based Elective – II (A)		Credits – 2	
Course Code – 19UBT5SBE2A		Internal 25	External 75

Objectives

- To know the basic concepts underlying in the pathogenesis of human diseases.
- To study the different techniques involved in the diagnosis of diseases.
- To understand the principle of therapeutics for the betterment of healthcare

Course Outcome

On the successful completion of the course, students will be able to:

CO No.	CO Statement	Knowledge Level
CO1	Define the principle behind various types of human Diseases	K1
CO2	Outline the molecular markers and its sources	K2
CO3	Explain the molecular techniques involved in the disease diagnosis.	K2
CO4	Apply the approaches pertaining to the treatment of disease.	K3
CO5	Identify recombinant products that are made with the help of cell machinery.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	L	L	L	M
CO2	L	M	M	S
CO3	L	M	M	M
CO4	L	M	M	M
CO5	S	S	M	M

S-Strong, M-Medium, L-Low

SKILL BASED ELECTIVE – II (A)
MOLECULAR DIAGNOSTICS AND THERAPEUTICS

Unit I - Overview of Human Diseases **6 Hours**

Types of Human Diseases: Microbial infections – Bacterial (Cholera and Tuberculosis), Viral (Chicken Pox and HIV) and fungal (Ringworm and Athletes foot), Genetic disease (Sickle cell anemia), Physiological disease (Diabetes), Immune system malfunction and disease (SCID & Rheumatoid arthritis).

Unit II - Biomarkers **6 Hours**

Biomarkers – Definition and Types. Biomarkers in disease diagnosis - Sweat chloride in Cystic Fibrosis, Blood Sugar or HbA1c in Type 2 Diabetes. Serum Creatinine in Kidney Disease, Bilirubin and Alkaline phosphate in Liver Disease, Cardiac troponin in Myocardial infarction and Bronchoalveolar lavage fluid containing C-peptide and Cytokeratin in Pulmonary fibrosis.

Unit III - Techniques in Molecular diagnostics **6 Hours**

Techniques in Molecular diagnostics – Random Amplified Polymorphic DNA (RAPD), Restriction Fragment Length Polymorphism (RFLP), Simple Sequence Repeats (SSR), Fluorescence *In situ* Hybridization (FISH), DNA Microarray, Metagenomics, Amniocentesis.

Unit IV- Introduction to therapeutics **6 Hours**

Introduction to therapeutics, Pharmacodynamics, Pharmacokinetics, Development of drug resistance. Cell based and Recombinant DNA therapies – Gene therapy and Stem cell therapy.

Unit V - Recombinant Products **6 Hours**

Applications of Recombinant products – Insulin[#], DNA Polymerase, Tissue Plasminogen Activator, Interferons, Erythropoietin, DNase I.

Self Study Topic[#]

Text Books

S. No	Author	Title	Publisher	Year of Publication
1	Nader Rifai, Andrea Rita Horvath & Carl T. Wittwer	Tietz Fundamentals of Clinical Chemistry and Molecular Diagnostics	Elsevier	2019
2	Barbara G Wells, Terry L Schwinghammer, Joseph T. DiPiro and Cecily V. DiPiro	Pharmacotherapy Handbook	Mc Graw Hill	2017
3	William B. Coleman, Gregory J. Tsongalis	Diagnostic Molecular Pathology: A Guide to Applied Molecular Testing	Academic Press	2016
4	Lela Buckingham	Molecular Diagnostics Fundamentals, Methods, and Clinical Applications – 2 nd Edition	E.A.Davis Company, Philadelphia	2012
5	Roger Walker and Cate Whittlesea	Clinical Pharmacy and Therapeutics - Fifth Edition	Elsevier	2012

Reference Books

S. No.	Author	Title	Publisher	Year of Publication
1	R S Satoskar, Nirmala N. Rege, Raakhi K. Tripathi and Sandhya K. Kamat	Pharmacology and Pharmacotherapeutics, 26 th Edition	Elsevier	2020
2	Arthur P. Bollon	Recombinant DNA Products	CRC Press	2018
3	Chao-Min Cheng, Chen-Meng Kuan and Chien-Fu Chen	In-Vitro Diagnostic Devices: Introduction to Current Point-of-Care Diagnostic devices	Springer	2016
4	Dr Jayanti Tokas	Immunology and Molecular Diagnostics	University Science Press	2015
5	Harald Seitz, Sarah Schumacher	Molecular Diagnostics (Advances in Biochemical Engineering/ Biotechnology Book 133)	Springer	2013

Pedagogy

Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion, Video/Animation

Web links

- <https://www.cdc.gov/labquality/molecular-methods.html>
- <https://wyss.harvard.edu/keywords/Diagnostics/?section=technology>
- <https://nptel.ac.in/content/storage2/courses/102103013/pdf/mod3.pdf>

SKILL BASED ELECTIVE – II (B)**LAB IN BIOINFORMATICS**

Semester – V	LAB IN BIOINFORMATICS	Hours/Week - 2	
Skill Based Elective – II (B)		Credits – 2	
Course Code - 19UBT5SBE2BP		Internal 40	External 60

Objectives

- To learn and execute various molecular analysis using bioinformatics tools.

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate nucleotide analysis from various databases	K1
CO 2	Analyze the structure of novel proteins	K2
CO 3	Perform basic phylogenetic analysis for species identification	K2
CO 4	Apply the sequencing skills in various molecular analysis	K3
CO 5	Identify and analyze any disorders in a genome sequence	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	M	M	S	S

S-Strong, M-Medium, L-Low

SKILL BASED ELECTIVE – II (B)

LAB IN BIOINFORMATICS

1. Retrieval of Nucleotide Sequence from GenBank, EMBL, DDBJ database.
2. Retrieval of Protein Sequences from PIR, Swissprot/ Uniprot database.
3. Protein Structure database –PDB.
4. Motif and domain analysis using HOMER Motif database.
5. Pairwise Sequence analysis using BLAST.
6. Multiple Sequence analysis using ClustalW.
7. Construction of Phylogenetic tree.
8. Molecular visualization using Rasmol.
9. Pathway search using KEGG database.
10. Retrieval of Disease/ disorder genome sequence from OMIM database.
11. Homology Modeling using SWISS – MODEL Workspace.

Reference books

S. No.	Author	Title	Publisher	Year of Publication
1	Dr. Shashank Rana, Dr. Vartika Singh, Preeti Kashyap, Bhavya Sharma, Shilpi Tiwari	Bioinformatics Practical Manual	Manojvm Publishing House	2020
2	Lloyd Wai Yee Low, Martti Tapani Tammi	Bioinformatics: A Practical Handbook Of Next Generation Sequencing And Its Applications	World Scientific Publishing Company	2017
3	Noor Ahmad Shaik, Babajan Banaganapalli, Ramu Elango, Khalid Rehman Hakeem	Essentials of Bioinformatics, Understanding Bioinformatics: Genes to Proteins	Springer International Publishing	2019
4	Mohammad Yaseen Sofi, Afshana Shafi, Khalid Z. Masoodi	Bioinformatics for Everyone	Elsevier Science	2021
5	Kenta Nakai, Christian Schonbach	Encyclopedia of Bioinformatics and Computational Biology ABC of Bioinformatics	Elsevier Science	2018

Semester – V	DNA FINGERPRINTING	Hours/Week – 2	
Skill Based Elective – III (A)		Credits – 2	
Course Code - 19UBT5SBE3A		Internal 25	External 75

Objectives

- To understand the basic concepts in DNA profiling
- To familiarise with analytical tools and sample preparation methods for DNA testing
- To apply the DNA fingerprinting technique to solve various research and real life problems

Course Outcomes

On the Successful completion of the course the students would be able to

CO No.	CO Statement	Knowledge Level
CO1	Understand the basis of DNA fingerprinting	K1
CO2	Demonstrate the sample preparation and processing from various specimens	K2
CO3	Familiarise with the available analytical tools and techniques for DNA fingerprinting	K2
CO4	Analyse various case studies based on DNA fingerprinting	K3
CO5	Apply the knowledge in various problem solving aspects	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	L	M	S
CO2	S	S	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	M	S	S

S-Strong, M-Medium, L-Low

Unit I- Introduction to DNA fingerprinting**4 Hours**

Introduction and history of DNA Fingerprinting –Discovery and advancements, Basis of molecular genetics – Organization of human genome, Pedigree analysis, DNA Polymorphisms.

Unit II- Sample preparation for DNA fingerprinting**8 Hours**

Sample preparation techniques – extraction of DNA sample from various sources, isolation and quantification of DNA, Purity analysis of DNA and sample processing. Primer designing and applications. Application of PCR technology in Forensic DNA profiling. Amplification of variable regions using PCR Agarose gel Electrophoresis for amplified products.

Unit III- Analytical tools**6 Hours**

Analytical tools for studying DNA polymorphism –PCR amplifications; Single nucleotide polymorphism (SNuPs); Genetic linkage mapping; Physical mapping of the genome.

Unit IV- Applications of DNA fingerprinting**6 Hours**

Applications of DNA fingerprinting in genome research, medicine – diagnosis and drug development, forensic investigation – identification of suspects, kinship analysis, Agriculture – Plant varieties protection.

Unit V- Case studies**6 Hours**

Case study based on DNA fingerprinting[#]– Disputed property, paternity, criminal identification.

Self study Topic[#]**Text Books**

S. No.	Author	Title	Publisher	Year of Publication
1	Jeremey W. Dale and Malcom von Schantz	From genes to genomes: Concepts and applications of DNA Technology	Wiley	2002
2	MunisDundar	Current Applications of Biotechnology	European Biotechnology Thematic Network Association	2015

3	T. A. Brown	Gene Cloning and DNA Analysis: An Introduction.7 th Edition	Wiley Blackwell	2016
4	Hoffman A	Wilson and Walkers Principles and Techniques of Biochemistry and Molecular Biology	Cambridge University Press	2018
5	Sue Carson Heather Miller Melissa Srougi D. Scott Witherow	Molecular Biology Techniques A Classroom Laboratory Manual, 4 th Edition	Academic Press	2019

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Hirakranjan Dash, Pankaj Shrivastava, Braja Kishore Mohapatra and Surajit das	DNA Fingerprinting: Advancements and endeavours	Springer	2018
2	Bernard R. Glick and Cheryl L. Patten	Molecular Biotechnology: Principles and Applications of Recombinant DNA. 5 th Edition	ASM Press, Washington DC	2017
3	Nessacarey	Junk DNA: A Journey through the Dark Matter of the Genome	Columbia University Press	2017
4	Jo – Anne Bright and Michael Coble	Forensic DNA Profiling: A practical guide to assigning likelihood Ratios	CRC Press	2019
5	Pankaj Shrivastava, HirakRanjann Dash,	Forensic DNA typing: Principles, Applications and Advancements	Springer	2020

Pedagogy

Power point presentation, Group Discussion, Case study analysis, Seminar, Assignment, Animations and virtual lab.

Web Links

- <https://www.genome.gov/genetics-glossary/DNA-Fingerprinting#:~:text=DNA%20fingerprinting%20is%20a%20laboratory,evidence%20came%20from%20that%20suspect.>
- <https://nptel.ac.in/courses/102/103/102103017/>
- <https://www.youtube.com/watch?v=AkBUriMK9u8>
- <https://www.nature.com/scitable/topicpage/forensics-dna-fingerprinting-and-codis-736/>
- <https://jolt.law.harvard.edu/assets/articlePDFs/v03/03HarvJLTech223.pdf>

Semester – V	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS/WEEK	CREDITS
21UBT5SBE3BP	LAB IN PLANT TISSUE CULTURE & ENVIRONMENTAL BIOTECHNOLOGY	SKILL BASED ELECTIVE	2	2

Course Objective

- To acquire hands-on training in maintaining aseptic conditions and formulation of specific media required for plant tissue culture.
- To acquire skills in handling different explants for plant tissue culture experiments.
- To get hands on training in isolation of industrial important microbes and production of various products such as azolla, mushroom, vermicompost and enzyme.
- To understand and learn the concepts of Water quality analysis techniques.

Course Outcome and Cognitive Level Mapping

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Cognitive Level
CO1	Design and maintain aseptic environment and formulate required media and stock solutions based on requirement	K1
CO2	Demonstrate the methods of preparing explant	K2
CO3	Handle and establish various explants and induce direct and indirect organogenesis.	K2
CO4	Isolate and culture the industrially important microorganisms, mushroom, vermiculture and product production	K3
CO5	Analyse the physical and chemical parameters of water sample	K4

Mapping of CO with PO and PSO

Cos	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	M	M	L
CO3	M	M	M	M
CO4	S	S	S	M
CO5	S	S	S	M

S-Strong, M-Medium, L-Low

SKILL BASED ELECTIVE III (B)

LAB IN PLANT TISSUE CULTURE & ENVIRONMENTAL BIOTECHNOLOGY

1. Media preparation and Sterilization techniques
2. Surface sterilization of Explants
3. Inducing direct organogenesis and plant regeneration
4. Inducing indirect organogenesis and plant regeneration
5. Protoplast Culture.
6. Cultivation of Azolla
7. Process of Mushroom Cultivation
8. Process of Vermicomposting
9. Isolation of industrially important microorganisms from soil.
10. Degradation of the organic wastes using the isolated soil microbes and enzymes.
11. Determination of Total alkalinity of water sample
12. Determination of the Acidity of the given water
12. Determination of Biological Oxygen demand of water sample
14. Determination of Chemical Oxygen demand of water sample
15. Bacteriological analysis – Estimation of coliforms in the given sample

Reference Books

S. No.	Author name	Title of the book	Publishers name	Year of publication
1.	Kibebew Aberra, Birhanu Nigus	Plant Cell Tissue and Organ Culture - A laboratory Manual.	LAP Lambert Academic Publishing	2021
2.	Jayanta Kumar Patra, Gitishree Das	A Practical Guide to Environmental Biotechnology (Learning Materials in Biosciences) First edition	Springer	2020
3.	Ratna Trivedi	Practical Manual of Environmental, Microbiology and Biotechnology	SSDN Publishers & Distributors	2020
4.	Karl-Hermann Neumann, Ashwani Kumar, Jafargholi Iman	Plant Cell and Tissue Culture – A Tool in Biotechnology: Basics and Application	Springer	2020
5.	Razdan M K	Introduction To Plant Tissue Culture 3Ed	Oxford & Ibh Publishing	2019

E-Books

- <https://www.pdfdrive.com/plant-tissue-culture-theory-and-practice-a-revised-edition-e156774276.html>
- <https://www.pdfdrive.com/plant-tissue-culture-third-edition-techniques-and-experiments-e189228999.html>
- <https://www.pdfdrive.com/plant-tissue-culture-e33292831.html>
- <https://www.pdfdrive.com/environmental-microbiology-a-laboratory-manual-e184055362.html>
- <https://www.pdfdrive.com/water-quality-procedures-and-practices-manual-e49686765.html>

Web links

- <https://vlab.amrita.edu/?sub=3&brch=187&sim=1100&cnt=1>
- <https://www.youtube.com/watch?v=CuJavQyTsrM>
- <https://www.youtube.com/watch?v=TORRxwbz7aY>
- <https://www.vlab.co.in/broad-area-biotechnology-and-biomedical-engineering>
- [http://icv-au.vlabs.ac.in/inorganic-chemistry/Water Analysis Determination of Physical Parameters/](http://icv-au.vlabs.ac.in/inorganic-chemistry/Water%20Analysis%20Determination%20of%20Physical%20Parameters/)

Pedagogy

Practical Observation and Demo

Course Designer

1. **Dr. M. KEERTHIGA**

PROFESSIONAL SKILLS

Semester – V	PROFESSIONAL SKILLS	Hours/Week – 2	
UGC Jeevan Kaushal Life Skills		Credits – 2	
Course Code - 19UGPS		Internal 25	External 75

Objectives:

- To prepare students to become viable entrepreneurs or employees with necessary professional skills.
- To enhance the comprehensive skills required for a work environment leading them competent and confident.

Prerequisite:

An open minded and assertive attitude to acquire the salient skills for a prospective career.

Course Outcomes

On the successful completion of this course the students will be able to

CO NUMBER	CO STATEMENT	KNOWLEDGE LEVEL
CO1	Identify and define professional communication skills and effective interaction.	K1
CO2	Examine and reproduce LSRW skills in professional development.	K2
CO3	Explain and express views and opinions in an assertive manner.	K2
CO4	Prepare and practise to communicate through digital mode.	K3
CO5	Employ and transfer the acquired skills in a practical approach	K3

Mapping with Programme Outcome

COS	PO1	PO2	PO3	PO4	PO5
CO1	S	S	L	L	S
CO2	S	S	L	M	S
CO3	S	S	M	M	S
CO4	S	L	L	M	S
CO5	S	S	L	S	S

S- Strong M-Medium L-Low

PROFESSIONAL SKILLS

Unit I - Resume Skills 5 Hours

- Preparation and Presentation.
- Avoiding Common Errors.
- Preparing Resumes for Specific Purposes.

Unit II- Interview Skills 8 Hours

- Useful Vocabulary
- Preparation and Presentation.
- Dos and Donts
- Observation of a Simulated Interview.

Unit III - Body Language and Personal Grooming 5 Hours

- Importance of Body Language (Postures, Eye Contact, Expressions and Etiquettes)
- Good Grooming is Being Clean

Unit IV- Social and Cultural Etiquettes 6 Hours

- Good Manners and Etiquettes
- Table Manners
- Manners in Public

Unit V- Group Discussion Skills 6 Hours

- Meaning and Methods of Group Discussion.
- Procedure of Group Discussion.
- Group discussion – Simulation.
- Common Errors – How to Avoid It

Pedagogy

Seminar, Simulation, Quiz and Assignment

Material for Teaching and Reference

- https://graphicdesign.sfcc.spokane.edu/dZine/projects/Q3typographic_resume/resume
<http://worldwideuniversity.org/library/bookboon/the-art-of-interview-skills.pdf>
- https://www.tutorialspoint.com/positive_body_language/positive_body_language_tutorial.pdf
- <https://oaktrust.library.tamu.edu/bitstream/handle/1969.1/160849/254/MP0254.pdf?sequence=8&isAllowed=y>
- http://www.edudel.nic.in/welcome_folder/after12th/enrich_dt_11112014.pdf
- <http://egyankosh.ac.in/bitstream/123456789/35846/5/Unit-10.pdf>

CORE COURSE – VIII
MICROBIAL BIOTECHNOLOGY

Semester – VI	MICROBIAL BIOTECHNOLOGY	Hours/Week- 6	
Core Course – VIII		Credits – 6	
Course Code – 19UBT6CC8		Internal 25	External 75

Objectives

- To know the industrially important microbes and their metabolic pathways.
- To study the microbial fermentation processes and its types.
- To acquire knowledge about the types of bioreactors and recovery of fermentation product.
- To provide the knowledge about the industrially important products.

Course outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the isolation of industrially important microorganisms and their preservation	K1
CO 2	Outline a clear and concise idea about concepts and basic methods in fermentation process	K2
CO 3	Discuss the design and types of bioreactor and upstream processing	K3
CO 4	Illustrate the various methods of bioseparation	K4
CO 5	Obtain knowledge in applications of microbes in food processing and production	K5

Mapping with Programme outcomes

CO	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S- Strong, M-Medium, L-Low

CORE COURSE – VIII
MICROBIAL BIOTECHNOLOGY

Unit I - Basic principles of Biochemical Engineering **16 Hours**

Introduction and historical developments in industrial microbiology, industrially important microbes and metabolic pathways- various microbial metabolites and their overproduction – Isolation and selection of industrially important microorganisms preservation and maintenance of microbial culture.

Unit II - Concepts of basic mode of fermentation processes **16 Hours**

Microbial substrates and media formulation; Components of microbial fermentation process; Types of fermentation processes- Solid state, static and submerged fermentation. Fermentation economics and fermentation media. Fermenter design - mechanically agitated, pneumatic and hydrodynamic fermenters. Design of laboratory bioreactor; Types of Bioreactor: Continuous, semi continuous and fed batch bioreactors; Continuous Stirred tank bioreactors, Bubble column bioreactors, Air lift bioreactors, Fluidized bed bioreactors, Packed bed bioreactors and Photobioreactors.

Unit III - Upstream Processing **16 Hours**

Bioprocessing: Culture collections, Industrial strains and strain improvement: Natural recombination, conjugation, Mutagenesis, Genetic engineering of Microorganisms, Strain stability. Media formulation, sterilization, aeration and agitation. Large scale animal and plant cell cultivation and air sterilization. Measurement and control of bioprocess parameters, scale up and scale down process.

Unit IV - Downstream processing **16 Hours**

Bioseparation - filtration, centrifugation, sedimentation, flocculation, microfiltration, sonication. Cell disruption – enzymatic lysis and liquid-liquid extraction. Purification by precipitation (ammonium sulfate, solvent), electrophoresis and crystallization. Extraction (solvent, aqueous two phase, super critical) and chromatographic techniques (Ion exchange chromatography, hydrophobic interaction chromatography, affinity chromatography and gel filtration chromatography. Reverse osmosis and ultra filtration. Drying, crystallization, storage and packaging.

Unit V- Applications of Microbes in food processing and production**16 Hours**

Production of Microbial Biomass – Baker’s Yeast, Mushroom; Production of antibiotic; Penicillin and Streptomycin - Production of fermented foods; Alcoholic beverages - wine, beer. Production of ethanol[#], citric acid, amino acids and vitamins- Microbial enzymes for food – Biopesticides and biofertilizers.

- Self Study Topics**Text Books**

S.No.	Author	Title of the book	Publishers	Year of publication
1	Joginder Singh, Ashish Vyas, Shanquanwang, Ram Prasad	Microbial Biotechnology: Basic Research and Applications	Springer Nature Singapore pvt.Ltd	2020
2	Jayanta Kumar Patra, Gitishree Das, Han-SeungShin	Microbial Biotechnology Application in Food and Pharmacology	Springer Nature Singapore pvt.Ltd	2018
3	Pradeep Kumar, Jayanta Kumar Patra, Pranjali Chandra	Advances in Microbial Biotechnology Current Trends and Future Prospects	Apple Academic Press	2019
4	Rita Kundu , Rajiv Narula	Advances in Plant and Microbial Biotechnology	Springer Nature Singapore pvt.Ltd	2019
5	Dr.R.C.Dubey	A Textbook of Biotechnology	Schand Publishing	5 th Revised Edition,2014

Reference Books

S.No.	Author	Title of the book	Publishers	Year of publication
1	Lee Yuan kun	Microbial Biotechnology Principles and Applications	e- Book	Third Edition,2019
2	Bernard R.Glick, Jack J.Pasternak	Molecular Biotechnology Principles and Applications of Recombinant DNA	Wiley Publication	2017
3	P.Singh	Recent Trends in Microbial Biotechnology	CBS Publication	2013

4	Debabrata Das, SoumyaPandit	Industrial Biotechnology	CRC Press	2021
5	WimSoetaert, Erick J. Vandamme	Industrial Biotechnology: Sustainable Growth and Economic Success	Wiley VCH Publication	1st Edition,2019

Pedagogy

- Lecture (Chalk and Talk – OHP, LCD)
- Quiz, Seminar, Assignment, Group Discussion
- Videos and Animations

Web links

- <https://www.z-lib.org>
- <https://www.pdfdirve.org>
- <https://www.dcu.ie>
- <https://www.edx.org>
- <https://unacademy.com>
- <https://www.sciencedirect.com>
- <https://khanacademy.org>

CORE COURSE – IX
IPR, BIOETHICS AND BIOSAFETY

Semester – VI	IPR, BIOETHICS AND BIOSAFETY	Hours/Week – 6	
Core Course – IX		Credits – 6	
Course Code – 19UBT6CC9		Internal 25	External 75

Objectives

- To understand various aspects of IPR, biosafety regulations and bioethics concerns arising from the commercialization of biotech products.
- To give an idea about IPR, registration and its enforcement.
- To sensitize about the importance of Personnel Protective Equipment (PPE), general biosafety rules and different biosafety levels.

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Define the fundamental aspects of Intellectual Property Rights for development and management of innovative projects in industries	K1
CO 2	Outline the current trends in IPR and Govt. steps in fostering IPR	K2
CO 3	Explain about the ethical issues involving biological material.	K3
CO 4	Utilize adequate knowledge in the use of genetically modified organisms and its effect on human health	K3
CO 5	Make use of critical thinking skills to analyze information and situations in order to respond and act ethically with regard to scientific research, practice, and technology.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S- Strong, M- Medium, L-Low

CORE COURSE – IX
IPR, BIOETHICS AND BIOSAFETY

Unit I- Introduction to Intellectual Property and Types of IPs **18 Hours**

Introduction to IPR, Basic concepts and need for Intellectual Property, types - Patents, Trademarks, Trade Secrete, Copyright, Geographical Indications- History of GATT and TRIPS Agreement. – World Intellectual Property Rights Organization (WIPO). IP rights in India and abroad (USA & Europe) - few Case Studies-patent-Turmeric Patent,GI- Darjeeling Tea.

Unit II - Patent Filing Procedures and Agreements **18 Hours**

Patent- Elements of Patentability: Novelty, Non Obviousness (Inventive Steps), patentable and non-patentable – patenting life, Registration Procedure, Rights and Duties of Patentee, Assignment and license, Patent infringement. IPR Agreements and Treaties: Madrid Agreement; Hague Agreement; Budapest Treaty; PCT; Indian Patent Act 1970.

Unit III - Biosafety **18 Hours**

Introduction, biosafety issues in biotechnology - historical background; Introduction to Biological Safety Cabinets; Primary Containment for Biohazards; #Biosafety Levels; Biosafety Levels of Specific Microorganisms; Recommended Biosafety Levels for Infectious Agents and Infected Animals.

Unit IV- Biosafety Guidelines **18 Hours**

Biosafety guidelines and regulations (National and International) – operation of biosafety guidelines and regulations of Government of India; #Definition of GMOs and LMOs; Roles of Institutional Biosafety Committee, RCGM, GEAC, for GMO applications in food and agriculture; Environmental release of GMOs; Risk Analysis; Risk Assessment; Risk management and communication; Overview of National Regulations and relevant International Agreements including Cartagena Protocol.

Unit V- Bioethics **18 Hours**

Introduction to ethics/ bioethics – purpose and principles of bioethics, Bioethics in medical – human cloning, Biotechnology and ethics, Benefits and risks of genetic engineering- ethical aspects of genetic testing – ethical aspects relating to use of genetic information – genetic engineering and bio warfare; Ethical implications of cloning: Reproductive cloning, therapeutic cloning; Ethical, legal and socioeconomic aspects of gene therapy, germ line,

somatic, embryonic and adult stem cell research-GM crops and GMO's – biotechnology and biopiracy –ICMR Guidelines- Ethical implications of human genome project.

#- Self Study Topics

Text Books

S. No.	Author	Title	Publisher	Year of Publication
1	Tom Koch	Ethics in Everyday Places	Esri Press	2017
2	Nithyananda, K V.	Intellectual Property Rights: Protection and Management	Cengage Learning India Private Limited	2019
3	AdarshRamanujan	Patent Law Cases and Materials: A Synthesis For India	Wolters Kluwer India Pvt. Ltd	2020
4	Andrew F. Roberts, JoergRomeis, Karen Hokanson, Reynaldo Ariel Alvarez Morales	Biosafety of Genetically Modified Organisms, Volume II	Frontiers Media SA	2020
5	V. ScopleVinod	Managing Intellectual Property	Prentice Hall of India pvt Ltd	2012

Reference Books

S. No.	Author	Title	Publisher	Year of Publication
1	Anil Kumar H S and B. Ramakrishna	Fundamentals of Intellectual Property Rights	Notion Press	2017
2	Dr. S.V. Damodar Reddy	Intellectual Property Rights -- Law and Practice	ASIA LAW HOUSE	2019
3	Dawn P. Wooley and Karen B. Byers	Biological Safety: Principles and Practices	ASM Press; 5th edition	2017
4	Ahuja, V K.	Law relating to Intellectual Property Rights	Lexis Nexis	2017
5	Ramakrishna B & Anil Kumar H.S	Fundamentals of Intellectual Property Rights: For Students, Industrialist and Patent Lawyers	Notion Press	2017

Pedagogy

- Lecture (Chalk and Talk) & Power Point Presentation
- Quiz, Seminar, Assignment & Group Discussion.
- Videos and Animations

Web links

- <http://www.cbd.int/biosafety/backgrounds.html>
- <http://web.princeton.edu/sites/ehs/biosafety/biosafetypage/section>
- <http://www.cbd.int/biosafety/background.shtml>
- [http://web.princeton.edu/sites/ehs/biosafety/biosafetypage/section 3.html](http://web.princeton.edu/sites/ehs/biosafety/biosafetypage/section3.html)
- <http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf>
- <https://www.wipo.int/about-ip/en/>

CORE PRACTICAL – VI
LAB IN MICROBIAL BIOTECHNOLOGY

Semester – VI	LAB IN MICROBIAL BIOTECHNOLOGY	Hours/Week - 5	
Core Practical – VI		Credits – 4	
Course Code - 19UBT6CC6P		Internal 40	External 60

Objectives

- To equip the students with skills pertaining to immobilization and genetic engineering techniques.
- To acquire hands-on exposure to fermentation techniques.
- To get skilled in the production techniques of Single Cell Protein, Biofertilizer and Bio- Enzymes.

Course Outcomes

On the Successful completion of the course the student would be able to

CO Number	CO Statement	Knowledge Level
CO1	Enumerate the industrially important microorganisms.	K1
CO2	Demonstrate various types Fermentation methods.	K2
CO3	Handle and establish the techniques of Immobilization.	K2
CO4	Produce Single Cell Protein, Biofertilizer and Bio -Enzymes.	K3
CO5	Understand the skills and basic techniques of Antibiotic Sensitivity Test of Microorganisms.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	L	S	S

S-Strong, M-Medium, L-Low

CORE PRACTICAL – VI
LAB IN MICROBIAL BIOTECHNOLOGY

1. Isolation of industrially important microorganisms.
2. Isolation and of Lactic acid bacteria.
3. Immobilization of algal cells and enzymes by Sodium Alginate method.
4. Immobilization of algal cells and enzymes in agarose cubes.
5. Isolation of amylase producing organisms.
6. Wine production by yeast.
7. Pro - Mushroom Cultivation
8. Biofertilizer Production – Azolla and Vermicompost.
9. Production of Bio-Enzyme from Food waste.
10. Bioassay techniques for antibiotics - Test for Antibiotic sensitivity of microorganisms by Disc method and Agar well diffusion method.
11. Physical Mutagenesis – UV method.
12. Visit to Distillery unit; alcohol production and pharmacological industries.
Pasteur Institute (Field visit).

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Aneja.K.R	Experiments in Microbiology, Plant Pathology, Tissue Culture and Microbial Biotechnology. 5 th Edition.	New Age International (P) Ltd, New Delhi, India.	2018
2	Fernanda Mozzi, Rahul.R.Raya, Graciela.M.Vignolo	Biotechnology of Lactic Acid Bacteria – Novel Applications. Second Edition.	Wiley – Blackwell, New Jersey, United States.	2015
3	FarshadDarvishiHarzevili, Hongzhang Chen	Microbial Biotechnology – Progress and Trends	Taylor & Francis/ Routledge, UK.	2014
4	Surajit Das, HirakRanjan Dash	Microbial Biotechnology – A Laboratory Manual for Bacterial System	Springer India.	2014

5	Singh.P	Recent Trends in Microbial Biotechnology.	CBS, Chennai, India.	2013
6	Thatoi .H.N, Mishra.B.B	Microbial Biotechnology - Methods and Applications.	Alpha Science International, UK	2012
7	El-Mansi.E.M.T, Bryce.C.F.A, Dahhou. B, Sanchez.S, Demain.A.L, Allman.A.R.	Fermentation Microbiology and Biotechnology, Third Edition	Taylor & Francis, UK	2012

Web Links

- <https://youtu.be/oormRweSf3E>
- <https://youtu.be/HqbVca1elak>
- <https://youtu.be/4nNQEO8ZQR0>
- <https://youtu.be/9u-UEqiUZtk>
- <https://youtu.be/sIWADw9vFNM>

MAJOR BASED ELECTIVE- II (A)
ENVIRONMENTAL BIOTECHNOLOGY

Semester – VI	ENVIRONMENTAL BIOTECHNOLOGY	Hours/Week – 6	
Major Based Elective-II (A)		Credits – 6	
Course Code-19UBT6MBE2A		Internal 25	External 75

Objectives

- To know the basic concept and scope of environmental biotechnology
- To study the Applications of biotechnology in environmental monitoring.
- To analyse Bio sensors in environmental protection.
- To understand the achievements of biotechnology in Environmental Management.

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO 1	Demonstrate the utilization of microbial processes in waste.	K1
CO 2	Describe the concept of pollution management.	K2
CO 3	Apply the Green manuring technology for crop production.	K3
CO 4	Apply the concepts of Biotechnology in Environmental Management.	K3
CO 5	Apply the practical skills for entrepreneurial development in biofertilizer production	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	S	S
CO5	S	S	S	S

S- Strong, M- Medium, L-Low

MAJOR BASED ELECTIVE- II (A)
ENVIRONMENTAL BIOTECHNOLOGY

Unit I - Introduction to Environmental Biotechnology **18 Hours**

Basic components of environment. Definition – concept and scope of ecosystem, abiotic and biotic components. Environmental pollution: Air - Types of Air Pollutants: Sources, Effects and control of Air pollution .Water pollution- Sources, Effects and control of Water pollution and Soil pollution- Sources, Effects and control of Water pollution. Liquid Waste management - Sewage water treatment – Process involved- Dilution, Mechanical treatments, Biological treatments, Chemical treatments.

Unit II - Role of Biotechnology in Waste management **18 Hours**

Solid waste management. Classification of Solid waste management- Municipal Solid Waste and Hazardous Solid Waste. Nitrification and denitrification – microbial fundamentals and application. Aerobic processes: Activated sludge, oxidation ditches, trickling filters, towers, rotating discs, rotating drums, oxidation ponds. Anaerobic processes: Anaerobic digestion, anaerobic filters, up flow anaerobic sludge blanket reactor.

Unit III - Biodegradation and Bioremediation **18 Hours**

Principle and mechanism of biodegradation, Biodegradation of xenobiotic compounds (Lignin, Hydrocarbons, Detergents, Dyes and pesticides). Biodegradation of agro chemicals and other organic compounds – Biotransformation of xenobiotic compound; Bioremediation- Principles - Bioscrubbers – Biomining of metals - Biopulping. Phytoremediation: Use of plants for removal of organic and metallic pollutants.

Unit IV - Biotechnology and value addition **18 Hours**

Biofertilizers- Different types of biofertilizer -Rhizobium, Azotobacter, Azospirillum, cyanobacteria- Azolla .Production of biofertilizers (Azolla): Criteria for strain selection, steps for preparing biofertilizers (Seed pelleting, inoculant carriers, quality standards for inoculants), Green manuring for crop production. Application of biofertilizers. Algal Biomass- Chlorella and Spirulina. Factors Affecting Biomass Production. Mass Production ofSpirulina. Types of Spirulina Production - Semi-natural lake system and artificially built cultivation system - Clean water system and Waste water system. Uses of Spirulina - Single Cell Protein - protein supplemented food, health food, therapeutic and natural Medicine, Cosmetics.

Unit V- Environmental Monitoring**18 Hours**

Environmental monitoring: environmental impacts and their assessments using bioindicators, Biomarkers, biosensors and toxicity testing Air, water and soil sampling. Merits and demerits Bio-tools for environmental monitoring – Role of biotechnology in environmental protection. Various environmental standards: air, water and noise quality. Environment protection Act: environmental laws, policies, ethics. #Global Environmental Current Issues. #Social responsibilities of Environmental protection and Monitoring.

#-Self-Study Topics**Text Books**

S. No.	Author	Title	Publisher	Year of Publication
1	Pradipta Kumar Mohapatra	Textbook of Environmental Biotechnology	Dreamtech Press, Wiley India Pvt Ltd.	2020
2	Daniel Vallero	Environmental Biotechnology: A Biosystems Approach	Academic Press	2015
3	Pramod Kumar, Vipin Kumar and Pravin Kumar Sachan	Textbook of Environmental Biotechnology	WPI, India Pvt. Ltd	2018
4	Lakhveer Singh, Vipin Chandra Kalia	Waste Biomass Management - A Holistic Approach	Springer International Publishing	2017
5	Anonim	Environmental Biotechnology	I. K. International Pvt Ltd	2017

Reference Books

S.No	Author	Title	Publisher	Year of Publication
1	JeyabalanSangeetha	Environmental Biotechnology	CRC Press	2016
2	Roberto Adkins	Environmental Biotechnology	Scientific e-Resources	2019
3	Bruce E. Rittmann	Environmental Biotechnology Principles and Applications	McGraw-Hill Education	2020

4	IndhuShekhar Thakur	Environmental Biotechnology Basic Concepts and Applications	I. K. International Pvt Ltd	2021
5	Dilip Kumar Markandey	Environmental Biotechnology	APH Publishing	2021

Pedagogy

- Lecture (Chalk and Talk) & Power Point Presentation
- Quiz, Seminar, Assignment & Group Discussion.
- Videos and Animations

Web links

- <https://www.digimat.in/nptel/courses/video/102105087/L01.html>
- www.hydrosilintl.com
- https://www.youtube.com/watch?v=qs_oO0NqvK8&t=26s
- <https://www.digimat.in/nptel/courses/video/102105088/L01.html>
- [https://www.youtube.com/watch?v=qOshPABx9D4m/watch?](https://www.youtube.com/watch?v=qOshPABx9D4m)
- <https://www.youtube.com/watch?v=giJWzLQc15s>
- https://www.youtube.com/watch?v=Tgiz4_i_2X4

MAJOR BASED ELECTIVE-II (B)

STEM CELL BIOLOGY

Semester – VI	STEM CELL BIOLOGY	Hours/Week - 6	
Major Based Elective – II (B)		Credits - 6	
Course Code - 19UBT6MBE2B		Internal 25	External 75

Objectives

- To understand the basic concepts of Stem cell biology
- To afford the knowledge about stem cell epigenetics
- To provide an overview of potential clinical use of stem cells

Course Outcome

On successful completion of the course, the students will be able to

CO Number	CO statement	Knowledge level
CO1	Define the fundamental scientific principles of embryonic and adult stem cells.	K1
CO2	Explain the techniques involved in isolation, maintain and growth of stem cells.	K2
CO3	Outline the basic concepts in stem cell epigenetics.	K2
CO4	Make use of the potential benefits and clinical applications of stem cells	K3
CO5	Utilize the clinical significance and ethical issues pertaining to stem cell research	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	S	M	M
CO2	M	S	S	S
CO3	M	S	M	M
CO4	M	S	M	S
CO5	S	S	S	S

S-Strong, M-Medium, L-Low

MAJOR BASED ELECTIVE-II (B)

STEM CELL BIOLOGY

Unit I- Introduction to Stem cells

15 Hours

Stem cell – Introduction, History, Properties, Potency – Totipotent, Pluripotent, Multipotent, Oligopotent, Unipotent; Types – Embryonic and Adult Stem cells. Stem cell niche - Components and function. Cell cycle regulation in stem cells.

Unit II- Stem cell culture

20 Hours

Isolation of Embryonic stem cell and Adult stem cell – Blastocyst from IVF, Umbilical Cord, Somatic Cell Nuclear Transfer, Bone marrow. Culture Media – Feeder cell layers, Serum and feeder free media, growth factors. Stem cell expansion and differentiation. Cryopreservation and storage techniques of stem cells. Stem cell bank.

Unit III- Stem cell epigenetics

20 Hours

Epigenetic mechanisms in normal development - DNA Methylation, histone modifications and Micro-RNAs. Cell Reprogramming – Induction and Maintenance of pluripotency and differentiation of pluripotency into various cell lineages.

Unit IV- Application of Stem Cells

20 Hours

Application of stem cells in disease management and treatment - Neurodegenerative diseases, autoimmune disease, ocular disease, spinal cord injury, cardiovascular disease, Cancer, diabetes, burns and skin ulcers, muscular dystrophy, cell replacement and gene therapy.

Unit V- Stem Cell Ethics

15 Hours

Ethical and legal issues in stem cell research and therapy[#]. Regulatory Guidelines from ISSCR (International Society for Stem Cell Research), CLAA (Central Licensing Approving Authority); FDA, National Guidelines for Stem Cell Research (NGSCR) and NAC-SCRT (National Apex Committee for Stem Cell Research and Therapy).

-Self-Study Topic

Text books

S. No.	Author	Title	Publisher	Year of Publication
1	Gian Paolo Bagnara, Laura Bonisi&Francesco Alviano	Stem Cells	SocietaEditriceEsculapio	2020
2	Gerd Klein and Patrick Wuchter	Stem Cell Mobilization – Methods and Protocols	Humana	2019
3	Jonathan M. W. Slack	The Science of Stem cells	Wiley Blackwell	2018
4	Jack Collins	Essentials of Stem cell biology	Foster Academics	2017
5	Rob Burgess	Stem Cells – A short course	Wiley Blackwell	2016

Reference books

S. No.	Author	Title	Publisher	Year of Publication
1	Mirna Perez-Moreno	Advances in Stem Cells and their Niches - Epidermal Stem Cell Niche Volume 3	Academic Press Inc	2019
2	Phuc Van Pham and AchimRosemann	Stem Cells in Clinical Applications - Safety, Ethics and Regulations	Springer	2017
3	Ahmed El-Hashash	Developmental and stem cell biology in health and disease	Bentham Science	2017
4	Neil H Riordan P A	Stem Cell therapy – A Rising tide	Zaccheus Entertainment	2017
5	TarikRegad, Thomas Sayers & Robert Rees	Principle of Stem cell Biology and cancer : Future Applications and Therapeutics	Wiley Blackwell	2015

Pedagogy

- Lecture (Chalk and Talk) & Power Point Presentation
- Quiz, Seminar, Assignment & Group Discussion.
- Videos and Animations

Web Links

- <https://www.creative-diagnostics.com/stem-cell-epigenetics.htm>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4020242/>
- <https://maplepub.com/article/OVERVIEW-OF-CURRENT-REGULATORY-PRACTICES-CHALLENGES-GUIDANCE-FOR-REGULATION-OF-STEM-CELLS-AND-STEM-CELL-DERIVED-PRODUCTS-IN-INDIA>
- https://stemcells.nih.gov/info/Regenerative_Medicine/2006Chapter1.htm
- <https://stemcells.nih.gov/info/2001report/chapter4.htm>

MAJOR BASED ELECTIVE – III (A)**BIOENTREPRENEURSHIP**

Semester – VI	BIOENTREPRENEURSHIP	Hours/Week - 6	
Major Based Elective – III (A)		Credits – 6	
Course Code – 19UBT6MBE3A		Internal 25	External 75

Objectives

- To motivate students towards bioentrepreneurship and skill development
- To understand the basic marketing strategies from lab to store
- To expose the students to various technology and their commercialization
- To gain technological and financial knowledge for related to biotechnology

Course Outcomes

On the Successful completion of the course the students would be able to

CO Number	CO Statement	Knowledge Level
CO 1	Understand the basic concepts in entrepreneurship and marketing strategies related to biotechnology	K1
CO 2	Demonstrate the composting process using various methods	K2
CO 3	Learn apiculture concepts and methods	K3
CO 4	Analyse the techniques and methods in mushroom cultivation	K3
CO 5	Implement an integrated farming system with multiple Components	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	M	M	S	S
CO3	M	S	S	M
CO4	S	S	M	S
CO5	S	S	S	S

S- Strong, M- Medium, L-Low

MAJOR BASED ELECTIVE – III (A)

BIOENTREPRENEURSHIP

Unit I- Introduction to Bioentrepreneurship **18 hours**

Introduction to bioentrepreneurship – basic concepts, marketing strategies, Entrepreneurship Traits and Motivation: Growth of entrepreneurship, steps involved in converting ideas to products – commercialization methods, Growth of entrepreneurship, Funding opportunities, IP and licensing, start-ups in biotechnology. Training, Institution in aid of entrepreneur, Risks and benefit.

Unit II- Compost and Vermicompost **18 hours**

Compost - Purpose of Composting. Decomposition of organics - Aerobic and Anaerobic Digestion. Factors Affecting Composting Process – Carbon – Nitrogen ratio – Moisture - Temperature – Aeration – Surface area – pH. Advantages of application of Organic Fertilizer. Limitations of Composting, Applications. Vermicompost – Earthworm – Biology of Earthworm – Life cycle – Classification – Species Suitable for processing organic wastes. Microbial biomass responsible during the vermicomposting.

Unit III- Apiculture **20 hours**

Introduction to Beekeeping. History of apiculture. Importance of honey bees. Different species of honey bees. Morphology, anatomy, colony organization and life cycle of honey bees. Beekeeping equipment. Beekeeping in India. Benefits of beekeeping. Social behaviour. Queen rearing. Collection and preservation of bee pasture. Seasonal management. Diseases affecting honey bees and their control measures. Handling of bee colonies and manipulation for honey production. Potential market of honey. Economics of beekeeping.

Unit IV- Mushroom cultivation **20 hours**

Mushroom culture – historical background, current status of mushroom culture in India. Nutritional values – cultivation methods; Obtaining a pure culture preparation of spawn; formulation and preparation of composts; spawning, spawn running and cropping; cultivation of paddy straw mushrooms - cultivation of Dhingri (*Pleurotussajorcaju*) medicinal value of mushrooms – Ganoderma, antiviral value, antibacterial, antifungal and antitumour effect. Recipes of mushroom (Mushroom soup, pulav)[#], preservation and packaging of mushrooms – economics of mushroom production.

Unit V- Integrated Farming System (IFS)**14 hours**

Integrated Farming System - introduction, principles, Components of IFS, advantages of IFS, Farming System Research, IFS for Different Agroclimatic Zones, Production and Economics of IFS, Resource Flow – Wetland – Gardenland – Dryland.

#-Self-Study Topics**Text Books**

S. No	Author	Title	Publisher	Year of Publication
1	Craig Shimasaki	Biotechnology Entrepreneurship: Starting, Managing, and Leading Biotech	Academic Press	2014
2	Matei, Florentina, Zirra, Daniela	Introduction to Biotech Entrepreneurship: From Idea to Business: A European Perspective	Springer	2019
3	R. Gogoi, Y. Rathaiah, T.R. Borah	Mushroom Cultivation Technology	Scientific Publishers	2019
4	Dr. Ashok K. Rathour, Dr. Pawan Kumar 'Bharti', Dr. Jaswant Ray,	Vermitechnology Farmand Fertilizer	Discovery publishing House Pvt Ltd, New Delhi, India.	2020
5	A. Zaman	Integrated Farming System and Agricultural Sustainability	New India Publishing Agency	2019

Reference Books

S. No	Author	Title	Publisher	Year of Publication
1	Heidrun Flaadt Cervini, Jörg Dogwiler	Bio- and MedTech Entrepreneurship From Start-up to Exit	Stämpfli Verlag	2020
2	Tavis Lynch	Mushroom Cultivation An Illustrated Guide to Growing Your Own Mushrooms at Home	Quarry Books	2018

3	John Tyler	Essential Guide to Mushroom Cultivation A Definite Guide to Cultivation and Self Use	Independently Published	2019
4	Rhonda Sherman	The Worm Farmer's Handbook Mid- to Large-Scale Vermicomposting for Farms, Businesses, Municipalities, Schools, and Institutions	Chelsea Green Publishing	2018
5	Shawn Jadrnicek, Stephanie Jadrnicek	The Bio-integrated Farm A Revolutionary Permaculture-based System Using Greenhouses, Ponds, Compost Piles, Aquaponics, Chickens, and More	Chelsea Green Publishing	2016

Pedagogy

- Lecture (Chalk and Talk) & Power Point Presentation
- Quiz, Seminar, Assignment & Group Discussion.
- Videos and Animations

Web links

- <https://www.nationalbioentrepreneurship.in/>
- <https://www.acs.edu.au/courses/mushroom-production-86.aspx>
- https://onlinecourses.swayam2.ac.in/nos20_ge07/preview
- <https://www.youtube.com/watch?v=4nNQEO8ZQR0>
- https://agritech.tnau.ac.in/agriculture/agri_majorareas_smmf03.html

MAJOR BASED ELECTIVE – III (B)
DRUG DISCOVERY AND DEVELOPMENT

Semester – VI	DRUG DISCOVERY AND DEVELOPMENT	Hours/Week - 6	
Major Based Elective – III (B)		Credits - 6	
Course Code - 19UBT6MBE3B		Internal 25	External 75

Objectives

- To study about the Basic techniques, methods and applications involved in Drug Designing.
- To understand the drug metabolism, mechanism of action including its kinetics and the principles of pharmacokinetics.
- To understand about the different regulatory aspects and novel drug delivery systems.

Course Outcomes

On successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO 1	Classify drugs based on their source, nature, nomenclature and dosage and routes of administration.	K1
CO 2	Interpret the current approaches of drug discovery with their advantages and limitations.	K2
CO 3	Summarize the fate of drug in the biological system.	K2
CO 4	Interpret the regulatory aspects and stages of drug development.	K3
CO 5	Impart the concepts of novel drug systems.	K3

Mapping with Programme Outcomes

Cos	PO1	PO2	PO3	PO4
CO1	M	M	S	S
CO2	M	M	S	S
CO3	S	S	S	S
CO4	S	S	M	S
CO5	S	M	S	S

S-Strong, M-Medium, L-Low

MAJOR BASED ELECTIVE – III (B)
DRUG DISCOVERY AND DEVELOPMENT

Unit I - General Pharmacology **18 Hours**

Drugs – Definition, sources and nature, types of classification, nomenclature, dosage, dose response curve and LD50. Role of drugs, Drug – Protein interactions and routes of administration. Mechanism of action. Pharmacokinetics and Pharmacodynamics. Protein therapeutics. Drug toxicity - definition, classification. Factors affecting toxicity.

Unit II - Stages in Drug Design **18 Hours**

Target Identification and validation: Drug targets – Membrane Proteins, DNA, RNA and enzymes. Lipinski's rule of five. Lead selection and optimization, drug candidate confirmation. Types of Receptors – Hormone, developmental - protein, carbohydrate and lipid receptors. Biological role and significance of each receptor. Neurotransmitters.

Unit III - ADME PROFILING **18 Hours**

Drug metabolism - Drug metabolizing enzymes and their induction- absorption, bioavailability, distribution, metabolism and Elimination Pathways. Efficacy assessment, Toxicology/safety pharmacology assessment.

Unit IV- Stages of Drug Development **18 Hours**

Drug development- Target identification, Target validation, Lead discovery and Optimization- Role of FDA. #Drug regulatory bodies in India –CDSCO, MHFW, IPC, ICMR, NPPA, The Drugs (Prices Controls) Order,1955. The Indian Patents and Designs, Act 1970, Magic Remedies and Objectionable advertisements Act. Intellectual property rights. Computer aided drug designing (CADD), structure based drug design, QSAR, HTP screening, molecular docking.

Unit V- Novel Drug Delivery Systems **18 Hours**

Novel Drug delivery systems – Carrier based Drug Delivery System, Liposomes, Nanoparticles, Microspheres, Monoclonal antibodies, Niosomes, Resealed erythrocytes as drug carriers. Transdermal Drug Delivery Systems, Sonophoresis, Osmotic drug delivery systems, Microencapsulation.

Self Study Topics

S. No.	Author	Title	Publisher	Year Publication
1	H. L. Sharma and K. K. Sharma	Principles of Pharmacology	Paras Medical Publishers	2017
2	Donald J. Abraham	Burger's Medicinal Chemistry, Drug Discovery and Development	Wiley	2021
3	Sakthivel Lakshmana Prabu, Appavoo Umamaheswari	Computer Applications in Drug Discovery and Development	IGI Global	2018
4	Ansel, H.C.	“Pharmaceutical Dosage Forms and Drug Delivery Systems”	Lippincott Williams and Wilkins	2018
5	Ranabir Chanda, Alugubelli Gopi	Textbook of Novel Drug Delivery System	AITBS Publishers	2019

Reference books

S. No.	Author	Title	Publisher	Year of Publication
1	Laurence Gilman S	“The Pharmacological Basis of Therapeutics”	McGraw-Hill Education / Medical	2017
2	Tom Brody	Clinical Trials: Study Design, Endpoints and Biomarkers, Drug Safety, and FDA and ICH Guidelines	Academic Press	2016
3	Donald J. Abraham	Burger's Medicinal Chemistry, Drug Discovery and Development	Wiley	2021
4	John Somberg, Vincent Idemyor, James T. O'Donnell	Drug Discovery and Development, Third Edition	CRC Press	2019
5	Binghe Wang, Longqin Hu, Teruna J. Siahaan	Drug Delivery: Principles and Applications	Wiley Blackwel, 2nd Edition	2016

Pedagogy

Lecture, Power Point Presentation, Assignment, Seminar, Quiz, Group Discussion, Video

Web links

- <https://www.fda.gov/patients/drug-development-process/step-1-discovery-and-development> <https://www.nebiolab.com/drug-discovery-and-development-process/>
- <https://nptel.ac.in/content/storage2/courses/104103071/pdf/mod15.pdf>
- <https://nptel.ac.in/courses/102/106/102106070/>
- <https://www.abdn.ac.uk/study/postgraduate-taught/degree-programmes/55/drug-discovery-and-development/>

SEM VI	GENDER STUDIES	Category	Course Code	Instructional Hours	Credit
		Gender Studies	19UGGS	15	1

Preamble

The course enlightens the learners on the basic concepts of Sex, Gender, Problems and welfare measures for Women.

Course Outcomes

On the successful completion of this course, the students will able to

CO Number	CO Statement	KNOWLEDG E LEVEL
CO1.	Define the basic concepts of Gender	K1
CO2.	Recall the role of gender in social institutions	K1
CO3.	Explain the forms of Gender Based Violence	K2
CO4.	Demonstrate the health status of Indian Women	K2
CO5	Identify the practices of gender equality and equity in society.	K3

Syllabus

Unit I (3 hours)

Understanding Basic Concepts: Sex, Gender, Sexuality; Femininities, Masculinities and other sexualities; Gender Identity Theories

Unit II (3 hours)

Gender and Society: Family, Marriage, Kinship, Religious Institutions; Social Stratification: Caste and Class; Power, Race and Ethnicity; Community and Religion

Unit III (3 hours)

Gender Based Violence: Structures, Forms and Types: Caste, Tribe, Ethnicity and Minority; differently -abled and elderly persons; Perspectives and Consequences of Violence against Women

Unit IV (3 hours)

Gender and Health: Sexual and reproductive health, Mental health and wellbeing, Occupational health, Impact of violence on women's health

Unit V (3 hours)

Gender and Equality: Gender Discrimination; Gender Division of labour; Gender Stereotyping; Gender Sensitivity – Gender Equity and Equality; Committees and Commissions, Reports, State Policies

References:

1. Agarwal Bina, Humphries Jane and Robeyns Ingrid(ed.). (2006). Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi: Oxford University Press.
2. Anuja Mahapatra and Sukhadeb Naik. (2013). Crime against Girls and Women: Global Perspective and Challenges, New Delhi: Enkay Publishing House,
3. Arya Sadhna. (2000). Women, Gender Equality and the State, New Delhi: Deep & Deep Publication.
4. Bhasin Kamala. (1993). What is Patriarchy? : Gender Basics, New Delhi: Women Unlimited.
5. Bhasin Kamala. (2004). Understanding Gender: Gender Basics, New Delhi: Women Unlimited
6. Bhasin Kamala. (2004). Exploring Masculinity: Gender Basics, New Delhi: Women Unlimited.
7. Bhattacharya Malini.(2002). Sexual Violence and Law, Kolkata; West Bengal Commission for Women
8. Chloe E. Bird, Patricia P. Rieker. (2008). Gender and Health, Cambridge University Press.
9. Chari Leelavathi. (1987). Know Your Rights, Madras; Tamilnadu Social Welfare Board.
10. Debra L. Nelson, Ronald J. Burke. (2016). Gender, Work Stress and Health, American Psychological Association.
11. Dasgupta, Sanjukta, Sudeshma Chkravarty and Marry Mathew.(2013). Radical Rabindranath: Nation, Family and Gender in Tagore's Fiction and Films
12. Krishna Sumi, (ed.). (2004). Livelihood and Gender: Equity in Community Resource Management, New Delhi: Sage Publication.
13. Lips, Hilary M. (2015). Gender the basics, Routledge, London
14. Marcia Bayne-Smith.(1995). Race, Gender and Health, Sage Publications,
15. Marie L. Miville (2013). Multicultural Gender Roles: Applications for Mental Health and Education, Columbia University.
16. Menon, Nivedita.(ed.). (2007). Sexualities. Women Unlimited. New Delhi.
17. Mishra .O.P. (2001). Law Relating to Women & Child, Allahabad: Central Law Agency.
18. Misra Geetanjali, Chandiramani Radhika (ed.) .(2005). Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi: Sage Publication.
19. Mohanty Manoranjan (ed.).(2004). Class ,Caste ,Gender : Readings in Indian Government And Politics – 5, New Delhi : Sage Publications.
20. Nilika Mehrotra.(2013). Disability, gender and state policy: exploring margins, Rawat Publications, New Delhi.
21. Oberoi, Patricia.(2006). Freedom and Destiny: Gender, Family and Popular Culture in India, Oxford University Press
22. Pauline M. Prior(1999). Gender and Mental Health, NYU Press.
23. Pauline M. Prior. (2000). Gender and Mental Health, The British Journal of Psychiatry.
24. Pernau Margrit, Ahmad Imtiaz, Reifeld Hermut (ed.).(2003). Family and Gender: Changing Values in Germany and India ,New Delhi :Sage Publications.
25. Pludi. A Michele (ed.) Praeger.(2004). Guide to the Psychology of Gender, London : Praeger Publisher.
26. Radhakrishnan, Smitha, (2012). Appropriately Indian: Gender and Culture in a New Transnational Class, Orient Black Swan
27. Rajadurai. S.V, Geetha.V, (2007). Themes in Caste Gender and Religion, Tiruchirappalli: Bharathidasan University.
28. Rege, Sharmila.(2003). Sociology of Gender, New Delhi: Sage.
29. Rege, Sharmila.(2006). Writing Caste/Writing Gender, Zubaan
30. Saha Chandana.(2003). Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publication.
31. Sakshi Sexual Harassment at the Workplace – A Guide New Delhi.
32. Sangari, Kumkum and Sudesh Vaid ed. 1994, Women & Culture, SNTD Women's

University Series

33. Shira, Tarrant. 2006. When Sex Became Gender, New York: Routledge.

34. Sujata Mishra. (2011). Women's Health and Social Issues, Arise Pub., New Delhi.

35. Uma Chakravarti, (2016) Thinking Gender, Doing Gender, Orient Black Swan Privatelimited.

36. Wharton.S Amy.(2005).The Sociology of Gender : An Introduction to Theory and Research, USA: Blackwell Publishing.

Pedagogy: Chalk & Talk, lecture, Seminar, E Content, E Quiz, Group Discussion, Case Study, Flipped Classroom, Google classroom & Google meet.

Course Designer: Dr. G. Mettilda Buvanewari

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-620 018.



DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

UG – B.Sc., NUTRITION AND DIETETICS

PG – M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

AGENDA

Date : 12/10/2022

Venue: Dept. of FSM&D

Time : 2.30pm

1. ITEM NO.BOS/07/01

To consider and to approve the Programme Structure (Six Semesters) of B.Sc., Nutrition and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. ITEM NO.BOS/07/02

To consider and to approve the ratification of I Semester syllabus of B.Sc., Nutrition and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18

3. ITEM NO.BOS/07/03

To consider and to approve the II semester syllabus of B.Sc., Nutrition and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

4. ITEM NO.BOS/07/04

To consider and to approve the Programme Structure (four semester) of M.Sc., Food Service Management and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

5. ITEM NO.BOS/07/05

To consider and to approve the ratification of I Semester syllabus of M.Sc., Food Service Management and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18

6. ITEM NO.BOS/07/06

To consider and to approve the II semester syllabus of M.Sc., Food Service Management and Dietetics for 2022-2023 Batch and onwards and recommend to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

7. ITEM NO.BOS/07/07

To discuss about evaluation pattern of Internship for M.Sc., Food Service Management and Dietetics

8. ITEM NO.BOS/07/08

To appreciate board of studies members who contributed to prepare syllabus

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-620 018.

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS

Minutes of Board of Studies Meeting of Department of Food Service Management and Dietetics held on 12/10/2022 at 2.30 pm.

The following members attended the meeting

Category	Members
Chairman Head of the Department	Ms.B.Thanuja M.Sc., M.Phil., SET.
Two subject experts from outside the parent University nominated by the Academic Council.	Dr.R.Jaganmohan Professor & Head, Department of Food Product Development, National Institute of Food Technology, Entrepreneurship and Management -Thanjavur (NIFTEM-T) – 613005.
	Dr.S.Alamelu Mangai Assistant Professor(SG), PG & Research Department of Home Science, Bharathidasan Government College for Women (Autonomous), Affiliated to Pondicherry University, Puducherry.
One expert nominated by the vice-Chancellor	Dr.S.Uma Mageshwari Professor & Head, Dean Student Affairs, Dept of Food Service Management and Dietetics, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore.
One International Academic Expert	Ms.Lakshmi Priya Balaji, Consultant Nutritionist and Content Writer, Internationally Educated Dietitian Network of Canada, Ontario, Canada.
One representative from industry / corporate sector / allied area relating to the placement.	Ms.Parimala Devi Kumara Swamy [Associate Registered Nutritionist & Certified Diabetes Educator(UK)], Founder & Consultant Dietitian – Parims Nutrition, 29, Sarojini Street, Ramnagar, Coimbatore.
One postgraduate meritorious alumnus nominated by the principal.	Ms.Ruby Thomas Territory Nutrition Manager, Hindustan Unilever Limited, Bangalore.

Special Invitee	Dr.P.R.Janci Rani Assistant Professor (SG), Department of Sciences, (Food Science & Nutrition), Amrita School of Engineering, Amrita Vishwa Vidyapeetham, Amrita Nagar (PO), Ettimadai, Coimbatore.
Two Student Representatives	1.K.Nikitha (I M.Sc FSM&D) 2. VL.Abikaysavee (II M.Sc FSM&D)
Internal Members	Ms.S.Fathima M.Sc., NET. Ms.V.Ramya M.Sc., M.Phil., SLET. Ms.M.Vinothini M.Sc., M.Phil., SET. Ms.S.Agalya M.Sc., NET. Ms.E.Agalya M.Sc., M.Phil. Ms.T.R.Revathi M.Sc., NET. Ms.C.Nivetha M.Sc.

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
Nationally Accredited (III Cycle) with A Grade by NAAC
ISO 9001:2015 Certified
Annamalainagar, Trichy-18

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
ACTION TAKEN REPORT OF SIXTH BOS MEET HELD ON 06/05/2022

The Sixth BOS Meeting was held on 06/05/2022 . The Chairman of the BOS read the minutes of the meeting and the Resolution ITEM NO.BOS/06/01 pertaining to I Semester Syllabus of B.Sc., Nutrition & Dietetics and the Resolution ITEM NO.BOS/06/02 pertaining to I Semester Syllabus of M.Sc., Food Service Management & Dietetics were confirmed and other Resolutions ITEM NO.BOS/06/03 to ITEM NO.BOS/06/05 were approved.

Minutes of Seventh Meeting of the Board of Studies

The Minutes of the meeting is as follows:

1. RESOLUTION NO. BOS/07/01

Considered and approved the Programme Structure (Six Semesters) of B.Sc., Nutrition and Dietetics for 2022-2023 Batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

2. RESOLUTION NO.BOS/07/02

Ratification considered and approved in the below mentioned courses, in the I Semester syllabus of B.Sc., Nutrition and Dietetics for 2022-2023 Batch and onwards.

- Change of Course Code - Allied course - Food Microbiology – Practical
22UND1AC2P
- Introduction of self-study as sixth unit in the courses such as
Food Science - 22UND1CC1
Food Microbiology - 22UND1AC1
- Change in the style and format of Text books and Reference books.

3. RESOLUTION NO.BOS/07/03

➤ Revision of syllabus of

❖ Core Course II - Nutrition Through Life Span -22UND2CC2

Topics included

- Unit I (a) - Nutrient needs, Dietary reference intake, Dietary guidelines
- Unit II - Pre and peri conceptional nutrition during pregnancy
- Unit III -Dietary management issues in infant feeding
- Unit V - Nutrition and work efficiency

External members recommended to include

- UNIT I - Factors influencing meal planning for all age groups
- UNIT II - Stages of pregnancy,
- UNIT III - Types of weaning, Complication in infant feeding - Low birth weight and artificial feeding, special children.
- UNIT V - Recommended to replace the term old age as elderly.
- UNIT VI -Self Study - Include traditional lactogogue foods.

To change the reference books with latest edition.

❖ Core Practical II-Nutrition Through Life Span –Practical -22UND2CC2P

External members recommended to

Include preparation of supplementary food, mention specific age group (Adult man and women; Adolescent boy and girl) and economic status.

❖ Core Course III - Macro and Micro Nutrients -22UND2CC3

Topics included

Unit I - Classification of nutrients, National and International recommendation for nutrient requirements.

Unit II - Specific Dynamic Action.

External members recommended to

Delete the content

Unit I – Definition of Nutrition (Can be included in self study, because this is supposed to be repetition)

Include

Unit II – b. Basal Metabolic Rate and factors affecting BMR.

Delete RDA in all units. (Because already existing in the course -Nutrition Through Life Span)

❖ First Allied Course III- Human Physiology -22UND2CC2P

Topics included

Unit I - Composition of lymph

Unit V (b) - Sense organs

Unit V (c) - Skin and tissues

External members recommended to include

Unit VI -Hunger mechanism (self study).

In Practical suggested to mention method of estimation of heamoglobin.

➤ **External members suggested to check**

Programme outcome and Programme specific outcome mapping correlation for all the courses.

4. RESOLUTION NO.BOS/07/04

Considered and approved the Programme Structure (Four semester) of M.Sc., Food Service Management and Dietetics for 2022-2023 Batch and onwards and recommended to the Academic Council, Cauvery College for Women (Autonomous), Trichy-18.

5. RESOLUTION NO.BOS/07/05

Ratification considered and approved in the below mentioned courses, in the I Semester syllabus of M.Sc., Food Service Management and Dietetics for 2022-2023 Batch and onwards.

- Change of credit for the course Human Nutrition and Public Health - 22PFS1CC2- credit as 4. So total credit for Semester I - 22
- Change of Course code for Disciple Specific Elective Course
 - A. Applied Physiology -22PFS1DSE1A
 - B. Nutrition for Fitness - 22PFS1DSE1B
 - C. Nutrition in Clinical Critical Care -22PFS1DSE1C

6.RESOLUTION NO.BOS/07/06

➤ **Revision of syllabus of**

❖ **Core Course IV -Management in Food Service Operations -22PFS2CC4**

Topics included

Unit III (a) -Forecasting

Unit V - Communication - channels of Communication

Topics deleted - Review of location of various functional areas (To be included in Food Service Facilities Course)

External members recommended to include

Food delivery system and

Unit II -theories of management to be mentioned.

Reference book -Author Mamoria

❖ **Core Course V- Advanced Dietetics II -22PFS2CC5**

Topics included

Unit V - Diet in Food Allergy and Nutritional care for patients having metabolic stress.

Some topics are rearranged.

Topics deleted

Unit II - Diabetes mellitus and Obesity. (Existing in Advanced Dietetics I).

External members recommended to Include

Unit I (a) - Myocardial Infarction .

Unit I (b) - Acute Renal failure (ARF), Chronic Renal Failure (CRF), End Stage Renal Disease (ESRD), Dialysis.

❖ **Core Choice Course I -Biochemistry and Metabolic Disorders -22PFS2CCC1A**

Topics included

Unit I - Clinical Enzymology and

Unit V - Tissue Protein

External members recommended to Include in

Unit III - Heavy metal poison

❖ **Core Choice Course I -Food Regulations and Quality Control -22PFS2CCC1B**

Newly introduced paper

External members recommended to

Change the course title from Food Regulations and Quality Control to Food Quality Control and Regulations.

Unit I (a) - Include methods of quality control, Voluntary quality standards and certification.

Recommended to add reference from e pathshala link.

Recommended to remove the organizational chart of FSSAI.

❖ **Core Choice Course I -Front Office Operations -22PFS2CCC1C**

Newly introduced paper

External members recommended to include

Unit III - Reservation procedure

Unit VI - Reservation apps (self study).

❖ **Core Practical II- Advanced Dietetics II –Practical -22PFS2CC2P**

External members recommended to

Remove chemotherapy and suggested to give as cancer treatment.

❖ **Discipline Specific Elective Course II - Functional Foods, Nutraceuticals and Nutrigenomics -22PFS2DSE2A**

Topic included

Unit V - Nutrigenomics

Some topics rearranged

External members recommended to include

Unit II – Ginger, meat liver, country chicken, country chicken egg

Unit IV – segregate diseases and disorders

❖ **Discipline Specific Elective Course II - Housekeeping and Interior Designing - 22PFS2DSE2B**

Newly introduced paper

External members recommended in

UNIT V – to give flower Arrangement as separate topic

Recommended to add reference from e pathshala link.

❖ **Discipline Specific Elective Course II - Food Packaging -22PFS2DSE2C**

Newly introduced paper

External members recommended to add

Unit V - BIS Standards

Unit VI - eco friendly, sustainable packaging (Self study)

7. RESOLUTION NO.BOS/07/07

Internship evaluation pattern -Suggested to give Internal and External evaluation.

External members recommended to include in the report preparation

- Waste management
- Energy effective technologies.

8. RESOLUTION NO.BOS/07/08

Appreciated board of studies members who contributed to prepare syllabus.

HEAD
DEPARTMENT OF FOOD SERVICE
MANAGEMENT AND DIETETICS
CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
TRICHY - 620 018

DEAN OF SCIENCE
CAUVERY COLLEGE FOR WOMEN
(AUTONOMOUS)
ANNAMALAI NAGAR
TIRUCHIRAPPALLI - 620 018
TAMILNADU

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DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



B.Sc., NUTRITION AND DIETETICS SYLLABUS

2022-2023 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF FOOD SERVICE MANAGEMENT
AND DIETETICS

VISION

To strengthen and integrate academic excellence, ethical values and social responsibility to develop a healthy nation by imparting skill based knowledge, professional competency and entrepreneurial skills.

MISSION

- To have a breadth of knowledge across the subject areas of Nutrition and Dietetics.
- To professionally enrich the students for successful career in Academia, Industry and Research.
- To promote and inculcate self-reliance, social relevance, sound value system and code of professional practice among students.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR
B.Sc., NUTRITION AND DIETETICS PROGRAMME

PO NO	Programme Outcome On completion of B.Sc., Programme, the students will be able to
PO1	ACADEMIC EXCELLENCE AND COMPETENCE Elicit firm fundamental knowledge in theory as well as practical for coherent understanding of academic field to pursue multi and interdisciplinary science careers in future.
PO2	HOLISTIC AND SOCIAL APPROACH Create novel ideas related to the scientific research concepts through advanced technology and sensitivity towards sustainable environmental practices as well as social issues.
PO3	PROFESSIONAL ETHICS AND TEAM WORK Explore professional responsibility through project strategies, internships, field trip/industrial visits and mentorship programmes to transmit communication skills.
PO4	CRITICAL AND SCIENTIFIC THINKING Equip training skills in internships, research Projects to do higher studies in multidisciplinary path with higher level of specialization to become professionals of high quality standards.
PO5	SOCIAL RESPONSIBILITY WITH ETHICAL VALUES Ensure ethical, social and moral values in the minds of learners and attain gender parity for building a healthy nation.

PROGRAMME SPECIFIC OUTCOMES FOR
B.Sc., NUTRITION AND DIETETICS PROGRAMME`

PSO NO	Programme Specific Outcomes` Students of B.Sc., Nutrition & Dietetics will be able to	POs Addressed
PSO1	Apply the knowledge of food science, nutrition and dietetics to resolve the scientific issues and problems.	PO1
PSO2	Assess the nutritional status and recommend nutritional support and therapeutic care as sustainable approach for better health and prevention of diseases.	PO1, PO2
PSO3	Associate physiological, biochemical and microbiological parameters with health and diseases.	PO1
PSO4	Develop technical and human relation skills in relation to food services, demonstrate professional attributes required to manage the hospitality industry and to communicate effectively in the context of nutrition and dietetics.	PO3, PO4
PSO5	Demonstrate critical thinking skills and analytical abilities to identify and solve problems through internships and projects.	PO4, PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
B.Sc., NUTRITION AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
(For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Part	Course	Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course – I (LC) – Tamil * / Other Languages *	Ikkala Ilakkiyam	22ULT1	6	3	3	25	75	100
			Basic French-I	22ULF1						
			Hindi Literature & Grammar-1	22ULH1						
			History of Popular Tales, Literature and Sanskrit Story	22ULS1						
	II	English Language Course-I(ELC)	Functional English for Effective Communication – I	22UE1	6	3	3	25	75	100
	III	Core Course – I(CC)	Food Science	22UND1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Food Science (P)	22UND1CC1P	3	3	3	40	60	100
		First Allied Course – I (AC)	Food Microbiology	22UND1AC1	4	3	3	25	75	100
		First Allied Course – II (AP)	Food Microbiology (P)	22UND1AC2P	4	3	3	40	60	100
	IV	Ability Enhancement Compulsory Course – I (AECC)	UGC Jeevan Kaushal - Universal Human Values	22UGVE	2	2	-	100	-	100
		TOTAL			30	22				700

II	I	Language Course – II (LC) – Tamil * / Other Languages *)	Idaikkala Illakiyamm Pudhinamm	22ULT2	5	3	3	25	75	100	
			Basic French-II	22ULF2							
			Hindi Literature & Grammar-II	22ULH2							
			Poetry, Textual Grammar and Alankara	22ULS2							
	II	English Language Course-II(ELC)	Functional English for Effective Communication – II	22UE2	6	3	3	25	75	100	
	III	Core Course – II (CC)	Nutrition Through Life Span	22UND2CC2	5	5	3	25	75	100	
		Core Practical - II (CP)	Nutrition Through Life Span (P)	22UND2CC2P	3	3	3	40	60	100	
		Core Course -III (CC)	Macro and Micro Nutrients	22UND2CC3	3	3	3	25	75	100	
		First Allied Course – III (AC)	Human Physiology	22UND2AC3	4	3	3	25	75	100	
	IV	Ability Enhancement Compulsory Course – II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100	
		Ability Enhancement Compulsory Course - III (AECC)	Innovation and Entrepreneurship	22UGIE	2	1	-	100	-	100	
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation						
			TOTAL		30	23					800

III	I	Language Course – III – Tamil * / Other languages *)	Kaapiyamum, Nadagamum	22ULT3	5	3	3			100
			Intermediate French-I	22ULF3						
			Hindi Literature & Grammar-III	22ULH3						
			Prose, Textual Grammar and Vakyarachana	22ULS3						
	II	English Language Course-III(ELC)	Learning Grammar Through Literature - I	22UE3	6	3	3			100
	III	Core Course– IV(CC)	Diet Therapy I	22UND3CC4	6	6	3	25	75	100
		Core Practical - III(CP)	Diet Therapy I (P)	22UND3CC3P	3	3	3	40	60	100
		Second Allied Course- I (AC)	Nutritional Biochemistry	22UND3AC4	4	3	3	25	75	100
		Second Allied Course – II (AP)	Nutritional Biochemistry (P)	22UND3AC5P	4	3	3	40	60	100
	IV	Generic Elective Course– I (GEC)	Basics in Nutrition	22UND3GEC1	2	2	3	25	75	100
Basic Tamil - I			22ULC3BT1							
Special Tamil - I			22ULC3ST1							
	Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation						
	TOTAL			30	23					700

15 Days INTERNSHIP during Semester Holidays

IV	I	Language Course – IV (LC) Tamil * / Other Languages*)	Pandaiya Ilakiyam	22ULT4	6	3	3			100
			Intermediate French-II	22ULF4						
			Hindi Literature & Functional Hindi	22ULH4						
			Drama, History of Drama Literature	22ULS4						
	II	English Language Course - IV(ELC)	Learning Grammar Through Literature - II	22UE4	6	3	3			100
	III	Core Course – V(CC)	Diet Therapy II	22UND4CC5	6	6	3	25	75	100
		Core Practical - IV(CP)	Diet Therapy II (P)	22UND4CC4P	4	4	3	40	60	100
		Second Allied Course – III (AC)	Food Chemistry	22UND4AC6	4	3	3	25	75	100
		Internship	Internship	22UND4INT	-	2	-	-	-	100
	IV	Generic Elective Course– II (GEC)	Meal Planning for the Family	22UND4GEC2	2	2	3	25	75	100
Basic Tamil - II			22ULC4BT2							
Special Tamil - II			22ULC4ST2							
	Skill Enhancement Course– I (SEC)	Basics in Food Production (P)	22UND4SEC1P	2	2	3	40	60	100	
	Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation						
	TOTAL			30	25					800

V	III	Core Course – VI(CC)	Food Processing and Preservation	22UND5CC6	6	6	3	25	75	100
		Core Practical – V(CP)	Food Processing and Preservation (P)	22UND5CC5P	3	3	3	40	60	100
		Core Course - VII(CC)	Basics in Research Methodology and Computer Applications	22UND5CC7	6	6	3	25	75	100
		Core Course – VIII(CC)	Community Nutrition	22UND5CC8	6	6	3	25	75	100
		Discipline Specific Elective – I (DSE)	A. Food Standards and Quality Control	22UND5DSE1A	5	4	3	25	75	100
	B. Food Product Development and Marketing		22UND5DSE1B							
	C. Front Office Management and Housekeeping		22UND5DSE1C							
	IV	Ability Enhancement Compulsory Course - IV (AECC)	UGC Jeevan Kaushal - Professional Skills	22UGPS	2	2	-	100	-	100
		Skill Enhancement Course – II (SEC)	Bakery and Confectionary (P)	22UND5SEC2P	2	2	3	40	60	100
		Extra Credit Course	SWAYAM ONLINE COURSE		As per UGC Recommendation					
	TOTAL			30	29					700

VI	III	Core Course – IX(CC)	Perspectives of Home Science	22UND6CC9	6	6	3	25	75	100
		Core Course – X(CC)	Food Service Management	22UND6CC10	5	5	3	25	75	100
		Core Course – XI(CC)	Cyber Security	22UGCS	5	4	3	25	75	100
		Core Practical – VI(CP)	Food Service Management (P)	22UND6CC6P	3	3	3	40	60	100
		Discipline Specific Elective – II (DSE)	A. Functional Foods and Nutraceuticals	22UND6DSE2A	5	4	3	25	75	100
			B. Sports Nutrition	22UND6DSE2B						
			C. Basics in Food Analysis	22UND6DSE2C						
	Project	Project Work	22UND6PW	5	4	-	-	100	100	
	V	Gender Studies	Gender Studies	22UGGS	1	1	-	100	-	100
		Extension activity		22UGEA	0	1	0	-	-	-
	TOTAL			30	28					700
	GRAND TOTAL			180	150					4400

Courses & Credits for UG Science Programmes

Part	Course	No. of Courses	Credits	Total Credits
I	Tamil/ Other Language	4	12	12
II	English	4	12	12
III	Core (Theory & Practical)	11 6	58 19	109
	Project Work	1	4	
	Internship	1	2	
	First Allied	3	9	
	Second Allied	3	9	
	DSE	2	8	
IV	GEC	2	4	15
	SEC	2	4	
	AECC-I -Universal Human Values	1	2	
	AECC-II-Environmental Studies	1	2	
	AECC-III-Innovation and Entrepreneurship	1	1	
	AECC-IV Professional Skills	1	2	
V	Gender Studies	1	1	02
	Extension Activities	–	1	
		44		150

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND1CC1	FOOD SCIENCE	CORE	5	5

Course Objectives

- To obtain knowledge on different food groups and their composition.
- To study the different methods of cooking.
- To understand the role of food groups in cookery.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Define and classify the food groups and different cooking methods.	K1,K2,K3,K4
CO 2	Explain structure, composition and processing of food groups.	K1,K2,K3,K4
CO 3	Illustrate the chemical reactions that occur during cooking and changes that occur during storage of fruits and vegetables.	K1,K2,K3,K4
CO 4	Predict properties and role of food groups in cookery.	K1,K2,K3,K4
CO 5	Examine the quality of egg and factors affecting tenderness of meat.	K1,K2,K3,K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	3
CO2	3	3	2	2	2	3	2	2	2	3
CO3	3	3	2	2	2	3	2	2	2	3
CO4	3	3	2	2	2	3	2	2	2	3
CO5	3	3	2	2	2	3	2	2	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. INTRODUCTION TO FOOD SCIENCE AND NUTRITIONAL CLASSIFICATION OF FOODS Definition of Food Science, Basic Five Food Groups, Food Pyramid, Nutritional classification of foods – Energy yielding, body building, protective and regulatory foods.</p> <p>b. CLASSIFICATION OF NUTRIENT Macro Nutrients - Carbohydrate, Protein and Fat and Micro Nutrients – Vitamins, Minerals and its Sources.</p> <p>c. COOKING METHODS Objectives, different types cooking methods- moist, dry heat methods, microwave cooking, combination of cooking methods and, Recent methods of cooking – Ohmic cooking and induction cooking - merits and demerits.</p>	16	CO1, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>a. CEREALS AND CEREAL PRODUCTS Structure, composition, nutritive value and milling of wheat and parboiling of rice. Nutritional importance of millets - (maize, jowar, ragi, bajra), malting of cereals and role of cereals in cookery.</p> <p>b. PULSES Composition, nutritive value, factors affecting cooking quality of pulses, germination, role of pulses in cookery.</p> <p>c. NUTS AND OILSEEDS Composition, Nutritive value.</p>	18	CO1, CO2, CO4	K1, K2, K3, K4
III	<p>a. FRUITS Classification, nutritive value, changes during ripening of fruits, enzymatic browning and methods of prevention, storage techniques.</p> <p>b. VEGETABLES Classification and nutritive value, pigments-fat-soluble, water-soluble, selection of vegetables, cooking of vegetables-changes during cooking, nutrient loss, effect of cooking on the pigments.</p>	14	CO1, CO2, CO3, CO4	K1, K2, K3, K4

IV	<p>a. MILK AND MILK PRODUCTS Composition, nutritive value, types of milk products- fermented milk products (Butter milk, Yogurt) and non - fermented milk products (Skim milk, Evaporated milk, sweetened condensed milk, Milk powder, Khoa, Ice cream).</p> <p>b. EGG Structure, composition and nutritive value, evaluation of quality of egg.</p> <p>c. MEAT Structure, composition, types of meat, cuts of meat, ageing and curing of meat, post mortem changes in meat, and tenderness of meat, meat cookery.</p> <p>d. POULTRY Composition, classification and nutritive value, poultry cookery.</p> <p>e. FISH Structure, composition, nutritive value, selection of fish, fish cookery.</p>	15	CO1, CO2, CO4, CO5	K1, K2, K3, K4
V	<p>a. FATS AND OILS Composition, types of oils, functions, rancidity, hydrogenation, winterization, smoking point and role of fat or oil in cookery.</p> <p>b. SUGAR Nutritive value, sugar related products, stages of sugar cookery, crystallization, factors affecting crystallization.</p> <p>c. SPICES AND CONDIMENTS Uses of spices in Indian cookery and medicinal properties.</p>	12	CO1, CO2, CO4	K1, K2, K3, K4
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Solar cooking method- merits and demerits. Role of Nuts and oilseeds in cookery. Criteria of selection of fruits. Role of milk in cookery. Types of spices in Indian cookery.</p>	-	CO1, CO2, CO3, CO4	K1, K2, K3, K4

Text Book

1. Potter, Norman, N., (2007), *Food Science*, (5th ed.), CBS Publications and distributors, New Delhi.
2. Shakuntala Manay, N., (2013). *Foods: Facts and Principles*, (3rd ed.), New Age International Publishers, New Delhi.
3. Swaminathan, M., (2019). *Advanced Text Book on Food and Nutrition*, Volume (2nd ed.), Bangalore Printing and Publishing Co. Ltd, Bangalore.
4. Mahatb, S., Bamji., Kamala Krishnasamy, Brahman, G.N.V., (2020) *Textbook of Human Nutrition*, (3rd ed.), Oxford and IBH Publishing Co. P. Ltd., New Delhi.

Reference Book

1. Sharma Jyoti, S., (2009). *Applied Nutrition and Food Science*. Akansha Publishing House, New Delhi.
2. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*. (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
3. Krause, M. V., Hunesher, M. A., (2013). *Food, Nutrition and Diet Therapy*. W. B. Saunders Company, Philadelphia, London.
4. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014), *Essentials of Food Science*. (4th ed.), Springer Science and Business Media, New York.
5. Avantina Sharma, (2019). *Textbook of Food Science and Technology*. (3rd ed.), CBS Publishers and Distributors.

Web References:

1. <https://www.scienceofcooking.com/>
2. https://www.brainkart.com/article/Structure-of-cereal-grains_33949/
3. <https://fruitsandveggies.org/stories/key-nutrients-that-protect/>
4. <https://pubmed.ncbi.nlm.nih.gov>
5. <https://journalofethnicfoods.biomedcentral.com>

Journals:

1. Food Science and Nutrition, John Wiley and Sons Ltd publisher, United Kingdom.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Journal of Food Science Education, Institute of Food Technologists publishing, United States.
4. Journal of the Science of Food and Agriculture, Wiley-Blackwell publishing, England.

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

MS. E. AGALYA

MS. C. NIVETHA

SEMESTER I	INTERNAL MARKS - 40		EXTERNAL MARKS - 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22UND1CC1P	FOOD SCIENCE (P)	CORE PRACTICAL	3	3

Course Objectives

- To gain knowledge in food groups.
- To compare weighing and measuring of raw and cooked food items.
- To formulate recipes by applying different cooking techniques.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO 1	Identify various food groups and cooking techniques	K1,K2,K3,K4
CO 2	Interpret weighing and measuring and compare weight of raw and cooked food items	K1,K2,K3,K4
CO 3	Prepare recipes from five food groups	K1,K2,K3,K4
CO 4	Relate cooking methods with different food groups	K1,K2,K3,K4
CO 5	Determine role of food groups in cookery	K1,K2,K3,K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	3	2	2	3
CO2	3	3	2	2	2	3	2	2	2	3
CO3	3	3	2	2	2	3	2	2	2	3
CO4	3	3	2	2	2	3	2	2	2	3
CO5	3	3	2	2	2	3	2	2	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
1.	Identification of ingredients from various food groups.	3	CO1	K1, K2, K3, K4
2.	Weighing and measuring of raw and cooked food items.	3	CO2	K1, K2, K3, K4
3.	CEREAL BASED RECIPES: Idli, Chapathi, Poori, Vermicelli upma, Kozhukattai, Aloo paratha, Rice.	3	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
4.	MILLET BASED RECIPES: Ragi Vermicelli upma, Sathumavu mix, Millet ball, Millet pongal, Millet payasam	3	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
5.	PULSE BASED RECIPES: Sundal, Bholi, Green gram payasam, Dhal makhani, Vadai, Sambar and Sprouts salad.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
6.	FRUITS BASED RECIPES: Fritters, Halwa, Salad, Milkshakes and Fresh juices	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
7.	VEGETABLES BASED RECIPES: Green leafy kootu, Avial, Stewed potato curry, Poriyal, Vegetable Salad, and Vegetable soup.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
8.	MILK BASED RECIPES: Paneer, Phirnee, Payasam, Ice cream and Basanthi.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
9.	MEATBASED RECIPES: Deep fried Chicken, Mutton gravy.	3	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
10.	FISH BASED RECIPES: Steamed fish, Fish fry, Fish gravy.	3	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
11.	EGG BASED RECIPES: Boiled, Scrambled and Poached egg, Curry and Omelette.	3	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Shakuntala Manay, N., (2013). *Foods: Facts and Principles*. (3rd ed.), New Age International Publishers. New Delhi.
2. Swaminathan, M., (2019). *Advanced Text Book on Food and Nutrition*. (2nd ed.), Bangalore Printing and Publishing Co. Ltd, Bangalore.

Reference Books

1. Vickie, A., Vaclavik Elizabeth, W., Christian, (2014). *Essentials of Food Science*, (4th ed.), Springer Science and Business Media, New York.
2. Raheena Begum, M., (2015). *Textbook of Foods, Nutrition and Dietetics*, (3rd ed.), Sterling Publishers Pvt. Ltd, New Delhi.
3. Avantina Sharma, (2019). *Textbook of Food Science and Technology*. (3rd ed.), CBS Publishers and Distributors.

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment, Demonstration and Industrial visit

Web Links:

1. <https://www.scienceofcooking.com/>
2. [https://www.nios.ac.in/media/documents/SecHmsscicour/english/Home%20Science%20\(Eng\)%20Ch-4.pdf](https://www.nios.ac.in/media/documents/SecHmsscicour/english/Home%20Science%20(Eng)%20Ch-4.pdf)
3. https://www.youtube.com/watch?v=QO_V3h14Fyc&ab_channel=SciShow
4. <https://everydaynourishingfoods.com/how-to-cook-fluffy-millets/>

Course Designers:

- Ms. E. AGALYA
- Ms. C. NIVETHA

SEMESTER I	INTERNAL MARK : 25		EXTERNAL MARK : 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND1AC1	FOOD MICROBIOLOGY	ALLIED	4	3

Course Objectives

- To acquire knowledge in relevance to microbiology and its applications in everyday life
- To learn various technique in food preservation.
- To understand the role of microorganisms in food industry and their beneficial effects.

Course Outcome and Cognitive Level Mapping

Co Number	Co Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Describe fundamental principles pertaining to food microbiology	K1,K2,K3,K4
CO2	Relate the preservation methods for the prevention of spoilage	K1,K2,K3,K4
CO3	Examine microbial quality of food and water	K1,K2,K3,K4
CO4	Interpret role of microbes in fermented food products	K1,K2,K3,K4
CO5	Illustrate benefits and hazards of micro organism	K1,K2,K3,K4

Mapping of Co with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	2	3	3	3	3	3
CO2	2	2	3	2	2	3	3	2	2	2
CO3	2	2	3	2	2	3	3	2	2	3
CO4	2	2	3	3	2	3	3	3	3	3
CO5	2	2	3	2	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. INTRODUCTION TO MICROBIOLOGY Microscope – Types and uses, classification of microorganisms – Prokaryotes and Eukaryotes.</p> <p>b. MORPHOLOGY OF MICROORGANISMS Virus, Fungi, Protozoa and Algae.</p>	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	<p>a. GROWTH AND MULTIPLICATION Growth curve, batch culture and continuous culture, chemostat and turbidostat.</p> <p>b. FACTORS AFFECTING GROWTH Intrinsic factors -nutrient content, pH, redox potential, antimicrobial barrier and water activity Extrinsic factors - relative humidity, temperature and gaseous atmosphere.</p>	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
III	<p>a. MICROBIOLOGY OF WATER Bacteriological examinations, total count, test for E – Coli and Purification of water. Modern methods of purification – Reverse Osmosis, ultraviolet purification, activated carbon.</p> <p>b. CONTROL OF MICROORGANISMS Temperature – high, low, sterilization, irradiation. Chemical agents – Disinfectant, benzoates, sorbates, propionates, acetates, nitrates, nitrites, sulphur dioxide, sulphites, pickling, addition of sugar or salt, drying.</p>	12	CO1, CO2, CO3, CO4	K1, K2, K3, K4
IV	<p>a. MICROBIOLOGY OF PERISHABLE FOODS Contamination, spoilage and preservation of vegetables and fruits, milk and milk products, meat and meat products, egg, poultry, baked products and canned products.</p> <p>b. MICROBIOLOGY OF NON - PERISHABLE FOODS Contamination, spoilage and preservation of cereal and cereal products, pulses and legumes, sugar and sugar products.</p>	12	CO1, CO2, CO4	K1, K2, K3, K4
V	<p>a. BENEFICIAL EFFECTS OF MICROORGANISMS Fermentation, Role of microorganisms in fermented foods - cheese, sauerkraut, and soy-based foods, factors controlling fermentation in foods. Probiotics and Prebiotics,</p> <p>b. HAZARDS OF MICROORGANISMS Food poisoning, food borne diseases – Salmonellosis, Botulism, Hepatitis, Amoebic dysentery.</p>	12	CO1, CO2, CO4, CO5	K1, K2, K3, K4
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Morphology of Bacteria. Difference between chemostat and turbidostat. Role of salt and sugar in control of microorganism. List the microorganism responsible for spoilage in fruits and vegetables. Benefits of food preservation.</p>	-	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Frazier William, C. (2014). *Food Microbiology*. (5th ed) McGraw Hill Irwin Companies. New York
2. Adams. (2018) *Food Microbiology*. (2nd ed). New Age International Publishers. New Delhi.
3. Pelczar Jr Michael, J. (2014) *Microbiology*. McGraw Hill Education (India) Private Ltd, New Delhi.

Reference Books

1. Sugandhar Babu R P. (2008) *Food Microbiology*. Adhyayan Publishers and distributors, New Delhi.,
2. Vijaya Ramesh k. (2007) *Food Microbiology*. (1st ed). New Age International Publishers. New Delhi.
3. Bohra and Parihar. (2012) *Food Microbiology*. Student edition, Jodhpur
4. Anathanarayan, (2013) *Textbook of Microbiology*. University Press (India) Pvt. Ltd, Hyderabad.

Web Links

1. <http://airccse.org/journal/ijscai/papers/3214ijscai01>.
2. <https://www.biologydiscussion.com/microorganisms/microbes-microorganisms/microbes-in-the-food-industry-microorganisms-biology/82587>
3. <https://www.rapidmicrobiology.com/test-method/theory-and-practice-of-microbiological-water-testing>
4. <https://academic.oup.com/femsle/article/362/20/fnv151/543071>

Journals :

1. Journal of Microbiology and Infectious Disease, Turkey .
2. Journal of Basic Microbiology, Wiley-Blackwell, Germany.
3. Journal of Microbiology, Microbiological Society Korea, South Korea.
4. Journal Applied Microbiology, Cardiff, U K.

Pedagogy:

E-content, Lecture, Power point presentation, Seminar, Assignment

Course Designers

- Ms. S. FATHIMA
- Ms. T.R. REVATHI

SEMESTER I	INTERNAL MARK : 40		EXTERNAL MARK : 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
22UND1AC2P	FOOD MICROBIOLOGY (P)	ALLIED PRACTICAL	4	3

Course Objective

- To acquire knowledge on cultivation of microorganisms.
- To isolate microorganisms from food products.
- To evaluate number of microorganisms from food products.

Course Outcome and Cognitive Level Mapping

Co Number	Co Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the instruments and their functions used for microbiological analysis	K1,K2,K3,K4
CO2	Illustrate the preparation methods of culture media	K1,K2,K3,K4
CO3	Summarize the culture media techniques	K1,K2,K3,K4
CO4	Distinguish potability of water	K1,K2,K3,K4
CO5	Evaluate microorganism responsible for spoilage in different in foods	K1,K2,K3,K4

Mapping of Co with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	2	3	2	2	3	3	2	3	3
CO2	2	2	3	2	2	3	3	2	3	3
CO3	2	2	3	2	2	3	3	2	3	3
CO4	2	2	3	2	2	3	3	2	3	3
CO5	2	2	3	2	2	3	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE
1.	Instrumentation in microbiology laboratory and their function – Microscope, Shaker, Water bath	6	CO1	K1,K2,K3,K4
2.	Instrumentation in microbiology laboratory and their function – Autoclave, Hot air oven, Laminar air flow.	6	CO1	K1,K2,K3,K4
3.	Instrumentation in microbiology laboratory and their function - Centrifuge, Calorimeter, Spectrophotometer	6	CO1	K1,K2,K3,K4
4.	Preparation of culture media.	6	CO1, CO2, CO3	K1,K2,K3,K4
5.	Prepare pure culture techniques using spread plate method	6	CO1, CO2, CO3	K1,K2,K3,K4
6.	Preparation of culture techniques using streak plate method	6	CO1, CO2, CO3	K1,K2,K3,K4
7.	Prepare pure culture techniques using pour plate method	6	CO1, CO2, CO3	K1,K2,K3,K4
8.	Staining techniques - Simple and Differential	6	CO1, CO2, CO3	K1,K2,K3,K4
9.	Microbiological analysis of water.	6	CO1, CO2, CO3, CO4	K1,K2,K3,K4
10.	Isolation of spoilage organisms from different food commodities.	6	CO1, CO2, CO4, CO5	K1,K2,K3,K4

Text Book

1. Vivek Kumar. (2011). *Laboratory manual of Microbiology*. Scientific Publishers (India)
2. Bharti Arora and D.R. Arora. (2007). *Practical Microbiology*. New Delhi CBS Publishers & Distributors.

Reference Book

1. Casida, L.E, J.R, (2012). *Industrial Microbiology*. New Age Publications. New Delhi.
2. Michael J Waites, Neil L Morgan. (2001). *Industrial Microbiology: An Introduction*. Blackwell Science Ltd. UK.
3. Rao, A.S. (2001). *Introduction to Microbiology*. Hall of India Private Ltd. New Delhi.

Web Links

1. <http://microbiologysociety.org>
2. <https://ttk.elte.hu>
3. <https://www.futurelearn.com>

Pedagogy:

Demonstration, E-content, Lecture, Power point presentation

Course Designers

- Ms. S. FATHIMA
- Ms. T.R. REVATHI

SEMESTER- II	INTERNAL MARKS: 25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND2CC2	NUTRITION THROUGH LIFE SPAN	CORE	5	5

Course Objectives

- To learn about nutritional needs of various age group.
- To enable the students to plan menu.
- To acquire knowledge on physiological changes in various stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify national nutritional guidelines for various life stages.	K1,K2,K3, K4
CO2	Describe physiological changes in various stages of life cycle.	K1,K2,K3, K4
CO3	Articulate nutritional care plan for all age groups.	K1,K2,K3, K4
CO4	Correlate nutritional strategies to combat the nutritional problems.	K1,K2,K3, K4
CO5	Plan menu according to nutritional requirements of different age group.	K1,K2,K3, K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	-	3	3	-	3	3
CO2	3	3	3	2	-	3	3	-	3	3
CO3	3	3	3	2	-	3	3	-	3	3
CO4	3	3	3	2	-	3	3	-	3	3
CO5	3	3	3	2	-	3	3	-	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a) Fundamentals of Nutrition - Basic five food groups, nutrient needs - Dietary Reference Intakes, RDA and dietary guidelines, my plate, balanced diet.</p> <p>b) Menu planning - Definition, principles of menu planning, points to be considered in menu planning, steps involved in planning menu, factors influencing meal planning.</p>	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
II	<p>a) Nutrition for Pregnancy – Physiological changes during pregnancy, stages of pregnancy, nutritional assessment and guidance in prenatal care, importance of pre and periconceptual nutrition during pregnancy, nutritional problems, complications, food and nutritional requirements, dietary guidelines.</p> <p>b) Nutrition for Lactation – Role of hormones in milk production, factors affecting the volume and composition of breast milk, role of galactogogues, food and nutritional requirements, dietary guidelines, Lactation failure and factors responsible for lactation failure.</p>	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
III	<p>a) Nutrition for Infants- Growth and development, importance of breast feeding, advantages of breast feeding, food and nutritional requirements. Weaning – definition, types of weaning and supplementary foods, points to be considered in introducing weaning foods, problems faced while introducing weaning foods, complication in infant feeding - Low birth weight , artificial feeding, special children.</p>	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4

	<p>b) Nutrition for Preschoolers – Growth and development, food and nutritional requirements, factors affecting nutritional status, low cost supplementary foods and nutritional problems among preschoolers.</p>			
IV	<p>a) Nutrition for school going children – Growth and development, food and nutritional requirements, packed lunch – factors to be considered, sample menu, school lunch programmes, nutritional problems.</p> <p>b) Nutrition for adolescent – Growth and development, body composition, puberty, secondary sexual characteristics, food and nutritional requirements, dietary guidelines, nutritional problems.</p>	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
V	<p>a) Nutrition for adulthood – Food and nutritional requirements, dietary guidelines, nutritional problems. Nutrition and work efficiency.</p> <p>b) Nutrition for Elderly –Process of ageing, food and nutritional requirements, dietary guidelines, nutrition related problems, degenerative diseases.</p>	15	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Classification of nutrients. Traditional sources of lactogogues . Points to be considered while planning packed lunch for a school going child. Physiological changes during elderly.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4,

Text Books

1. Srilakshmi ,B (2014). *Dietetics*. New Age International. New Delhi
2. Gajalakshmi ,R (2014). *Nutrition Science*. CBS Publishers and Distributors Pvt. Ltd

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder
2. Sari Edelstein (2009). *Life cycle nutrition:An Evidence- based Approach*. Jones and Bartlett Publisher.
3. Swaminathan M (2012). *Handbook of Food and Nutrition*. Bangalore Publishing Co. Ltd.
4. Gopalan.C, Rama Sastri.V.B and Balasuramanian.S.C (2020). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad.
5. Shubhangini A Joshi. (2021). *Nutrition and Dietetics*, McGraw-Hill Education (India) Pvt Limited New Delhi..5th ed
6. Ravinder Chadha and Pulkit Mathur.(2015) .*Nutrition: A Lifecycle Approach*. The orient black swan.

Web Links

1. <https://quizizz.com/admin/quiz/5fa0555b365e37001e0c688d/nutrition-through-the-lifecycle>
2. <http://213.55.90.4/admin/home/Dmu%20Academic%20Resource//Health%20Science/Nutrition%20and%20Food%20Science/2nd%20Year/Nutrition%20T>
3. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA==>
4. <https://www.fda.gov/media/135301/download>
5. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkBA==>
6. <https://egyankosh.ac.in/handle/123456789/31256>

Journals

1. Journal of Nutrition and Metabolism, Biomed central, United Kingdom
2. Pregnancy Hypertension, Elsevier B.V, Netherlands

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Group discussion.

Course Designers

Ms. S. FATHIMA

Ms. T.R. REVATHI

SEMESTER-II	INTERNAL MARKS: 40	EXTERNAL MARKS:60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND2CC2P	NUTRITION THROUGH LIFE SPAN (P)	CORE PRACTICAL	3	3

Course Objectives

- To gain knowledge on nutritive value of Indian foods.
- To understand the importance of nutrition for various stages of life cycle.
- To plan meal for various stages of life cycle.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify nutritive value of various foods	K1,K2,K3, K4
CO2	Explain the importance of RDA for various stages of life cycle	K1,K2,K3, K4
CO3	Describe the meal plan according to RDA	K1,K2,K3, K4
CO4	Interpret the nutrient content of the planned recipe	K1,K2,K3, K4
CO5	Prepare meal for various stages of life cycle	K1,K2,K3, K4

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	-	3	3	-	3	3
CO2	3	3	3	2	-	3	3	-	3	3
CO3	3	3	3	2	-	3	3	-	3	3
CO4	3	3	3	2	-	3	3	-	3	3
CO5	3	3	3	2	-	3	3	-	3	3

“1” – Slight (Low) Correlation ⇨ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation ⇨ “-” indicates there is no correlation.

SYLLABUS

LIST OF EXPERIMENT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Plan, calculate nutritive value and prepare meal for pregnant women	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Plan, calculate nutritive value and prepare meal for lactating women.	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
III	Plan, calculate nutritive value and prepare meal for an infant . Preparation of supplementary foods – Liquid, semi solid and solid.	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
IV	Plan, calculate nutritive value and prepare meal for preschooler	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
V	Plan, calculate nutritive value and prepare meal for school going children	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
VI	Plan, calculate nutritive value and prepare meal for an adolescent boy and an adolescent girl.	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
VII	Plan, calculate nutritive value and prepare meal based low, moderate and high income for an adult man and an adult women.	3	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4
VIII	Plan, calculate nutritive value and prepare meal for elderly.	6	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4

Text Books

1. Srilakshmi B (2014). *Dietetics New Age International*. New Delhi
2. Gajalakshmi R (2014). *Nutrition Science* CBS Publishers and Distributors Pvt. Ltd

Reference Books

1. Barasi, Mary E, Great Britain (2002). *Human Nutrition: Health Perspective* Hodder and Stoughton.
2. Sari Edelstein (2009). *Life cycle nutrition*. Lones and Bartlett Publisher.
3. Swaminathan M (2012). *Handbook of Food and Nutrition*. Bangalore Publishing Co Ltd
4. Gopalan.C, Rama Sastri.V.B and Balasuramanian.S.C (2016). *Nutritive Value of Indian Foods* National Institute of Nutrition (ICMR) Hyderabad

Web Links

- 1.<https://www.tarladalal.com/recipes-for-healthy-pregnancy--369>
- 2.<https://www.indianhealthyrecipes.com/indian-baby-food-recipe/>
- 3.<https://poshan.outlookindia.com/story/poshan-news-healthy-recipes-for-adolescents/361731>
- 4.<https://www.tarladalal.com/recipes-for-senior-citizen-easy-to-chew-1028>

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Group discussion.

Course Designers

- Ms.S.FATHIMA
- Ms.T.R.REVATHI

SEMESTER – II	INTERNAL MARKS – 25		EXTERNAL MARKS - 75	
COURSE CODE	COURSE TITLE	CATEGORY	HOURS / WEEK	CREDIT
22UND2CC3	MACRO AND MICRO NUTRIENTS	CORE	3	3

Course Objectives

- To gain knowledge on classification of nutrients.
- To get insight into the role of nutrients in maintaining health of the individual and community.
- To understand the inter-relationship of the various nutrients.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Identify food sources of macro and micro nutrients	K1, K2, K3, K4,
CO2	Explain inter- relationship between health and nutrition	K1, K2, K3, K4,
CO3	Predict excess and deficiency effects of various nutrients	K1, K2, K3, K4,
CO4	Interpret functions of macro and micro nutrients	K1, K2, K3, K4,
CO5	Determine water and electrolyte balance.	K1, K2, K3, K4,

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	-	3	3	-	3	3
CO2	3	3	2	2	-	3	3	-	3	3
CO3	3	3	2	2	-	3	3	-	3	3
CO4	3	3	2	2	-	3	3	-	3	3
CO5	3	3	2	2	-	3	3	-	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Introduction to Nutrition– Inter-relationship between health and nutrition. Classification of nutrients-Macro and micro nutrients.</p> <p>b. National and International recommendation for nutrient requirements- WHO, FAO, ICMR. RDA– Definition, factors affecting RDA, general principles of deriving RDA.</p>	09	CO1, CO2, CO3, CO4.	K1, K2, K3, K4
II	<p>a. Carbohydrates – Nutritional classification, functions, sources, deficiency and excess effects. Dietary Fibre – definition, Classification. physiological and metabolic effect, role of fibre in prevention of diseases.</p> <p>b. Energy Balance – Units of measurement, determination of energy value of food, components of energy requirement, measurement of total energy requirements. Energy requirement during work. Specific Dynamic Action. Basal Metabolic Rate and factors affecting BMR.</p>	09	CO1, CO2, CO3, CO4.	K1, K2, K3, K4
III	<p>a. Proteins – Nutritional classification of proteins and amino acids, functions of proteins and amino acids, sources, deficiency and excess effects. Evaluation of protein quality. (PER, BV, NPU, CS)</p> <p>b. Lipids – Nutritional classification of lipids and fatty acids, Essential fatty acids, functions, deficiency and excess effects, health benefits of omega fatty acids.</p>	09	CO1, CO2, CO3, CO4.	K1, K2, K3, K4,

<p>IV</p>	<p>a. Vitamins - Fat Soluble Vitamins (A, D, E & K) - Functions, deficiency and excess effects. Water Soluble Vitamins (B complex & C) - Functions, RDA, sources, deficiency and excess effects.</p> <p>b. Water – Definition, distribution of water, functions, requirements, sources, water balance, maintenance of water balance, distribution of electrolytes, maintenance of electrolyte balance.</p>	<p>09</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4</p>
<p>V</p>	<p>a. Minerals-Macro Minerals- (Calcium, Phosphorus, Potassium, Sodium) - Functions, sources, deficiency and excess effects.</p> <p>b. Micro Minerals (Iron, Iodine, Fluorine) - Functions, sources, deficiency and excess effects.</p>	<p>09</p>	<p>CO1, CO2, CO3, CO4.</p>	<p>K1, K2, K3, K4</p>
<p>VI</p>	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Definition of health, nutrition and nutritional status. Sources of dietary fibre. High biological value food sources. Role of water in human body. Interrelationship between nutrients.</p>	<p>-</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4</p>

Text Books

1. Swaminathan, M. (1999). *Handbook of Food and Nutrition*. Bangalore Publishing Co Ltd, Bangalore.
2. Srilakshmi, B. (2017). *Nutrition Science*. New Age International(p)ltd. New Delhi.
3. Longvah, T., Anandhan, R., Bhaskarachary, K. Venkaiah, K. (2017). *Indian Food Composition Table*. National Institute of Nutrition.

Reference books

1. Swaminathan, M. (1998). *Essentials of Food and Nutrition*. Bappco, Bangalore.
2. Vidya, Chintapalli. (1996). *Textbook of Nutrition*. Discovery Book Palace(p) Ltd, Chennai.
3. Berdanier, Carolyn, D. (2015). *Advanced Nutrition: Macronutrients, Micronutrients, and Metabolism*. Atlantic Publishers and Distributors. New Delhi.
4. Raheena Begum, M. (2009). *Textbook of Foods, Nutrition and Dietetics*. Sterling Publishers. New Delhi.
5. Martin Eastwood. (2013). *Principles of Human Nutrition*. Wiley Publishing.
6. Bamji Mahtab, S. (2017). *Textbook of Human Nutrition* (3rd ed.). Oxford & IBH Publishing Co Pvt Ltd. New Delhi.
7. Gopalan, C. (2011). *Dietary Guidelines for Indians*. Second Edition National Institution of Nutrition. Hyderabad.

Web links

1. <https://www.publichealthnotes.com/classification-of-nutrients-type-i-type-ii-macro-micro/>
2. <https://openoregon.pressbooks.pub/nutritionscience/chapter/1c-classification-of-nutrients/>
3. <https://www.medicalnewstoday.com/articles/161547#nutrition>
4. https://www.healthline.com/nutrition/protein-deficiency-symptoms#TOC_TITLE_HDR_6
5. <https://www.healthline.com/health/mineral-deficiency#What-are-the-symptoms-of-mineral-deficiency?>

Journals

1. Italian Journal of Pediatrics, Biomedical Central Ltd, Springer.
2. International Journal of Innovative Research and Reviews Erzurum, Turkey.
3. Journal of Food and Nutritional Disorders, London, United Kingdom

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar.

Course Designers

Ms. E.AGALYA

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22UND2AC3	HUMAN PHYSIOLOGY	ALLIED	4	3

Course Objectives

- To augment knowledge on anatomical perception of organs and its co-ordination with other organs.
- To study the structure of human organs.
- To understand the functions of human organs.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement On the successful completion of the course, students will be able to:	Knowledge Level
CO1.	Outline composition, functions of blood and lymphatic system	K1, K2, K3, K4
CO2.	Interpret structure and functions of organs in the body.	K1, K2, K3, K4
CO3.	Explain processes of the systems in the body.	K1, K2, K3, K4
CO4.	Discuss classification of tissue and functions of sense organs	K1, K2, K3, K4
CO5.	Evaluate structure and functions of endocrine and reproduction system	K1, K2, K3, K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	-	3	1	-	3	-	3	3	2
CO2	3	-	3	1	-	3	-	3	3	2
CO3	3	-	3	1	-	3	-	3	3	2
CO4	3	-	3	1	-	3	-	3	3	2
CO5	3	-	3	1	-	3	-	3	3	2

“1” – Slight (Low) Correlation

“2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Blood and Circulatory System</p> <p>a. Blood– Functions, Composition – Plasma, Cellular components; Red Blood Cells – Structure and functions, White Blood Cells – Types and function, Platelets. Haemoglobin – Structure and functions, Erythropoiesis, Blood coagulation. Blood groups and Rh Factor.</p> <p>b. Lymphatic System – Composition of lymph, structure and functions of lymphatic system- lymphoid tissue, lymph nodes.</p>	12	CO1, CO2, CO3	K1, K2, K3, K4
II	<p>Cardiovascular and Respiratory System</p> <p>a. Heart and Circulation- Structure of heart and blood vessels, Properties of cardiac muscle, cardiac cycle, origin and conduction of heart beat, measurement of arterial blood pressure</p> <p>b. Respiratory System- Structure and functions of respiratory system – nasal cavity, pharynx, larynx, trachea, bronchi, bronchioles, alveoli and lungs. Mechanics of Respiration, Artificial Respiration.</p>	12	CO2, CO3	K1, K2, K3, K4
III	<p>Nervous System And Sense Organs</p> <p>a. Nervous System- General classification of nervous system, Structural organization of nervous system – neuron, ganglion, neuroglia, nerves – classification - motor, sensory & mixed, structure and functions - spinal cord, brain - anatomy and functions of cerebrum, cerebellum, brain stem and medulla oblongata.</p> <p>b. Sense Organs- Structure and function of eye, ear, nose and tongue.</p> <p>c. Skin and Tissues- structure and functions of skin, tissues – classification: epithelial, connective, muscular and nervous and functions of tissue.</p>	12	CO2, CO3, CO4	K1, K2, K3, K4

IV	<p>Digestive System and Excretory System</p> <p>a. Digestive system- Anatomy, Structure and Functions of mouth, pharynx, esophagus, stomach, Small intestine and large intestine. Digestive gland – salivary, liver, gall bladder and pancreas. Digestion in the mouth, stomach and intestines. Movements of the intestine.</p> <p>b. Excretory system- Physiology of the Urinary System- kidney, nephron, ureter, urinary bladder, urethra. Composition of urine, formation of urine, micturition.</p>	12	CO2, CO3, CO4	K1, K2, K3, K4
V	<p>Endocrine and Reproductive system</p> <p>a. Endocrine System- Structure and functions of thyroid, pituitary, parathyroid, Adrenals, islets of langerhans of pancreas</p> <p>b. Reproductive System-Anatomy of the male and female reproductive organs, menstrual cycle, mammary glands, Fertilization, Development of Embryo, Pregnancy and parturition.</p>	12	CO2, CO3, CO5	K1, K2, K3, K4
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Functions of blood, Structure of heart, Basic functions of sense organs, Hunger mechanism, Amenorrhea.</p>	-	CO1, CO2, CO3, CO4 , CO5	K1, K2, K3, K4

RELATED EXPERIENCE

- Histology of Tissues – Columnar, cubical, ciliated, squamous, stratified squamous.
- Microscopic structure of organs – lungs, artery, vein, stomach, ovary, testis, uterus, pancreas.
- Histology of muscles – cardiac, striated, non –striated
- Estimation of Haemoglobin (Shali's method)
- Determination of Bleeding time (Duke method)
- Determination of Clotting time (Capillary method)
- Measurement of Blood pressure – before and after exercise
- Determination of Pulse rate – before and after exercise.
- Determination of Blood group and Rh factor

Text Books

1. Sembulingam. (2016). *Essentials of Medical Physiology*. Health Sciences Publisher. New Delhi.
2. Subramanyam., Sarada. (2018). *Textbook of Human Physiology*. S.Chand and company Ltd, New Delhi.
3. Randhawa.S.S., Atul Kabra.(2017). *Human Anatomy and Physiology-I*. S.Vikas and Company, India.
4. Muruges.N. (2010). *Anatomy Physiology and Health Education*.(6th ed.).

Reference Books

1. Guyton (2000). Guyton and Hal *Textbook of Medica Physiology*, Saunders, United States of America.
2. Waugh Anne Ross and Wilson (2003). *Anatomy and Physiology in Health and Illness*, Churchill Livingston, New York.
3. Muruges.N (2011). *Anatomy and Physiology*, Sathya Publishers, Madurai.
4. Wilson, Ross (2014). *Anatomy and Physiology in Health and Illness*, Reed Elsevier India Private Limited, New Delhi.

Journals

- 1.Human Physiology, Maik Nauka / Interperiodica Publishing, Russian Federation.
- 2.Indian Journal of Clinical Anatomy and Physiology, Innovative publication Pvt. LTD, India.
- 3.American Journal of Physiology - Endocrinology and Metabolism, American Physiological Society, United States.
- 4.Canadian Journal of Physiology and Pharmacology, Canadian Science Publishing, Nrc Research Press, Canada.

Web links

1. <https://www.khanacademy.org/science/health-and-medicine/human-anatomy-and-physiology>
2. <https://www.biologyonline.com/tutorials/the-human-physiology>
3. <https://digitaleditions.library.dal.ca/intropsychneuro/chapter/hunger-and-eating/>
4. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=NuAs6SreCGryddEfs4kkB>
[A==](#)

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Practical.

Course Designers

- Ms. B. THANUJA
- Ms. S. AGALYA

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED (IICYCLE) WITH "A" GRADE BY NAAC

ISO 9001:2015 Certified

TIRUCHIRAPPALLI

DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS



M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

Syllabus

2022-2023 Onwards

**CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS**

VISION

To strengthen and integrate academic excellence, ethical values and social responsibility to develop a healthy nation by imparting skill based knowledge, professional competency and entrepreneurial skills.

MISSION

- To have a breadth of knowledge across the subject areas of Nutrition and Dietetics.
- To professionally enrich the students for successful career in Academia, Industry and Research.
- To promote and inculcate self-reliance, social relevance, sound value system and code of professional practice among students.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR
M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS PROGRAMME

PO NO	On completion of M .Sc., Programme, the students will be able to
PO1	SCIENTIFIC MANAGEMENT AND CAREER OPPORTUNITIES Master the scientific and applied aspects of the subject for employment opportunities.
PO2	EXPLORE CREATIVITY AND INTELLIGENCE Employ novel ideas with conceptual thinking to secure self-discipline and independence to foster scientific attitude by exploration of Science.
PO3	TEAM BUILDING AND SCIENTIFIC TEMPERAMENT Inculcate training, internships and team spirit with leadership skills through academic projects and transmit complex scientific and technical information and contribute to the scientific community.
PO4	INNOVATIVE LEARNING AND TECHNOLOGICAL ADVANCEMENT Perceive research in the specialized areas and to engage in life-long learning to keep pace with emerging trends in academics, research and technology.
PO5	PERSONALITY DEVELOPMENT WITH SOCIAL RESPONSIBILITY Achieve ethical, social and holistic values with social responsibility to develop a healthy life.

PROGRAMME SPECIFIC OUTCOMES FOR
M.Sc., FOOD SERVICE MANAGEMENT AND DIETETICS

PSO NO	The Students of M.Sc., Food Service Management & Dietetics will be able to	POs Addressed
PSO1	Analyze scientific concepts in the area of Nutrition, Food Service Management and Dietetics.	PO1
PSO2	Apply critical thinking, technical skills and collaborative approach in food and nutrition, dietetics and managerial practices.	PO2, PO3
PSO3	Develop core competency skills through experimental work, internship and projects to support actions that promote social development	PO3, PO5
PSO4	Utilize local, national and global trends, emerging techniques and changes of legislation to enhance work performance.	PO4
PSO5	Establish entrepreneurial skills in designing innovative healthy food products and facility planning.	PO2, PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS), TRICHY-18
DEPARTMENT OF FOOD SERVICE MANAGEMENT AND DIETETICS
M.SC FOOD SERVICE MANAGEMENT AND DIETETICS
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
 (For the Candidates admitted from the Academic year 2022-2023 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course - I (CC)	Advanced Food Science	22PFS1CC1	6	5	3	25	75	100
	Core Course – II(CC)	Human Nutrition and Public Health	22PFS1CC2	6	5	3	25	75	100
	Core Course –III(CC)	Advanced Dietetics I	22PFS1CC3	6	5	3	25	75	100
	Core Practical - I (CP)	Advanced Dietetics I (P)	22PFS1CC1P	6	5	3	40	60	100
	Discipline Specific Elective Course-I (DSE)	A. Applied Physiology	22PFS1DSE1A	6	3	3	25	75	100
		B. Nutrition for Fitness	22PFS1DSE1B						
		C. Nutrition in Clinical Critical Care	22PFS1DSE1C						
Total				30	23				500

INTERNSHIP during Semester Holidays

II	Core Course– IV (CC)	Management in Food Service Operations	22PFS2CC4	6	5	3	25	75	100
	Core Course – V (CC)	Advanced Dietetics II	22PFS2CC5	6	5	3	25	75	100
	Core Choice Course–I (CCC)	A. Biochemistry and Metabolic Disorders	22PFS2CCC1A	6	4	3	25	75	100
		B. Food Quality Control and Regulations	22PFS2CCC1B						
		C. Front Office Operations	22PFS2CCC1C						
	Core Practical - II (CP)	Advanced Dietetics II (P)	22PFS2CC2P	6	5	3	40	60	100
	Discipline Specific Elective Course-II (DSE)	A. Functional Foods, Nutraceuticals and Nutrigenomics	22PFS2DSE2A	6	3	3	25	75	100
		B. Housekeeping and Interior Designing	22PFS2DSE2B						
		C. Food Packaging	22PFS2DSE2C						
	Internship	Internship	22PFS2INT	-	2	-	40	60	100
Extra Credit Course	SWAYAM ONLINE COURSE	As per UGC Recommendation							
Total				30	24				600

III	Core Course -VI(CC)	Food Product Development and Entrepreneurship	22PFS3CC6	6	5	3	-	100	100			
	Core Course – VII (CC)	Research Methods, Statistical Techniques and Computer Applications	22PFS3CC7	6	5	3	25	75	100			
	Core Choice Course– II (CCC)	A. Cyber Security	22PGCS3CCC2A	5	4	3	25	75	100			
		B. Food Microbiology and Sanitation	22PFS3CCC2B									
		C. Food Service Facilities	22PFS3CCC2C									
	Core Practical - III (CP)	Research Methods, Statistical Techniques and Computer Applications (P)	22PFS3CC3P	5	5	3	40	60	100			
	Discipline Specific Elective Course-III (DSE)	A. Competitive Examinations in Home Science for Professional Development	22PFS3DSE3A	5	3	2	-	100	100			
		B. Waste Management in Food Industries	22PFS3DSE3B							3	25	75
		C. Child Development	22PFS3DSE3C									
	Generic Elective Course-I (GEC)	Fundamentals of Nutrition	22PFS3GEC1	3	2	3	25	75	100			
Extra Credit Course	SWAYAM ONLINE COURSE	As per UGC Recommendation										
Total			30	24				600				

IV	Core Course– VIII (CC)	Quantity Food Production and Service	22PFS4CC8	6	5	3	25	75	100
	Core Choice Course– III (CCC)	A. Management and Accounting in Hospitality Industry	22PFS4CCC3A	6	4	3	25	75	100
		B. Techniques in Food Analysis	22PFS4CCC3B						
		C. Dietary Guidance and Counselling Skills	22PFS4CCC3C						
	Core Practical - IV (CP)	Quantity Food Production and Service (P)	22PFS4CC4P	6	5	3	40	60	100
	Generic Elective Course-II (GEC))	Community Nutrition	22PFS4GEC2	3	2	3	25	75	100
	Project	Project Work	22PFS4PW	9	5	-	-	100	100
Total			30	21				500	
Grand Total			120	92				2200	

Courses & Credits for G Science Programmes

Sl.No.	Courses	No of Courses	No of Credits	Marks
1.	Core Course -(CC)	8	40	800
2.	Core Choice Course- (CCC)	3	12	300
3.	Core Practical - (CP)	4	20	400
4.	Discipline Specific Elective- (DSE)	3	9	300
5.	Generic Elective Course- (GEC)	2	4	200
6.	Project	1	5	100
7.	Internship	1	2	100
	Total	22	92	2200

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS1CC1	ADVANCED FOOD SCIENCE	CORE	6	5

Course Objective

- To gain knowledge on nutritional composition and properties of food.
- To study the factors affecting the cooking quality of different foods.
- To develop skills to judge the quality of food.

Pre requisites

- Basic knowledge about food groups and nutritional composition.
- Fundamentals of food chemistry.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Estimate the nutritional composition of food groups	K1,K2,K3,K4,K5
CO2	Relate properties of food with processing and preparation techniques	K1,K2,K3,K4,K5
CO3	Analyze the changes that take place during cookery and factors affecting cooking quality	K1,K2,K3,K4,K5
CO4	Evaluate role of subjective and objective methods on food quality evaluation	K1,K2,K3,K4,K5
CO5	Assess importance of food additives	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	2	2	2
CO2	3	3	3	2	2	3	3	2	2	2
CO3	3	3	3	2	2	3	3	2	2	2
CO4	3	3	3	2	2	3	3	2	2	2
CO5	3	3	3	2	2	3	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. CEREALS Structure, nutritional composition- Rice, Wheat, Millets. Gluten formation, factors affecting gluten formation. Gelatinization, gelation, retrogradation, syneresis, dextrinisation. Role of cereals in cookery, problems encountered in cereal cookery. Starch – components, types of starches, modified starch.</p> <p>b. PULSES AND LEGUMES Nutritional composition, processing of pulses – soaking, germination, decortication, fermentation. Factors affecting cooking quality of pulses. Toxins in pulses.</p> <p>c. NUTS AND OILSEEDS Classification, nutritional composition, uses in cookery.</p>	18	CO1, CO2, CO3.	K1, K2, K3, K4, K5.
II	<p>a.MILK AND MILK PRODUCTS Nutritional composition, effect of physical and chemical factors on milk components, processing methods-clarification, pasteurization, homogenization. Types of milk, types of milk products- concentrated dairy products, dried dairy products, fermented milk products.</p> <p>b.SUGAR Types of sugar, physical and chemical properties of sugar, stages of sugar cookery, crystallization, factors affecting crystallization.</p> <p>c.FATS AND OILS Physical and chemical properties of fats and oils, hydrogenation, winterization, rancidity- types, prevention, flavor reversion, smoking point, thermal changes in fat, role in cookery. Absorption of fat, factors affecting absorption of fat, fat replacers.</p>	18	CO1, CO2, CO3.	K1, K2, K3, K4, K5.
III	<p>a.MEAT, POULTRY, FISH Meat-structure, types, nutritional composition, post-mortem changes, ageing, tenderization, cuts of meat, meat cookery, effect of cooking. Poultry - classification, nutritive value, selection and storage, methods of cooking. Fish- classification, nutritive value, selection and storage, methods of cooking.</p> <p>b.EGG Structure and nutritional composition, selection, storage, quality check, foam formation, factors affecting foam formation.</p>	18	CO1, CO2, CO3.	K1, K2, K3, K4, K5.
IV	<p>a.FRUIT Classification, composition, selection, storage, ripening, enzymatic browning and preventive measures.</p>	18	CO1, CO2, CO3.	K1, K2, K3, K4, K5.

	<p>b.VEGETABLES Classification, composition, selection, storage, changes during cooking, loss of nutrients while cooking, changes in plant pigments while cooking.</p> <p>c.SPICES AND CONDIMENTS Types, role in cookery, volatile compounds.</p>			
V	<p>a.EVALUATION OF QUALITY OF FOODS Sensory characteristics of food –appearance, colour, flavor, odour, taste, mouth feel. Methods of sensory analysis- Difference test, Rating test, Sensitivity test, Descriptive profile method. Requirements for conducting sensory tests. Objective methods- chemical methods, physio-chemical methods, microscopic examination, physical methods.</p> <p>b.COLLOIDAL SYSTEM Types of colloidal dispersion, properties of colloidal system, emulsion-types, stability of emulsion, emulsifiers.</p> <p>c.FOOD ADDITIVES Types - Preservatives, antioxidants, sequestrants, humectants, bleaching and maturing agents, starch modifiers, emulsifiers, stabilizers, gelling agents, thickeners and surface active agents, anti-caking agents, anti foaming agents, colouring agents, flavour enhancer, acids, bases and buffers, glazing agents.</p>	18	CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Benefits of germination. Role of sugar in cookery. Coagulation of egg protein. Uses of spices and condiments in Indian cookery. Role of food additives in food industry.</p>		CO2, CO3, CO5.	K1, K2, K3, K4, K5.

PRACTICALS

1. **Starch cookery:** Microscopic examination of different starches, gelatinization of starch.
2. **Pulse cookery:** Factors affecting the cooking quality of pulses.
3. **Milk Cookery:** Effect of heat, acid, curdling of milk.
4. **Sugar cookery:** Stages of sugar cookery
5. **Fats and Oils:** Smoking temperature, factors affecting absorption of fat.
6. **Meat, fish and poultry Cookery:** Effect of cooking methods on meat, fish, poultry.
7. **Egg Cookery:** Testing the quality of egg. Coagulation of egg white and egg yolk.
8. **Fruits:** Measures for the prevention of enzymatic browning.
9. **Vegetables:** Effect of acid , alkali and heat on pigments in vegetables.
10. **Sensory evaluation of food:** Preparation of score card and Sensory analysis.

Text Books

1. Avantina Sharma., (2012), *Textbook of Food Science and Technology*, CBS Publishers and Distributors Pvt.Ltd.
2. Singh, S. K., (2019), *Essentials of Food Science*, Ishwar Books, New Delhi, India.
3. Mohini Sethi., (2019), *Food Science Experiments and Applications*, (2nd ed.), CBS Publishers and Distributors Pvt.Ltd.
4. S.M.Reddy., (2015), *Basic Food Science and Technology*, New Age International(P) Limited, Publishers, New Delhi, India .
5. B.Srilakshmi., (2018), *Food Science*(7thed.).New Age International (P) Limited, Publishers, New Delhi, India. Edition VII.

Reference Books

1. Norman N. Potter, (2007), *Food Science*, CBS Publishers and Distributors Pvt.Ltd. Edition V
2. H.K.Chopra., (2015), *Food Chemistry*, Narosa Publishing House Pvt.Ltd.

Web References

1. <https://starch.eu/ingredients/>
2. <https://www.britannica.com/science/fat-processing>
3. <http://www.yourarticlelibrary.com/home-science/eggs/egg->
4. <https://www.who.int/news-room/fact-sheets/detail/food-additives>
5. http://samples.jbpub.com/9781449694777/9781449603441_CH03.pdf

Journals

1. Food Chemistry, Elsevier Sci. Ltd, England.
2. Food Science and Technology, Soc Brasileira Ciencia Tecnologia Alimentos, Brazil.
3. Food Research International, Elsevier Science Bv, United States.
4. Journal of Food and Agriculture, Wiley-Blackwell, England.
5. Journal of Food Science and Technology, Scientific Publishers, India

Pedagogy

Chalk and talk, PPT, e-content, Discussion, Assignment, Demo, Quiz, Seminar, Industrial visit.

CourseDesigners

1. Ms. B.THANUJA
2. MS.S.AGALYA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS1CC2	HUMAN NUTRITION AND PUBLIC HEALTH	CORE	6	5

Course Objective

- To understand the importance of meal planning.
- To comprehend the nutritional needs pertaining to different stages of life.
- To plan menu for various age groups.

Pre requisites

- Principles of nutrition and application of meal planning guidelines throughout life cycle.
- Fundamentals of community nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Infer basic sciences relevant to nutrition and apply public health principles to current public health related issues	K1,K2,K3,K4, K5
CO2	Assess the nutritional status of the population making use of the different evidence- based scientific assessment methods and protocols	K1,K2,K3,K4, K5
CO3	Interpret the impact of Nutrition policies on the health of individual as well as population	K1,K2,K3,K4, K5
CO4	Compare and contrast the health and nutritional challenges encountered in different regions and understand the various strategies employed to address them	K1,K2,K3,K4, K5
CO5	Design Nutrition Education programs for a target population using appropriate aids	K1,K2,K3,K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	2	3	3	3
CO2	2	3	3	1	-	2	2	3	3	3
CO3	2	3	2	3	-	-	2	3	3	3
CO4	3	3	3	3	-	2	2	3	3	2
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. NUTRITION AND HEALTH Inter relationship between nutrition and health. Meaning of adequate nutrition, undernutrition, and malnutrition. Principles of meal planning, Recommended Dietary Allowances (RDA)-Indian Council of Medical Research (ICMR-2010), Factors affecting RDA. Recommended Dietary Allowances and diet plan for pregnancy, lactation, infant, children's, adolescents, adults and geriatrics.</p> <p>b.PREGNANCY AND LACTATION Stages of gestation, physiological changes, weight gain, complications, factors influencing the outcome of pregnancy. Physiology of lactation - Hormonal control and reflex action, Importance of colostrum, composition of breast milk, advantages of breastfeeding, Difference between breast milk and cow's milk.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	<p>a. INFANCY, PRE-SCHOOL, SCHOOL-GOING CHILDREN AND ADOLESCENTS Growth and development of infants, preschool children, school- going children and adolescence. Artificial feeding, Breastfeeding vs. bottle feeding, Weaning and Supplementary foods, Feeding of premature infants. Factors influencing food habits of preschoolers.</p> <p>b. ADULT AND GERIATRICS Reference Man and Reference Woman, Symptoms in Menopausal and post-menopausal women. Socio-economic and psychological factors in geriatrics, Physiological changes in geriatrics, Feeding old age people. Dietary guidelines for adults and menopausal women.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
III	<p>a.EPIDEMIOLOGY Definition, aim, components, measurement in Epidemiology - IMR, NMR, MMR and tools of measurement, approach, Relation of nutrition to national development - socio-economic, industrial and agricultural development.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

	<p>b.NUTRITIONAL PROBLEMS</p> <p>PEM, Vitamin A Deficiency Diseases, Anaemia, Iodine Deficiency Disorders and Fluorosis, Synergism between malnutrition and infection.</p> <p>c. MALNUTRITION</p> <p>Definition, Ecological factors leading to malnutrition - income, size of families, dietary pattern, occupation, customs food fads, fallacies, ignorance and other factors, Classification according to grades of malnutrition.</p>			
IV	<p>a. NUTRITION INTERVENTION PROGRAMMES IN INDIA</p> <p>School Lunch Programme (SLP), Chief Minister’s Nutritious Noon Meal Program (CMNNMP), National Nutrition Mission- POSHAN Abhiyaan, Integrated Child Development Services (ICDS). National Nutritional Anaemia Prophylaxis Programme, National Prophylaxis Programme against Vitamin A Deficiency Diseases, Goitre Control Programme. National Nutrition policy- National food security, National nutrition policy- thrust areas and implementation at national level, Impact of National Nutrition policy, Sustainable Development Goals (WHO).</p> <p>b. NATIONAL AGENCIES</p> <p>Indian Council of Medical Research (ICMR), National Institute of Nutrition (NIN), National Nutrition Monitoring Bureau (NNMB), Central Food Technological Research Institute (CFTRI), Defence Food Research Laboratory (DFRL), and National Institute of Public Cooperation and Child Development (NIPCCD).</p> <p>c. INTERNATIONAL AGENCIES</p> <p>Concerned with Food and Nutrition- Food and Agricultural Organization (FAO), World Health Organization (WHO), United Nations International Children's Emergency Fund (UNICEF), World Bank.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

<p>V</p>	<p>a.NUTRITIONAL ASSESSMENT Assessing the food and nutritional problems in the community, Methods available for individual and community, Anthropometric - Measurement of height, weight, head and chest circumferences, mid upper arm circumference, skin fold thickness, interpretation of measurements and comparison with standards (NCHS, ICMR), Biochemical assessment of nutritional deficiencies, Clinical assessment of nutritional disorders and Dietary surveys-Family diet survey, individual diet survey, Quantitative diet survey, and food balance sheet.</p> <p>b.NUTRITION EDUCATION Meaning, nature and importance of Nutrition education to the community and lessons to be taught. Methods of education- use of audio-visual aids, Use of computers to impart nutrition education - PowerPoint presentation, E-learning, Organization of Nutrition education programmes: Nutrition intervention theories – Behavioural theory, Social Cognitive Theory, Health Belief Model and Meaningful learning model. Principles of planning, executing and evaluating nutrition education programmes.</p>	<p>18</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4, K5.</p>
<p>VI</p>	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Galactagogues. Eating disorders – Bulimia nervosa, Binge eating and Anorexia nervosa in adolescence. Vicious Cycle of malnutrition. Activities of World Health Organization (WHO). Problems of nutrition education programme .</p>	<p>-</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4, K5.</p>

PRACTICALS

1. Menu planning, nutritive value calculation and preparation of meals for pregnancy and lactation.
2. Menu planning, nutritive value calculation and preparation of meals for infancy, pre-school, school-going children, adolescents, adults and geriatrics.
3. Menu planning, nutritive value calculation and preparation of meals for PEM, Vitamin A, Iron and iodine deficiency.
4. Nutrition Education for pre- school and school going children.
5. Assessment of nutritional status.

Text Books

1. Brown Judith, E.(2008) *Nutrition*.(3rd ed.)Thomson Wadsworth USA.
2. Park, K. (2008) *Essentials of Community Health Nursing*(5th ed.).M/s Banarsidas Bhanot Publishers.Jabalpur.
3. Josephine Martin and Charlotte Beckett Oakley, (2008).*Managing Child Nutrition Programs*.(2nd ed.) Jones& Bartlett Publishers.
4. Seema Sonkar and Doreas L. Essiamah, (2008) *Food and Nutrition Security challenges towards combating malnutrition*.Chandralok Prakashan. Kanpur.
5. Bamji M.S, PrahladRao N, Reddy. (2016)*Textbook of Human Nutrition*.(4th ed.).Oxford and PBH Publishing Co. Pvt. Ltd. New Delhi.

Reference Books

1. Prakash Shetty,(2002).*Nutrition through the life cycle*.(1st ed.). Leatherhead publishing. Leather head International Ltd. UK.
2. Gibney, M.J.,Margetts, B.M.,Kearney, J.M.,Arab, L., (2004).*Public Health Nutrition*. (2nd ed.).UK.Blackwell PublishingCo.
3. Carolyn D. Berdanice., (2009), *Advanced Nutrition*, (2nd ed.). CRC Press.
4. M.Swaminathan., (2012), *Advanced Textbook on Food and Nutrition*. (2nd ed). Bangalore Printing and Publishing Co. Ltd., Bangalore,
5. Raheena Begum. M., (2015), *A textbook of Foods, Nutrition and Dietetics*.(3rd ed.).Sterling Publishers Pvt. Ltd., New Delhi.
6. Park K.,(2021), *Park's Textbook of Preventive and Social*.(26th ed.). M/S Banarasidas, Bharat Publishers, Jabalpur, India.

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<https://www.who.int/>
<https://www.encyclopedia.com/food/encyclopedias-almanacs-transcripts-and-maps/assessment-nutritional-status>
<https://www.fao.org/about/en/>
<https://www.nin.res.in/downloads/NNMBREPORT2001-web.pdf>
<https://www.icmr.gov.in/>

Journals

1. Society for Nutrition Education and Behavior, Elsevier Sci. Ltd, England
2. Journal of the Academy of Nutrition and Dietetics, Elsevier Science Inc publishing, United States.
3. Public Health Nutrition, Cambridge University, England
4. Food Research International, Elsevier Science Inc, United States.
5. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Demo, Quiz, Seminar, Visit to ICDS

Course Designers

1. Ms. M. VINOTHINI
2. Ms. K.S. MITHILA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS1CC3	ADVANCED DIETETICS I	CORE	6	5

Course Objective

- To plan therapeutic diets.
- To analyze the underlying causes, pathophysiology and complications of diseases.
- To outline the focus of nutrition and dietetics in the prevention of diseases.

Pre requisites

- Principles of menu planning.
- Basics of therapeutic nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Role of dietitian in the hospitals and interpret the importance of computer in nutrition practice	K1,K2,K3,K4, K5
CO2	Describe the principles of dietary counseling for various diseases.	K1,K2,K3,K4, K5
CO3	Predict the nutritional requirements and menu plans for therapeutic conditions	K1,K2,K3,K4, K5
CO4	Diagnose symptoms, causes and complications of various diseases and apply dietary modifications of therapeutic conditions	K1,K2,K3,K4, K5
CO5	Evaluate special feeding methods and psychology of the patients	K1,K2,K3,K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO 2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT I	CONTENT	HOURS	COS	COGNITIVE LEVEL
I	<p>a. DIETITIAN Definition and types of dietitians, role of dietitian in the hospital and community.</p> <p>b. COUNSELING Definition, counsellor and Client, techniques of counseling and classification of counseling.</p> <p>c. COMPUTERS IN NUTRITION PRACTICE General information – data input, data output, data analysis, data communication, clinical care – communication in patient care, Nutritional therapy.</p>	18	CO1, CO2, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a. ROUTINE HOSPITAL DIETS Clear fluid diet, full fluid diet, soft diet, Regular diet</p> <p>b. FEEDING THE PATIENTS Assessment of patient needs.</p> <p>c. SPECIAL FEEDING METHODS Enteral nutrition and Parenteral nutrition.</p> <p>d. DRUG NUTRIENT INTERACTION Diet effects on drug disposition, Interactions of drugs and nutrients, Effect of drugs on food intake and absorption, Effect of nutrients on drug metabolism.</p>	18	CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	<p>a. DIET IN FEBRILE CONDITIONS Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for febrile condition - acute, chronic and recurrent fevers- typhoid, influenza, rheumatic fever, tuberculosis, malaria and poliomyelitis.</p> <p>b. DIET CARE IN HIV Pathophysiology, stages of HIV infection, ART, opportunistic infections, women and HIV nutritional management</p>	18	CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	<p>a. DIET IN DISEASE OF GASTRO INTESTINAL TRACT Meaning, Pathogenesis, etiology, types, symptoms, treatment and dietary modification for gastro intestinal disorders – Gastritis, peptic ulcer, diarrhea, dysentery, constipation, malabsorption syndrome, and carcinoma of the stomach.</p> <p>b. DIET IN BILIARY TRACT DISORDERS</p>	18	CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	<p>Meaning, Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Liver disorders - Fatty liver, Hepatitis and Cirrhosis, Gall bladder disorders - Cholecystitis and Cholelithiasis.</p> <p>c. DIET IN PANCREATIC DISORDERS Meaning, Pathogenesis, etiology, types, symptoms and clinical findings and dietary modification for Pancreatitis</p>			
V	<p>a. DIET IN METABOLIC DISORDERS- DIABETES MELLITUS Meaning, types, screening and diagnostic criteria, pathogenesis, etiology, symptoms, complications, Dietary management of Diabetes Mellitus – Food Exchange system, Glycemic Index, Glycemic Load, nutritive and non-nutritive sweeteners. Lifestyle recommendations, drugs and insulin.</p> <p>b. OBESITY Etiology, energy balance, clinical manifestation, complications, dietary and lifestyle modifications and surgical management.</p>	18	CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Professional ethics and obligations of dietitian. Psychology of feeding the patient. Aetiology of HIV. Types of jaundice. Theories of Obesity.</p>	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mahan, Kathleen, L., Krause's, (2004). *Food, Nutrition and Diet Therapy* (11th ed.), Pennsylvania; Saunders.
2. Antia, F. P., (2005). *Clinical Dietetics and Nutrition*, (5th ed.). Oxford University Press, New Delhi,
3. Prakash Lohar, S., (2007). *Endocrinology –Hormones and Human Health*, MJP publishers, Chennai.
4. Srilakshmi, B., (2009). *Dietetics*, (2nd ed.) New Age International Publications, New Delhi.
5. Shubhangini Joshi, A., (2014), *Nutrition and Dietetics*, (5th ed.). McGraw Hill, Education Private Limited, New Delhi.
6. Swaminathan, M., (2012). *Essentials of Food and Nutrition*, Ganesh and Company, Madras.
Maity, S. P., *Pharmacology for Second Professional Students*, (6th ed.) Books & Allied Pvt. Ltd.

Reference Books

1. Robinson, Corrine, H., (1982). *Normal and Therapeutic Nutrition*, (16th ed.). Macmillan McGraw Hill School Division, New York.
2. Udai Veer, (2007). *Elements of Food Science*, Anmol Publications Pvt Ltd, New Delhi.
3. Srilakshmi, B., (2008). *Nutrition Science*, (3rd ed.). New Age International Publications, New Delhi.
4. Indrani, T.K., (2008). *Nursing Manual of Nutrition and Therapeutic Diet*, (2nd ed.). Jaypee Brothers medical publishers (P) Ltd.
5. Mary Marian, (2008). *Clinical Nutrition for surgical patients*. Jones and Barletta Publishers.
6. Sangeetha Karnik, (2010). *Nutrition and Dietetics Therapy*, Biotech Pharma Publications, Hyderabad.

Web References

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- <https://sfsurgery.com/wp-content/uploads/2014/06/Pancreatitis.pdf>
- <https://my.clevelandclinic.org/health/treatments/21098-tube-feeding--enteral-nutrition>
- <https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview>
- <https://www.mayoclinic.org/diseases-conditions/cancer/symptoms-causes/syc-20370588>

Journals

1. Food and Nutrition Bulletin, Sage Publications Inc, Japan.
2. Food and Nutrition Research, Co-Action Publishing, Sweden.
3. Food Digestion, Springer Verlag, Germany.
4. Nutrition and Cancer, Lawrence Erlbaum Associates Inc. United States
5. Nutritional Therapy and Metabolism, Wichtig Publishing, Italy.
6. Nutrition in Clinical Practice, Sage Publications Inc, United States

Pedagogy

Lecture, assignment, PowerPoint presentation, quiz, seminar, visit to hospital dietary units

Course Designers

1. Ms. S. AGALYA
2. Ms. E. AGALYA

SEMESTER I	INTERNAL MARKS: 40		EXTERNAL MARKS: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS1CC1P	ADVANCED DIETETICS I (P)	CORE PRACTICAL	6	5

Course Objective

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To study the importance of dietitian in hospitals.

Pre requisites

- Application of dietary principles.
- Planning and preparation of modified diet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Describe nutrient composition of clear fluid, full fluid and soft diet	K1,K2,K3, K4,K5
CO2	Classify foods to be included and avoided in the treatment of diseases	K1,K2,K3, K4,K5
CO3	Determine importance of dietary principles in the management of diseases	K1,K2,K3, K4,K5
CO4	Evaluate the nutritive value and plan menu for therapeutic conditions	K1,K2,K3, K4,K5
CO5	Assess various routine hospital diets	K1,K2,K3, K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT I	CONTENT	HOURS	COS	COGNITIVE LEVEL
1	PLANNING AND PREPARATION OF ROUTINE HOSPITAL DIETS Clear liquid diet, Full liquid diet, soft diet and blenderized, mechanically altered diet.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
2	PLANNING AND PREPARING DIETS FOR FEBRILE CONDITIONS Acute, Intermittent and Chronic.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
3	PLANNING AND PREPARING DIETS FOR GASTROINTESTINAL DISORDERS Peptic ulcer, Diarrhea and Constipation.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
4	PLANNING AND PREPARING DIETS FOR LIVER DISORDERS Hepatitis and Cirrhosis	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
5	PLANNING AND PREPARING DIETS FOR GALL BLADDER DISORDERS Cholecystitis and Cholelithiasis.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
6	PLANNING AND PREPARING DIETS FOR METABOLIC DISORDERS Diabetes mellitus and Obesity.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Mahan, Kathleen, L., Krause's, (2004). *Food, Nutrition and Diet Therapy*, (11th ed.) Pennsylvania; Saunders.
2. Antia, F. P., (2005). *Clinical Dietetics and Nutrition*, (5th ed.) Oxford University Press, New Delhi.
3. Prakash Lohar, S., (2007). *Endocrinology –Hormones and Human Health*, MJP publishers, Chennai.
4. Srilakshmi, B., (2009). *Dietetics*, (2nd ed.) New Age International Publications, New Delhi.
5. Shubhangini Joshi, A., (2014), *Nutrition and Dietetics*, (5th ed.). McGraw Hill, Education Private Limited, New Delhi.
6. Gopalan, C., & etal., (2018). *Nutritive Value of Indian Foods*, National Institute of Nutrition Hyderabad.

Reference Books

1. Joshi, Y. K., (2003). *Basics of Clinical Nutrition*, (2nd ed.) Jaypee Brothers, Medical Publishers, New Delhi.
2. Indrani, T.K., (2008). *Nursing Manual of Nutrition and Therapeutic Diet*, (2nd ed.) Jaypee Brothers medical publishers (P) Ltd.
3. Mary Marian, (2008). *Clinical Nutrition for surgical patients*, Jones and Barletta Publishers.

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- <https://sfsurgery.com/wp-content/uploads/2014/06/Pancreatitis.pdf>
- <https://my.clevelandclinic.org/health/treatments/21098-tube-feeding--enteral-nutrition>
- <https://my.clevelandclinic.org/health/diseases/7104-diabetes-mellitus-an-overview>

Journals

1. Food and Nutrition Research, Co-Action Publishing, Sweden.
2. Food Digestion, Springer Verlag, Germany.
3. Nutritional Therapy and Metabolism, Wichtig Publishing, Italy.
4. Nutrition in Clinical Practice, Sage Publications Inc, United States

Pedagogy

Lecture, Demonstration, Practical

Course Designers

1. Ms. S. AGALYA
2. Ms. E. AGALYA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS1DSE1A	APPLIED PHYSIOLOGY	ELECTIVE	6	3

Course Objective

- To acquire core knowledge about Cellular adaptation.
- To understand about functioning abnormality of various human systems.
- To study about the symptoms and signs of abnormal physiological functions.

Pre – requisites

- Exposure to human cell structure and function.
- Prior knowledge on human physiology

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On Successful Completion of the course, students will be able to	
CO1	Illustrate adaptation of human body to maintain homeostasis	K1,K2,K3,K4, K5
CO2	Predict physiological abnormality in different system of human body.	K1,K2,K3,K4, K5
CO3	Ascertain disease conditions associated with organs present in human body.	K1,K2,K3,K4, K5
CO4	Evaluate disease prognosis of physiological functions	K1,K2,K3,K4, K5
CO5	Conceive severity of degeneration prevalent in various organs	K1,K2,K3,K4, K5

Mapping of CO with PO and PSO

Os	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	3	2	2	3	2
CO2	3	3	2	2	2	3	2	2	3	2
CO3	3	3	2	2	2	3	2	2	3	2
CO4	3	3	2	2	2	3	2	2	3	2
CO5	3	3	2	2	2	3	2	2	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE
I	<p>GENERAL PHYSIOLOGY OF CELL AND BODY FLUIDS</p> <p>a. Cell – Action potential of cell, Cell adaptation – Atrophy, Hypertrophy, Hyperplasia, Dysplasia, Metaplasia, Cell Junction – Hereditary deafness, itchythosis, Sclerosing Cholangitis, hereditary hypomagnesmia, synovial sarcoma, Transport of membranes- Abnormalities of sodium potassium pump, ion channel disease, Mechanism of homeostatic system – Negative feed back, Positive feed back. Cell death -Autophagy, apoptosis, necrosis.</p> <p>b. Body fluids – Variation in plasma protein level, Anemia, Abnormal haemoglobin abnormal leukocytes, autoimmune disease, allergy and immunological hypersensitivity, Abnormal thrombocytes, bleeding disorders, blood volume – hypervolemia, hypovolemia. Tissue fluid- Intracellular edema, Extracellular edema, Elephantiasis.</p>	18	CO1, CO2, CO3, CO4	K1,K2,K3,K4 ,K5
II	<p>CARDIOVASCULAR AND RESPIRATORY SYSTEM</p> <p>a.Heart and Circulation –Abnormal pulse-pulses deficit, pulsusalternans, anacrotic pulse, threadypulse, pulsusparadoxus, water hammer pulse, abnormal pulse in patient ductus arterioses, abnormal pulse in aortic regurgitation, abnormal venous pulse, Arterial Blood Pressure- Hypertension, hypotension coronary artery disease, Stroke, varicose vein, thrombophlebitis, heart failure.</p> <p>b.RespiratorySystem-Apnea hyperventilation, hypoventilation, hypoxia, oxygen toxicity, hypercapnia, asphyxia, dyspnea, bronchial asthma; Infectious Diseases of Lungs-tuberculosis, pneumonia.</p>	18	CO1, CO2, CO3, CO4	K1,K2,K3,K4 ,K5
III	<p>NERVOUS SYSTEM AND SENSE ORGANS</p> <p>a.Nervous System –. Diseases of spinal cord-Syringomyelia, tabesdorsalis, multiple sclerosis, disk prolapse, effects of motor neuron lesion, paralysis, thalamic lesion, thalamic syndrome. Disorders of basal ganglia - parkinson disease, Wilson disease, chorea, athetosis, choreathetosis, Huntington chorea, hemiballisms, kernicterus. Frontal lobe syndrome, temporal lobe syndrome. Sleep Disorder, epilepsy.</p>	18	CO1, CO2, CO3, CO4	K1,K2,K3,K4 ,K5

	<p>b.Sense Organs – Eye- Glaucoma, cataract, colour blindness Conduction deafness and nerve deafness Abnormalities of taste sensation- Ageusia, hypogeusia, taste blindness, dysgeusia. Abnormalities of olfactory sensation – Anosmia, hyposmia, hypersomia</p>			
IV	<p>DIGESTIVE SYSTEM AND EXCRETORY SYSTEM</p> <p>a.Digestive system - Disorders of Upper Gastro Intestinal Tract-Hyposalivation, hypersalivation, esophageal, achalasia, gastroesophageal reflux disease(GERD), gastritis, gastric atrophy. Disorders of Lower Gastro Intestinal Tract-peptic ulcer, Zollinger -Ellison syndrome, malabsorption, Crohn's disease, celiac disease, diarrhea, constipation, appendicitis, ulcerative colitis, dysphagia, gastric dumping syndrome, vomiting. Pancreatitis, jaundice, hepatitis, cirrhosis and gallstones.</p> <p>b.Excretory system – Osmotic diuresis, polyuria, hypersecretion of Anti Diuretic Hormone, Nephrogenic diabetes insipidus, Bartter's syndrome, renal failure, Abnormalities of micturition – Atonic bladder, Automatic bladder, uninhibited neurogenic bladder, nocturnal micturition.</p>	18	CO1, CO2, CO3, CO4	K1,K2,K3,K4 ,K5
V	<p>a.Muscular and Skeletal System - Disorders of Skeletal Muscle- Myopathy-Sprain and strain, Muscular Dystrophy. Diseases involving muscle tone, Tetany Osteoporosis Arthritis, Spondylitis, Osteomalacia, Rickets, fractures</p> <p>b.Reproductive system – Effects of extirpation of testis, hypergonadism in males, hypogonadism in males, enlargement of prostate gland, azoospermia, oligozoospermia, teratozoospermia, aspermia, oligospermia, hematospermia. Abnormal menstruation – menstrual symptoms, premenstrual syndrome, anovulatory cycle, amenorrhea, hypomenorrhea, menorrhagia, oligomenorrhea, polymenorrhea, dysmenorrhea and metrorrhagia</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4 ,K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Symptoms of Anemia. Types of Hypertension. Errors of refraction. Structure and functions of Liver, gall bladder, Pancreas. Phases of Menstrual cycle.</p>	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4 ,K5

Text books

2. Wilson and Ross, (2014). *Anatomy and Physiology in Health and illness*: New Delhi Reed Elsevier India Private Limited
3. Sembulingam. K. (2016). *Essentials of Medical Physiology*: New Delhi Health Sciences Publisher.
4. Subramanyam, Sarada. (2018). *Text book of Human Physiology*: New Delhi S Chand & Company Ltd.

Reference books

1. Waugh, Anne Ross and Wilson. (2018). *Anatomy and Physiology in Health and Illness*, (13th ed). New York Churchill, Livingston.
2. Muruges N. (2011). *Basic Anatomy and Physiology*: Madurai Sathya Publishers.
3. Indu Khurana. (2013). *Textbook of Human Physiology*, Elsevier.
5. Wilson and Ross. (2014). *Anatomy and Physiology in Health and Illness*: New Delhi, Reed Elsevier India Private Limited.
6. Sembulingam. K. (2016). *Essentials of Medical Physiology*: New Delhi Health Sciences Publisher.

Web Link:

- <https://ncdc.gov.in/https://www.cdc.gov/globalhealth/countries/india/default.htm>
- <https://www.egyankosh.ac.in/handle/123456789/32973>
- https://www.google.co.in/books/edition/Applied_Physiology_Of_Exercise_Laborator/VWFEEAAAQBAJ?hl=en&gbpv=1&dq=on+line+course+material+on+applied+physiolo
- <https://www.sciencedirect.com/topics/medicine-and-dentistry/menstrual-irregularity>
- <https://ce.napnap.org/system/files/14-Musck%20Stevenson.pdf>

Journals:

- Applied Physiology, Nutrition and Metabolism, National Research Council Canada.
- Journal of Applied Physiology, American Physiological Society, United States.
- European Journal of Applied Physiology, Springer, Germany.

Pedagogy: E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers:

- Ms. S. FATHIMA
- Ms. C. NIVETHA

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDIT
22PFS1DSE1B	NUTRITION FOR FITNESS	ELECTIVE	6	3

Course Objective

- To enable students to understand the interaction between exercise and nutrient metabolism.
- To enlighten the students to understand the various physiological aspects for sportspersons.
- To help the students to understand the role of ergogenic aids to enhance sports performance.

Pre requisites

- Basic knowledge on nutrition
- Fundamentals of physiological functions of human body

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO1.	Describe the role of nutrition in fitness.	K1,K2,K3, K4,K5
CO2.	Apply the nutritional assessment techniques among individuals.	K1,K2,K3, K4,K5
CO3.	Determine the nutritional requirements for pre and post event of athletes.	K1,K2,K3, K4,K5
CO4.	Assess the ergogenic foods for sports individuals.	K1,K2,K3, K4,K5
CO5.	Appraise effect of exercise on physiological and biochemical functions.	K1,K2,K3, K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO 3	PSO 4	PSO 5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	3	3	3	2	3	3	3
CO2	3	2	3	3	3	2	2	2	3	3
CO3	3	2	3	3	3	2	2	2	3	3
CO4	3	2	3	3	3	2	2	2	3	3
CO5	3	2	3	3	3	2	2	2	3	3

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE
I	<p>INTRODUCTION TO FITNESS</p> <p>a. Understanding Fitness Definition of fitness, health and related terms, approaches for keeping fit, alternative forms of fitness- yoga, pilates, kickboxing, boot camps,</p> <p>b. Importance of Physical Activity Importance and benefits of physical activity, physical activity – frequency, intensity, time and type with example, physical activity pyramid.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
II	<p>EFFECT OF PHYSICAL FITNESS ON HEALTH STATUS</p> <p>a. Physiological and Biochemical Effect of Exercise Aerobic and anaerobic exercises, muscle contraction, weight and body composition of athletes, adaptation of muscle and body physiology to exercise.</p> <p>b. Effect of Physical Exercise on Various Systems Circulatory- Cardiovascular regulation and integration, muscular, skeletal and neural control, endocrines and exercise, respiratory systems.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
III	<p>COMPONENTS OF ASSESSMENT</p> <p>a. Assessment of Fitness Anthropometry, assessment of Cardio Respiratory Vo2 max, assessment of physical and functional capacity, hydration assessment and recommendation. Assessment of muscular fitness, muscle strength, endurance and flexibility exercise-Bench</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

	<p>jumps, pushups, sit and reach test.</p> <p>b. Nutritional Assessment</p> <p>Measurement of body composition, Somato typing, dietary assessment, biochemical assessment, clinical assessment, body composition and sports performance.</p>			
IV	<p>EFFECT OF FITNESS ON NUTRITION</p> <p>a. Importance of Nutrition</p> <p>Need and scope of nutrition in fitness, nutritional guidelines for health and fitness, goals of optimal nutrition for athletes, nutritional supplement.</p> <p>b. Nutritional Problems</p> <p>Nutritional problems in physically active persons - mineral malnutrition, athletic triad, vitamin malnutrition, eating disorders, weight concerns. The female athlete triad, eating disorders, amenorrhea, osteoporosis, travelling athletes, diabetic athletes, GI stress and athletes, cramps and stitches.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
V	<p>NUTRITIONAL GUIDELINES</p> <p>a. Nutritional Requirements</p> <p>Role of macronutrient on exercise and sports performance, Role of micronutrient on exercise and sports performance, sources of energy, Energy balance, Body mass and composition, Fuel needs for training and recovery, weight loss energy calculation.</p> <p>b. Principles of Diet Planning</p> <p>Principles of diet planning for different exercise/sports conditions, Pre game meals, Post Game meals, During meals, On-season and Off-season meals,</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

	Ergogenic aids-nutritional and non-nutritional ergogenic aids. Nutritional standards – dietary reference intake, probiotics, exercise and weight management.			
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Basics of Physical Activity Guidelines.Effect of physical exercise on digestive system. Methods of measuring energy expenditure during exercise. Government andNon-Governmental organization for sports nutrition. Role of Probiotics in Sports Nutrition.</p>	-	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

Text Books

1. Shubhangini Joshi, A.(2014). *Nutrition and Dietetics*. 5th Edition.. McGraw Hill. Education Private Limited, New Delhi.
2. Srilakshmi, B. et.al., (2017), *Exercise physiology fitness and sports nutrition*. New Age International Publishers.

Reference Books

1. Kathleen Mahan, L. (2008). *Krause's Food & Nutrition Therapy*. Sauder's Elsevier.. Canada.
2. Jose Antonio, et al., *Essentials of Sports Nutrition and Supplements*: Humana Press.
3. Wener, W.K., et al. (2009). *Lifetime Physical Fitness and Wellness: A Personalized Program* Cengage Learning, United States.
4. Jerrold, S. (2012). *Empowering Health Decisions*. Jones & Bartlett Publishers. Burlington.
5. Asker Jeukendrup, Michael Gleeson, (2019). *Sport Nutrition*: Human Kinetics. United States.

Journals:

1. Journal of the International Society of Sports, Nutrition Biomed Central Ltd, United States
2. American health & Fitness Journal, American College of Sports Medicine, 401 W. Michigan Street Indianapolis, IN 46202-3233

Web links:

1. <http://www.sportsauthorityofindia.nic.in>
2. <https://www.hhs.gov/programs/prevention-and-wellness/nutrition-and-fitness/index.html>
3. <https://www.hopkinsmedicine.org/health/wellness-and-prevention/nutrition-and-fitness>

Pedagogy: E-content, Lecture, Powerpoint presentation, Seminar, Assignment.

Course designers

- Ms. S. FATHIMA
- Ms. T.R. REVATHI

SEMESTER I	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE	CATEGORY	HRS/WEEK	CREDITS
22PFS1DSE1C	NUTRITION IN CLINICAL CRITICAL CARE	ELECTIVE	6	3

Course Objective

- To understand the special nutritional requirements in critically ill.
- To know the nutritional support system for critically ill.
- To ensure the nutritional needs of the critically ill patient

Pre requisites

- Fundamentals on nutrition and disease.
- Basic knowledge on nutritional assessment.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO 1	Explain the nutritional assessment methods	K1,K2,K3, K4,K5
CO 2	Compute principles of nutritional care	K1,K2,K3, K4,K5
CO 3	Analyze nutritional status of critically ill patients	K1,K2,K3, K4,K5
CO 4	Assess importance of enteral and parenteral nutrition	K1,K2,K3, K4,K5
CO 5	Evaluate role of nutrients in critical care	K1,K2,K3, K4,K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	2	2
CO2	3	3	3	3	2	3	3	3	2	2
CO3	3	3	3	3	2	3	3	3	2	2
CO4	3	3	3	3	2	3	3	3	2	2
CO5	3	3	3	3	2	3	3	3	2	2

“1” – Slight (Low) Correlation

“3” – Substantial (High) Correlation

“2” – Moderate (Medium) Correlation

“-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COS	COGNITIVE
I	<p>SCREENING AND NUTRITIONAL ASSESSMENT OF CRITICALLY ILL PATIENTS</p> <p>a. Screening: Diagnosis of malnutrition, Nutrition screening, Methods for nutritional screening Malnutrition Universal Screening Tool, Nutritional Risk Screening, Mini Nutritional Assessment.</p> <p>b. Assessment of Nutritional Status: Anthropometric Assessment - Body Mass Index, Mid Arm Circumference, Triceps skin fold thickness; Biochemical assessment – Urea, Creatinine, liver function tests, plasma changes in minerals, plasma protein tests; Clinical assessment – temperature, Blood Pressure, Pulse Rate; Dietary assessment – 24-hour recall method, food frequency questionnaires.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
II	<p>NUTRITIONAL CARE FOR HOSPITALIZED PATIENTS</p> <p>a. Principles of nutrition care – Nutrition care process, Progressive diets- Clear fluid diet, full fluid diet, soft and regular diet.</p> <p>b. Surgical Conditions- Hormonal response during surgery, levels of stress, starvation, sepsis, Infections, post operative diet.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
III	<p>a. Enteral nutrition – Types, routes, mode of feeding and importance, advantages and disadvantages of home-based feed, precautions while feeding and complications.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

	<p>b. Parenteral nutrition – Types, composition, importance of total parenteral nutrition, precautions while feeding and complications. Refeeding syndrome and clinical manifestations of refeeding syndrome.</p>			
IV	<p>NUTRITIONAL SUPPORT IN BURN AND TRAUMA</p> <p>a. Burns – Principles of nutrition management, Clinical effects of malnutrition and factors affecting nutritional requirements in burn patients.</p> <p>b. Trauma – Classification, Principles of nutrition management, Clinical effects of malnutrition and factors affecting nutritional requirements in trauma patients.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
V	<p>a. Renal failure –types, metabolic aspects and nutritional requirement, effects of renal treatment on nutrition and nutritional therapy.</p> <p>b. Hepatic failure – Consequences of hepatic failure upon nutritional status and nutritional support.</p> <p>c. Pulmonary diseases – types, effects of pulmonary treatment on nutrition and nutritional support.</p> <p>d. Cancer -Types of cancer, overview of nutrition in cancer care, effects of cancer treatment on nutrition and nutritional support.</p>	18	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Classification of Malnutrition. Pre operative diet in surgical condition Comparison of enteral and parenteral nutrition. Classification of burns. Types of hepatic failure.</p>	-	CO 1, CO 2, CO 3, CO 4, CO 5	K1,K2,K3, K4,K5

Textbooks

1. Luc Cynober A, Frederick Moore A., (2003), *Nutrition and Critical Care*, Karger Medical and Scientific Publishers.
2. Khanna K, Gupta S, Seth R, Passi SJ, Mahna R, Puri S., (2013), *Textbook of Nutrition and Dietetics*, Phoenix Publishing House Pvt Ltd.
2. Frederick A. Moore, Edward Abraham., (2017), *Textbook of Critical Care*, Elsevier

Reference Book

1. Verma P K., (2008), *Principles and Practice of Critical Care*, B. I Publications.
2. Pierre Singer., (2013), *Nutrition in Intensive Care Medicine: Beyond Physiology*, Karger Medical and Scientific Publishers.
3. Peter Faber, Mario Siervo., (2014), *Nutrition and Critical Care*, Cambridge University Press.
4. Rajkumar Rajendram, Victor R. Preedy, Vinood B. Patel., (2015), *Diet and Nutrition in Critical Care*, Springer New York.
5. Gail A. Cresc., (2016), *Nutrition Support for critically ill patient*, CRC Press.

Journals

1. Journal, Indian Academy of Clinical Medicine, Med IND, India.
2. Journal of the American Academy of PAs, Wolters Kluwer, United States

Web References

1. <https://www.slhd.nsw.gov.au/rpa/neonatal%5Ccontent/pdf/guidelines/tpn.pdf>
2. [https://www.clinicalnutritionjournal.com/article/S0261-5614\(20\)30194-1/fulltext](https://www.clinicalnutritionjournal.com/article/S0261-5614(20)30194-1/fulltext)
3. https://www.researchgate.net/publication/244829589_Basics_in_Clinical_Nutrition_Nutritional_support_in_trauma
4. https://nutritionguide.pcrm.org/nutritionguide/view/Nutrition_Guide_for_Clinicians/1342058/all/Burns
5. <https://www.nutritioncaresystems.com/chronic-obstructive-pulmonary-disease/>
6. <https://www.cancer.gov/about-cancer/treatment/side-effects/appetite-loss/nutrition-pdq>

Pedagogy:

E-content, Lecture, Powerpoint presentation, Seminar, Assignment

Course Designers

- Ms. M. VINOTHINI
- Ms. C. NIVETHA

SEMESTER- II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CC4	MANAGEMENT IN FOOD SERVICE OPERATIONS	CORE	6	5

Course Objectives

- To gain knowledge on principles and functions of management.
- To study the importance of tools of management.
- To familiarize process of food service management.

Pre requisites

- Principles of management.
- Tools of management.

Course Outcome and Cognitive Level Mapping

CO number	CO statement	Knowledge level
	On the successful completion of the course, students will be able to:	
CO 1	Identify commercial and non – commercial food service institutions and Managerial problems in food service establishment	K1, K2, K3, K4, K5
CO 2	Explain the principles, functions and tools of management,	K1, K2, K3, K4, K5
CO 3	Predict the significance of event management and human resource management.	K1, K2, K3, K4, K5
CO 4	Determine the methods of communication and performance appraisal.	K1, K2, K3, K4, K5
CO 5	Evaluate the role of leadership, motivation and controlling in managerial process.	K1, K2, K3, K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	3	3	3
CO2	3	3	3	2	2	3	3	3	3	3
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	3	3	2	2	3	3	3	3	3
CO5	3	3	3	2	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Food Service Institutions - Classification of food service institutions: Commercial and Non-Commercial food service institutions. Objectives and workflow.</p> <p>b. Event Management – Types of Event, role of staff, event administration, event organization, weddings, and outdoor catering (off premises catering)</p> <p>c. Food delivery system- Wireless food ordering system, Online ordering system. Software and hard ware requirements for food ordering.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a. Introduction to Management- Principles, Functions and Theories of Management –Classical , Scientific, Human relations, Behavioural Science.</p> <p>b. Tools of management-Organization Chart, job description, job specification, work schedule, job analysis, production and staff analysis statement and budget.</p>	18	CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
III	<p>a. Planning and Forecasting- Definition, Nature, steps in planning. Steps and kinds of forecasting.</p> <p>b. Organization -Definition, Process of organization, Types– Formal and Informal organization and importance of organization.</p> <p>c. Human Resource Management – Staffing, man power planning, recruitment, selection and training. Directing - Definition, characteristics and principles of directing, delegation, decentralization, centralization, supervision, authority and responsibility.</p>	18	CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
IV	<p>a. Motivation - Definition, importance, types, theories -Traditional (Fear and Punishment theory, Efforts and Rewards Theory, Carrot and Stick Theory), Modern Theories (Maslow’s hierarchy of needs theory, Herzberg’s Motivation – Hygiene theory, McClelland’s Three –Need theory, Vroom’s Expectancy theory). Approaches and techniques to enhance motivation - wages, salaries, incentives, promotion, demotion, transfer and dismissal.</p>	18	CO2, CO4, CO5.	K1, K2, K3, K4, K5

	<p>b. Leadership – Definition, Characteristics, Theories of Leadership – Trait Leadership Theory, Behavioural Theories of Leadership, Tannenbaum and Schmidt’s leadership continuum. Types of Leadership styles – Authoritarian, Paternalistic, Democratic, Laissez-faire, Expert or Functional Leader and Institutional Leader.</p>			
V	<p>a. Communication – Definition, Elements of Communication - Channels of Communication – formal and informal channel. Methods of communication – Oral, Written, Gestural, communication principles and Barriers of Communication.</p> <p>b. Controlling - Definition, characteristics and importance of controlling, techniques of control – Break Even Analysis, PERT (Programme Evaluation and Review Technique), MIS (Management Information System) and Budgetary control.</p> <p>c. Performance appraisal – Importance, methods – Traditional trait approach – Rating Scales, Ranking methods, Critical incident, Check-list methods. Appraisal by results or objects – Management by Objectives</p>	18	CO2, CO4, CO5.	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Managerial problems in food service establishment. Job specification for a Food and Beverage manager. Importance of planning in Food Service Institutions. Characteristics of Autocratic leader. Comparison of oral and written communication.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

Text books

1. Ahmed Ismail, (2004). *Front office operations and Management*. Delmar Publications, Singapore.
2. Naseem Ahmed, (2006). *Principles of Hotel Management*. Anmol Publications Pvt.Ltd.
3. Anil Bhat, Arya Kumar, (2008). *Management Principles, Processes, and Practices*, Oxford University Press
4. Vijay R. Thakur, (2007). *Food and Beverage Service*, Denetis Co
5. Premavathy N, (2008). *Principles of Management (Business Management)*, Sri Vishnu Publication.
6. Raghubalan G and Smritee Raghubalan, (2009). *Hotel housekeeping - Operations and Management*, Oxford University Press, New Delhi.
7. Mohini Sethi, (2011). *Catering management – An Integrated approach*, New Age International Pvt. Ltd. New Delhi

Reference books

1. West and B.B.Wood, (1996). *Food Service in Institutions*, Jonewiley and sons
2. Malhotra R K, (1998). *Fundamentals of hotel Management*, Anmol Publications, New Delhi.
3. Sharma Jyothi S, (2006) *Catering Management Practices*, Akansha Publishing house, New Delhi.
4. Chakravarthi B K, (2011). *Hotel and Hospitality Management*, A.P.H.Publishing corporation.
5. Anil Bhat, (2016) *Principles of Management competencies, Practices, Processes*, Oxford University Press, New Delhi.
6. Peter Jones, (2016) *Food service operations*, Library cataloguing in publishing data, London.
7. Singaravelan R, (2016) *Food and Beverage Service*, Oxford University Press, New Delhi.
8. Mamoria.C/B and Gankar.S.V, (2003), *Personnel Management, (23rd ed)*, Himalaya Publishing House.

Web Links

1. <http://ncert.nic.in/textbook/pdf/lehe104.pdf>
2. <https://pdfs.semanticscholar.org/18b8/eb1b94af18401e4610673e3f8bd6120f38fc.pdf>
3. https://nptel.ac.in/courses/122106031/slides/1_1s.pdf
4. http://shodhganga.inflibnet.ac.in/bitstream/10603/197548/5/05_chapter%202.pdfhttps://www.mamoria.gov.in/studymaterial/EC.pdf
5. <https://www.ijrte.org/wp-content/uploads/papers/v8i2S3/B11560782S319.pdf>

Journals

1. Journal of Industrial Engineering and Management, [Omnia Science](#).
2. Journal of Food Service Business Research, Taylor and Francis, United Kingdom.
3. Journal of Hotel and Business Management, Longdom Publishing, Belgium.

Pedagogy

Lecture, Assignment, Seminar, Quiz, Power point Presentation, Visit to Commercial and Non-Commercial Food Service Establishments, Internship.

Course Designers

- Ms. S.AGALYA
- Ms. B.THANUJA

SEMESTER - II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CC5	ADVANCED DIETETICS II	CORE	6	5

Course Objectives

- To analyze the underlying causes and complications of diseases.
- To understand the pathophysiology of diseases.
- To outline the focus of nutrition and dietetics in the prevention of diseases.

Pre requisites

- Knowledge in menu planning.
- Insights on therapeutic nutrition.

Course Outcome and Cognitive Level Mapping

CO Number	CO statement	Knowledge level
	On the successful completion of the course, students will be able to:	
CO 1	Determine the dietary principles in the management of various diseases.	K1,K2,K3,K4,K5
CO 2	Assess the symptoms of various diseases with clinical manifestations.	K1,K2,K3,K4,K5
CO 3	Describe mechanism of food allergy.	K1,K2,K3,K4,K5
CO 4	Classify inborn errors of metabolism.	K1,K2,K3,K4,K5
CO 5	Evaluate role of diet counseling in the nutritional Care.	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO 2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	-	3	3	3	3	3
CO2	3	3	3	3	-	3	3	3	3	3
CO3	3	3	3	3	-	3	3	3	3	3
CO4	3	3	3	3	-	3	3	3	3	3
CO5	3	3	3	3	-	3	3	3	3	3

“1” – Slight (Low) Correlation ⇨ “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation ⇨ “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Dietary Management in Cardio Vascular diseases: Pathogenesis, etiology, types, symptoms, treatment and dietary modification for cardio vascular disorders – hyper lipidaemia, hypertension, atherosclerosis, hypercholesterolemia, acute and chronic cardiac diseases, congestive heart failure and Myocardial Infarction.</p> <p>b. Dietary Management in Renal diseases: Pathogenesis, etiology, types, symptoms, treatment and dietary modification for renal disorders – glomerulonephritis, nephrosis, Acute Renal failure (ARF), Chronic Renal Failure (CRF), End Stage Renal Disease (ESRD), Dialysis. nephrolithiasis.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	<p>a. Dietary Management in Nervous System Disorders: Etiology, Clinical features and Dietary management for – Parkinson’s disease and Alzheimer’s disease</p> <p>b. Dietary Management in diseases of the musculoskeletal system: Pathogenesis, symptoms, causes, treatment and dietary management - arthritis, osteoporosis, gout and rheumatism.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
III	<p>a. Dietary Management in Hormonal diseases: Etiology, symptoms, and dietary modification for - Cushing’s syndrome, Addison’s disease, hypothyroidism and hyperthyroidism.</p> <p>b. Dietary Management in Cancer : Stages of development of cancer, etiology, metabolic alterations, symptoms, nutritional and dietary management of cancer patients, role of antioxidants in cancer treatment.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

IV	<p>a. Dietary Management for the patients with inborn errors of metabolism: Overview, diagnosis, symptoms, dietary management - Phenylketonuria, Galactosemia and Fructosuria.</p> <p>b. Dietary Management for Developmental Disabilities: Down's syndrome, Cerebral Palsy, Autism and Attention Deficit Hyperactivity Disorder</p> <p>c. Basics of Palliative care: Definition, objectives and principles of palliative care.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
V	<p>a. Dietary Management in Food allergy: Food allergy and food intolerance – Definition, mechanism, symptoms, diagnosis of allergy and dietary management.</p> <p>b. Dietary Management for patients having Metabolic stress: Surgery – Preoperative nutrition care and postoperative nutrition care. Burns – pathophysiology and medical nutrition therapy.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Complications of Dialysis. Stages of gout. Side effects of cancer treatment. Types of Palliative care. Food allergen.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

Text Books

1. Mahan Kathleen L. (2004). Krause's Food, Nutrition and Diet, Therapy, Pennsylvania Saunders.
2. Antia F P. (2005). Clinical Dietetics and Nutrition. Oxford University Press, New Delhi.
3. Prakash S Lohar. (2007). Endocrinology –Hormones and Human Health, MJP publishers, Chennai.
4. Joshi A Shubhangini. (2010). Nutrition and Dietetics. McGraw Hill Education Private Limited, New Delhi.
5. Swaminathan M. (2012). Essentials of Food and Nutrition. Ganesh and Company, Madras.
6. Maity,S.B. (2016). Pharmacology for Second Professional Students. Books & Allied Pvt.Ltd.

Reference Books

1. Robbinson,Corrine H. (1982). Normal and Therapeutic Nutrition. Macmillan McGraw Hill School Division, New York.
2. Udai Veer. (2007). Elements of Food Science, Anmol Publications Pvt.Ltd, New Delhi.
3. Indrani.T.K. (2008). Nursing Manual of Nutrition and Therapeutic Diet. Jaypee Brothers Medical Publishers Pvt.Ltd.
4. Mary Marian. (2008). Clinical Nutrition for Surgical Patients. Jones and Barletta Publishers.
5. Sangeetha Karnik. (2010). Nutrition and Dietetics Therapy. Biotech Pharma Publications, Hyderabad.
6. Sari Edelstein. (2015). Life Cycle Nutrition – An Evidence Based Approach. Jones and Barletta Publishers.

Web links

- 1.<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/heart-disease-and-foodhttp://idaindia.com/>
- 2.<https://www.omicsonline.org/societies/indian-dietetic-association/>
- 3.<https://www.frontiersin.org/journals/nutrition/sections/clinical-nutrition>
- 4.<https://www.cancer.gov/publications/dictionaries/cancer-terms/def/dietary-counseling>
- 5.<https://www.ncbi.nlm.nih.gov/pubmed/14685018>

Journals

1. Food and Nutrition Bulletin, Sage Publications Inc,Japan.
2. Food and Nutrition Research, Co-Action Publishing,Weden.
3. Food Digestion, Springer Verlag,Germany.
4. Nutrition and Cancer, Lawrence Erlbaum Associates Inc. UnitedStates
5. Nutritional Therapy and Metabolism, Wichtig Publishing,Italy.
6. Nutrition in Clinical Practice, Sage Publications Inc, UnitedStates

Pedagogy

Lecture, assignment, Power Point presentation, quiz, seminar, visit to hospital dietary units.

Course designers

- Ms.S.AGALYA
- Ms.E.AGALYA

SEMESTER- II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CCC1A	BIOCHEMISTRY AND METABOLIC DISORDERS	CORE CHOICE	6	4

Course Objectives

- To gain knowledge on the metabolism of the nutrients .
- To learn the importance of hormones and enzymes in health and diseases.
- To understand importance of organ function tests in the analysis of clinical manifestations.

Pre requisites

- Basic aspects of nutrient metabolism .
- Fundamentals of physiological functions of organs .

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	State the parameters of biochemistry in disease condition	K1,K2,K3,K4,K5
CO2	Interpret inborn diseases associated with carbohydrate, protein and fat disorder	K1,K2,K3,K4,K5
CO3	Relate importance of hormones and enzymes with diseases	K1,K2,K3,K4,K5
CO4	Illustrate compensatory mechanism in disease condition	K1,K2,K3,K4,K5
CO5	Plan appropriate technique to evaluate various organ functions	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	2	2	3	3	2	2	3
CO2	3	3	-	3	2	3	3	3	3	3
CO3	3	3	-	2	2	3	3	3	2	3
CO4	3	3	-	3	2	3	3	2	3	3
CO5	3	3	-	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation.

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>a. Biochemical Data Acquisition and Interpretation Basis for biochemical estimation of basic principles- uses of biochemical data in clinical medicine. Acquisition and interpretation of biochemical data.</p> <p>b. Detoxification Mechanism Phase one reaction – Oxidation, Reduction, Hydrolysis, Phase two – Glucuronic acid, sulfate methylation</p> <p>c. Disorders of Erythrocyte Metabolism Hemoglobinopathies, thalassemia, thrombosis</p>	18	CO1, CO2, CO3	K1,K2,K3,K4,K5
II	<p>a. Disorders of Carbohydrate Metabolism Glycohemoglobin, hypoglycemia, galactosemia and ketone bodies, Various types of glucose tolerance tests. Glycogen storage diseases. Inborn errors of carbohydrate metabolism.</p> <p>b. Disorders of Protein Metabolism Phenylalaninemia, homocystinuria, tyrosinemia, maple syrup urine diseases, Phenylketonuria, alkaptonuria, albinism and aminoaciduria. Disorders in purine/ pyrimidine metabolism.</p> <p>c. Disorders of Fat Metabolism Dyslipidemia, Atherosclerosis, Coronary Artery Disease, Disorders of lipoproteins and Steatorrhea.</p>	18	CO1, CO2, CO3	K1,K2,K3,K4,K5
III	<p>a. Disorders of Mineral Metabolism Hypercalcemia, hypocalcemia, normocalcemia, hypophosphatemia and hyperphosphatemia. Electrolytes, blood gases, respiration and acid- base balance. Disorders of acid- base balance and their respiratory and renal mechanisms.</p>	18	CO1, CO2, CO3	K1,K2,K3,K4,K5

	<p>b. Environmental Pollution and Heavy Metal Poisons</p> <p>Environmental Pollution- Corrosives, Irritants, Pesticides and insecticides, Occupational and industrial hazards, Air pollutants.</p> <p>Heavy Metal Poisons – lead poisoning, mercury poisoning, aluminium toxicity, arsenic toxicity.</p>			
IV	<p>a. Disorders of Hormone</p> <p>Protein hormones (anterior pituitary hormones, posterior pituitary hormones), Steroid hormones (Adrenocorticosteroids, Reproductive endocrinology).</p> <p>b. Clinical Enzymology</p> <p>Creatine kinase, Cardiac troponins, Lactate dehydrogenase Alanine aminotransferase, Alkaline phosphatase Prostate specific antigen Glucose-6- phosphate dehydrogenase, Amylase, Lipase, Enolase</p>	18	CO1, CO2, CO3,	K1,K2,K3,K4,K5
V	<p>a. Tissue Protein</p> <p>Collagen- Structure and synthesis, abnormal collagen, Elastin, keratin, Muscle proteins.</p> <p>b. Evaluation of Organ Function Tests</p> <p>Renal - clearance test – Urea clearance, inulin clearance and creatinine clearance, Dye test and Dilution test</p> <p>Hepatic - serum bilirubin, Icteric index, Galactose tolerance test, Hippuric acid Test and Bromsulphthalein test</p> <p>Pancreatic – Secretin stimulation test and Faecal Elastase test</p> <p>Gastric - Determination of free acidity, Fractional test, Examination of duodenal contents.</p>	18	CO1, CO2, CO5	K1,K2,K3,K4,K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Rules to be followed in biochemistry laboratory, Diabetes mellitus, Synergetic mechanism of nutrients, Anemia. Types of Jaundice.</p>	-	CO1, CO2, CO5	K1,K2,K3,K4,K5

RELATED EXPERIENCE

1. Estimation of Hemoglobin (Drabkin's method).
2. Estimation of blood glucose (Folin-Wu method).
3. Estimation of Triglycerides (Enzymatic method)
4. Estimation of Serum Calcium (Arsenzo method)
5. Demonstration of automated Biochemical Analyzer.
6. Qualitative analysis of Urine for normal constituents
7. Qualitative analysis of urine for abnormal constituents

Text Books

1. Ambika Shanmugam (2016). *Fundamentals of biochemistry for medical students* (8th ed.). Lippincott Williams and Wilkin.
2. DM Vasudevan, Sreekumari S, Kannan Vaidyanathan (2013). *Textbook of Biochemistry for Medical Students*. (7th ed) S Jaypee Brothers' medical publisher (p) Ltd.
3. Pattabiraman N.T. (2015). *Laboratory Manual Biochemistry* (4th ed.). All India Publishers and Distributors Regd Chennai.
4. Evangeline Jones (2016). *Manual of Practical Medical Biochemistry* (2nd ed.) Jaypee Brothers Medical Publishers (p) Ltd.
5. Shanmugam S, Sathish Kumar T, Panneer Selvam K (2010). *Laboratory handbook Biochemistry*. (1st ed.) PHI Learning Private Ltd. Chennai

Reference Books

1. Beckett Geoffrey (2006). *Clinical Biochemistry*. (8th ed.) Blackwell Geoffrey Publishing Australia.
2. Lajja Das (2014). *Medicinal Biochemistry*. (1st ed.). Venus Books New Delhi.
3. Murray, Robert K (2012). *Harper's Illustrated Biochemistry*. (28th ed) McGraw Hill Irwin Companies New York.

Web links

1. <https://egyankosh.ac.in/bitstream/123456789/33039/1/Unit-12.pdf>
2. <https://egyankosh.ac.in/bitstream/123456789/73108/2/Unit-11.pdf>
3. https://www.cdc.gov/nchs/data/nhanes/nhanes_99_00/lab18_met_biochemistry_profile.pdf

Journals

1. CPD Bulletin Clinical Biochemistry, Rila Publications, Ltd, United Kingdom.
2. Annals of Clinical Biochemistry, Sage Publications Inc, England
3. Clinical Biochemistry, Pergamon-Elsevier Science Ltd, Canada.
4. Indian Journal of Clinical Biochemistry, Association of Clinical Biochemists of India.
5. Journal of Clinical Biochemistry and Nutrition Japan.

Pedagogy

E-content, Lecture, PowerPoint presentation, Seminar, Assignment, Demonstration, Visit to biochemistry lab.

Course Designers

- Ms. S. FATHIMA
- Ms. K.S. MITHILA

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CCC1B	FOOD QUALITY CONTROL AND REGULATIONS	CORE CHOICE	6	4

Course Objective

- To study the importance of food regulations and quality control in food sectors.
- To understand the regulating authorities for food safety worldwide.
- To know about the regulations and quality control of food in various food industries.

Pre requisites

- To enable the students to understand the need for regulations and safety in food Industries.
- To familiarize with various food standards, laws and regulations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Infer basic laws and regulations followed in various food industries relevant to food quality	K1,K2,K3,K4,K5
CO2	Assess the safety operations involved in food systems	K1,K2,K3,K4,K5
CO3	Interpret various regulations and quality control involved in food industries	K1,K2,K3,K4,K5
CO4	Evaluate the steps of food regulation involved in the process of operations in food industries	K1,K2,K3,K4,K5
CO5	Implementation of adequate safety regulations and control at different food sectors	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	3	3	2	3	2	3	3
CO2	3	2	2	3	3	2	3	2	3	3
CO3	3	2	2	3	3	2	3	2	3	3
CO4	3	2	2	3	3	2	3	2	3	3
CO5	3	2	2	3	3	2	3	2	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction to quality control</p> <p>a) Definition of quality control, quality assurance and quality management. Quality attributes- physical, chemical, nutritional, microbial. Quality control and quality assurance- objectives, importance and functions. Methods Of Quality Control. Pre-requisite programme - Good Manufacturing Practices.</p> <p>b) Quality Council of INDIA, History, Objectives, Role of Quality Council of India, Voluntary quality standards and certification.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
II	<p>Food authority in India</p> <p>a) Food Safety and Standards Act,2006- principles to be followed- provisions as to articles of food, imported items, responsibilities of the food business operator, liability of manufacturers, packers, wholesalers, distributors and sellers. enforcement of the act – licensing and registration of food business.</p> <p>b) Food Safety and Standards Regulations,2011-food product standards and food additives, prohibition and restriction on sales, contaminants, toxins and residues. Food safety and standards regulations,2016-food or health supplements, nutraceuticals, food for special dietary uses, foods for special medical purposes, functional foods and novel food. food safety and standards regulations,2017-organic food, food recall procedure, import food safety and standards regulations,2018-packaging, fortification, advertising and claims, recognition and notification of laboratories.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
III	<p>Structure and functions of Food Authority</p> <p>a) Food safety officer and their powers, analysis of food – regulations regarding labs involved in food analysis, offences and penalties.</p> <p>b) Promoting safe and wholesome Food (Eat Right India, Food Fortification, SNF, Clean Street Food Hub, RUCO and various other social and behavioural change initiatives) training and capacity building, role of State Food Authorities.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

IV	<p>Food Safety Regulations -National and International</p> <p>a) Voluntary based products certifications- Bureau of Indian Standard (BIS), AGMARK, Consumer Protection act (1986).</p> <p>b) Government regulations (Food laws, orders) and amendments and national and international standards – ISI, FPO, codex Alimentarius, ISO. Role of FDA in India Management systems in food quality control, HACCP, TQM and concept of food audit.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
V	<p>International Organizations and Affiliations in Quality control</p> <p>a) Codex Alimentarius-History, operations of Codex Alimentarius (Members, Standard setting and Advisory mechanisms).World Trade Order – Functioning and responsibilities,WTO agreements (SPS/TBT). responsibilities, codex standards and maximum residue limits, current issues under consideration – SPS (Sanitary and phytosanitary measures) agreement.</p> <p>b) Food Labelling- Need for labelling, developing labelling standards at the world level, limitations of labelling safety issues, labelling regarding methods of processing, products derived from modern biotechnology and irradiated product, organic product, genetically modified foods, EU rules and US rules on nutritional labelling, health claims – Approach of US and EU.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Principles of quality control, Hygienic practices to be followed by food handlers, Role of Food safety officer, Functions of AGMARK, Overview of Codex Alimentarius.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5

Text Books

1. Adams., M.R Moss. M.O. (2015), *Food Microbiology*, New Age international(P)ltd, Publishers, New Delhi.
2. Subbulakshmi, G, Shobha A Udipi., (2006), *Food Processing and Preservation*, New Age international Publishers, New Delhi, 1st ed.,
3. Roday S., (2008), *Food Hygiene and Sanitation*, Tata McGraw Hill publishing company ltd, New Delhi.
4. Frazier, W.C., (2000) *Food Microbiology*, New Age international(P)ltd, Publishers, New Delhi.

Reference Books

1. Kees A. van der Heijden and Sanford Miller., (1999), *International Food Safety Handbook: Science, International Regulation, and Control*. Published by CRC Press. ISBN 0824793544, 9780824793548.
2. Neal D. Fortin., (2016). *Food Regulation Law, Science, Policy, and Practice*. Wiley
3. Hui, Y.H., (2003). *Food Plant Sanitation*, Marcel Dekker, Inc.
4. Potter N, and Hotchkiss J.H (2008) *Food Science*. CBS Publications and Distributors, New Delhi
5. Srilakshmi B., (2016). *Food Science*. New Age International Publishers, New Delhi

Web References

- 1.<http://www.eolss.net>
- 2.<https://www.fssai.gov.in/home>
- 3.http://www.fao.org/trade/docs/LDC-foodqual_en.htm
4. http://www.fao.org/ag/agn/agns/capacity_elearning_codex_en.asp
- 5.<http://www.eufic.org/index/en/>
- 6.<http://foodsafety.unl.edu/haccp/start/physical.html>
7. <http://www.codexalimentarius.net>
8. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=Cdnwi2LUCCLzrJZ76d/o1A==>

Journals

1. Journal of Packaging Technology and Research. Springer Nature, Switzerland.
2. Food Packaging and shelf life, Elsevier Science Inc, United States.
3. Emirates journal of Food & Agriculture, United Arab Emirates university, UAE

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar.

Course Designers

- Ms. T.R. REVATHI
- Ms. B. SIVA VAISHNAVI

SEMESTER -II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CCC1C	FRONT OFFICE OPERATIONS	CORE CHOICE	6	4

Course Objectives

- To gain knowledge on role of front office as functional area.
- To understand the functions of front office.
- To study the operational aspects of front office.

Pre requisites

- Fundamentals of hotel functional areas.
- Basics of front office operations.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Illustrate operations of hospitality sector	K1,K2,K3,K4,K5
CO2	Classify hotels on the basis of various criteria	K1,K2,K3,K4,K5
CO3	Explain functionalities of all departments in the industry	K1,K2,K3,K4,K5
CO4	Device strategies for the profitability of the hotel	K1,K2,K3,K4,K5
CO5	Plan for check in and check out of guest	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

Cos	SO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	-	3	3	3	3	-	3	3
CO2	3	3	-	3	3	3	3	-	3	3
CO3	3	3	-	3	3	3	3	-	3	3
CO4	3	3	-	3	3	3	3	-	3	3
CO5	3	3	-	3	3	3	3	-	3	3

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation →

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Hotel Industry Hotel - Definition, Classification based on star Category, size and location. Hotel Organization - Organization Pattern in a large, medium and small sized hotel. Functional Department in a hotel –Front office, Housekeeping, Reservations, Night audit, Loss / Prevention, Security , Food and beverage. Engineering and Sales departments.</p>	18	CO1, CO2	K1,K2,K3,K4,K5
II	<p>The Guest and Guest Rooms Categorizing the guest room - Room types, Room configuration, Room Designations, Room Numbering, Room status reconciliation, Key control systems ..</p>	18	CO1, CO2.	K1,K2,K3,K4,K5
III	<p>Room Rates , Room Rate Designations and Reservation Rack rate, Corporate rate Volume account rates, Government rate, seasonal rates weekday / Weekend rates, membership rates, Industry rates, Walk in rates, Premium rates, half day rates, Advance Purchase rates, Package rates, Per person rates, group rates. Reservations – Determining occupancy and availability, Availability factors overselling and procedure.</p>	18	CO1, CO2, CO3.	K1,K2,K3,K4,K5
IV	<p>Front Office Overview The Arrival Chronology - Greeting, Transition, Registration and Completion – Group arrivals. Departure - Front desk Checkout, Guest directed Computer checkout, Automated checkout. Front office operations - Communications, staffing Values added Services – safe deposit boxes, Mail, Telephone and document handling. The Electronic Front Office (EFO).</p>	18	CO1, CO2, CO3, CO4, CO5	K1,K2,K3,K4,K5
V	<p>Guest Accounting and Night Audit Guest Accounting - Accounting basics, Guest history account – Guest Ledger ,City ledger , Accounting entries. Night Audit - Night audit overview, Night audit reporting, Ancillary Night audit duties.</p>	18	CO3, CO4, CO5.	K1,K2,K3,K4,K5

VI	SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Pod hotel. Functioning of lost and found. Point of Sale System. Property Management System. Software and apps used for Reservation.	-	CO1, CO2, CO3, CO4, CO5.	K1,K2,K3,K4,K5
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Text Books

1. Ahmed Ismail. (2004). *Front office operations And Management*. Delmar Publications
2. Sudhir Andrews.(2014). *Hotel Front Office a Training Manual*, (3rd edition) McGraw Hill Education(India) Private Limited.
3. Dr. B.K.Chakravarthi.(2011). *Hotel Front Office Training Manual*, A.P.H Publishing Corporation.
4. R.K. Arora.(2009).*Hotel Organization And Front Office Management*.A.P.H Publishing Corporation.

Reference Books

1. Ahmed Ismail. (2004).*Front office operations And Management*. Delmar Publications.
2. Kyesung chon and Raymond . T.Sparrowe. (2001).*Welcome to Hospitality An Introduction*(2nd ed) Delmar publication.
3. G.Raghubalan, Smritee Raghubalan, *Hotel Housekeeping operations an Management*, Oxford University Press.
4. Tarachand.(2000). *Hotel and Restaurant Management*. Mohit Publications. New Delhi.
5. S.K. Bhatnagar(2005) *Front Office Management*, Frank Bros.& Co.(Publishers) Limited.
6. Ravi Aggarwal (2010). *Hotel Front Office – Systems & Procedures*, sublime publications.
7. M.A. khan.(2005).*Front Office*.Anmol Publication Private Limited.

Web Reference

1. <https://www.ihmnotessite.net/hotel-core-areas>
2. <https://www.ihmnotessite.net/classification-of-hotels>
3. <https://www.ihmnotessite.net/types-of-rooms>
4. <https://www.ihmnotessite.net/fo-organisation>
5. https://www.bharatskills.gov.in/pdf/E_Books/FrontOffice1Sem_TP.pdf
6. <file:///C:/Users/Lenovo/Downloads/BHM-704ET.pdf>

Journals

1. The Journal of Hospitality & Tourism Research, Sage Publication.
2. The Journal of Hospitality & Tourism Research,

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Group discussion.

Course Designers

- Ms.S.FATHIMA
- Ms. B. SIVA VAISHNAVI

SEMESTER- II	INTERNAL MARKS: 40	EXTERNAL MARKS: 60		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2CC2P	ADVANCED DIETETICS II (P)	CORE PRACTICAL	6	5

Course Objectives

- To understand the modification of normal diet for therapeutic purpose.
- To acquire the skills of preparing diet for various disease conditions.
- To able to counseling therapeutic approaches.

Pre requisites

- Application of dietary principles.
- Planning and preparation of modified diet.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Illustrate the importance of therapeutic nutrition.	K1,K2,K3,K4,K5
CO2	Classify foods to be included and avoided in the treatment of diseases.	K1,K2,K3,K4,K5
CO3	Determine the dietary principles in the management of diseases.	K1,K2,K3,K4,K5
CO4	Evaluate nutritional status before planning menu.	K1,K2,K3,K4,K5
CO5	Appraise the developed tools for diet counseling.	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	2	3	3	3	3	3
CO2	3	3	3	3	2	3	3	3	3	3
CO3	3	3	3	3	2	3	3	3	3	3
CO4	3	3	3	3	2	3	3	3	3	3
CO5	3	3	3	3	2	3	3	3	3	3
	3	3	3	3	-	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

LIST OF EXPERIMENTS	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Planning and preparing diets for Cardio vascular disorders – Hypertension and Atherosclerosis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	Planning and preparing diets for Renal disorders –Acute Renal Failure, Chronic Renal Failure, Renal Stones and Dialysis.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
III	Planning and preparing diets for Musculoskeletal Disorders –Gout, Arthritis, Osteoporosis.	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
IV	Planning and preparing diets for Hormonal diseases - hypothyroidism and hyperthyroidism.	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
V	Planning and preparing diets for Cancer.	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
VI	Diet counseling for <ul style="list-style-type: none"> ● Febrile conditions. ● Gastrointestinal disorders. ● Liver disorders. ● Metabolic disorders. ● Cardio vascular disorder. ● Renal disorders. 	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

Text Books

1. Mahan Kathleen L. (2004). Krause's Food, Nutrition and Diet, Therapy, Pennsylvania Saunders
2. Srilakshmi,B. (2009). Dietetics. New Age International Publications, New Delhi.

Reference Books

1. Indrani.T.K. (2008). Nursing Manual of Nutrition and Therapeutic Diet. Jaypee Brothers Medical Publishers Pvt.Ltd.
2. Sangeetha Karnik. (2010). Nutrition and Dietetics Therapy. Biotech Pharma Publications, Hyderabad.

Pedagogy

Lecture, Demonstration, Practical.

Course designers

- Ms.S.AGALYA
- Ms.E.AGALYA

SEMESTER -II	INTERNAL MARKS: 25	EXTERNAL MARKS:75		
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2DSE2A	FUNCTIONAL FOODS, NUTRACEUTICALS AND NUTRIGENOMICS	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objective

- To acquire a sound understanding of the sources of functional foods and nutraceuticals
- To learn role of functional foods and nutraceuticals in health and diseases.
- To understand the concept of nutrigenomics.

Pre requisites

- Fundamentals of food science.
- Basic knowledge on nutrition and dietetics.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and classify functional foods and nutraceuticals	K1,K2,K3,K4,K5
CO2	Explain the techniques used for extracting functional food components from food sources	K1,K2,K3,K4,K5
CO3	Evaluate the isolated component derived from the functional food	K1,K2,K3,K4,K5
CO4	Illustrate mechanism of action of functional foods and nutraceuticals on health and disease	K1,K2,K3,K4,K5
CO5	Interpret the interactions between functional foods and nutrigenomics	K1,K2,K3,K4,K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	-	2	2	3	3	3	3	2
CO2	3	3	-	3	3	3	3	3	3	3
CO3	3	3	-	3	3	3	3	3	3	3
CO4	3	2	-	3	3	3	3	3	3	3
CO5	3	2	-	2	2	2	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Functional Foods and Nutraceuticals Definition, Classification of functional foods based on Food source - Plant, animal, microbial. Mechanism of action - antioxidant, antibiotic, anti-inflammatory, antitumor, antihypertensive. Chemical nature - Fatty acids and structural lipids, saponins, isoflavones, phenolic substances, terpenoids, tocotrienols and simple terpenes, Isoprene derivatives, Amino acid derivatives, Carbohydrate derivatives.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	<p>Role of Functional Foods and Nutraceuticals on Health from Plant Sources: Cereals and its Products – rice bran, wheat bran, oats, barley, corn. Pulses and its Products – grams, bean, soyabean. Vegetables and Fruits – GLV, cruciferous vegetables, carrot, tomato, avocado, berries. Nuts and Oilseeds – flax seeds, walnut, almond Herbs – thyme, aloe vera, mint Roots and tubers – Ginger, sweet potato, cassava Spices and Condiments – turmeric, red chilli, nutmeg, cloves, cardamom</p> <p>Role of Functional Foods and Nutraceuticals on Health from Animal Sources: Meat – Liver, Country chicken Fish- tuna fish, mackerel, sardines and salmon Egg – Country egg</p> <p>Role of Functional foods and nutraceuticals on health from microbial source: Probiotic microflora, prebiotics, symbiotics</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

<p>III</p>	<p>Role of Functional Foods and Nutraceuticals in Diseases : Diabetes mellitus, Hypertension, Ulcer Osteoporosis, Cancer, Obesity and Stress.</p> <p>Role of Functional Foods and Nutraceuticals in Disorder : Hypercholesterolemia, Neurological disorders Nephrological disorders, Liver disorders</p>	<p>18</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4, K5.</p>
<p>IV</p>	<p>Isolation and Extraction Functional Component from Plant and Animal Materials: Extraction methods- Extraction of phenolic compounds using solvents, Microwave- assisted Extraction, Ultrasonic – assisted Extraction. Recent developments in the isolation, purification and delivery of phytochemicals.</p> <p>Regulatory Aspects of Functional Foods and Nutraceuticals Regulatory aspects- CODEX, DSHEA, FOSHU, FSSAI, AYUSH, development of biomarkers to indicate the of functional ingredients, Research frontiers in functional foods.</p>	<p>18</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4, K5.</p>
<p>V</p>	<p>Nutrigenomics Basic concepts of Genomics and Functional Genomics, Proteomics, Metabolomics, Epigenetics and Personalized nutrition. Nutrients and gene expression with its regulation. Scope and Importance to Human Health and Industry, Transporter gene polymorphisms -interaction with effects of macro and micronutrients in humans. The intestinal microbiota - role in nutrigenomics. Nutrigenomics approaches to unraveling physiological effects of complex foods.</p>	<p>18</p>	<p>CO1, CO2, CO3, CO4, CO5.</p>	<p>K1, K2, K3, K4, K5.</p>

	<p>Modifying Disease Risk through Nutrigenomics</p> <p>Modulating the risk of diseases through Nutrigenomics – Cardiovascular disease, Diabetes, Cancer, Inflammatory bowel disease, Obesity.</p>			
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination) Difference between functional Foods and nutraceuticals. Sources of functional foods. Role of functional foods in Psoriasis. Regulatory aspects of FDA. Proteomics</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

Text Books

1. Chavan,U.D. (2017) *Nutraceutical Functional Foods – Volume I*. Daya Publishing House, New Delhi.
2. Chavan,U.D. (2017) *Nutraceutical Functional Foods– Volume II*. Daya Publishing House, New Delhi.

Reference Books

1. Pomeranz,Y (2000). *Food Analysis Theory and Practice*. CBS Publishers & Distributors Pvt.Ltd, New Delhi.
2. Edward.R,Farnworth (2008). *Handbook of Fermented Functional Foods*. CRC Press. Newyork.
3. Medwin Gale (2018). *Nutrigenomics*. Random Publications, New Delhi.
4. Wildman,E.C Robert(2007). *Handbook of Nutraceuticals and Functional Foods*(2nd ed). CRC press.

Web Links

1. <https://www.nutritionociety.org/blog/nutrigenomics-basics>
2. https://faculty.ksu.edu.sa/sites/default/files/lectute_1_457_0.pdf
3. <https://egyankosh.ac.in/bitstream/123456789/38355/1/Uint-9.pdf>

Journals

1. Functional foods in Health and Disease, Functional food centre, Unitedstates
2. Future journal of pharmaceutical sciences, Elsevier,UnitedKingdom
3. Nutrafoods, Springer, UnitedStates.
4. Functional Foods in Health and Disease, Functional Food Center, Inc.UnitedStates.
5. International Journal of Bio-Resource and Stress Management

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment, Quiz, Group Discussion

Course Designers

- Ms.M.VINOTHINI
- Ms.S.FATHIMA

SEMESTER- II	INTERNAL MARKS:25		EXTERNAL MARKS:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
22PFS2DSE2B	HOUSEKEEPING AND INTERIOR DESIGNING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To gain knowledge on the role of housekeeping departments in hospitality sector.
- To acquire skill in aspects of interior design.
- To understand the types of rooms and cleaning procedures.

Pre requisites

- Basic knowledge about food service establishments.
- Principles and elements of interior design.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Knowledge Level
	On the successful completion of the course, students will be able to	
CO 1	Identify the concept, scope and importance of housekeeping and interior design in food service establishments	K1, K2, K3, K4, K5
CO 2	Illustrate the layout of establishment and styles of interior design	K1, K2, K3, K4, K5
CO 3	Interpret and apply the functions of housekeeping and interior design	K1, K2, K3, K4, K5
CO 4	Examine the selection and maintenance of cleaning equipment	K1, K2, K3, K4, K5
CO 5	Develop skill in the field of housekeeping and interior design	K1, K2, K3, K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	2	2	3	3	3	3	3
CO2	3	3	3	3	2	2	2	2	2	2
CO3	3	3	3	2	2	3	3	3	3	3
CO4	3	3	3	3	2	2	3	2	3	3
CO5	3	3	3	3	2	3	3	3	3	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Housekeeping Overview</p> <p>a. Housekeeping- Objectives, qualities and etiquette of housekeeping staff. inter and intra departmental co-ordination, role of housekeeping in hospitality and food service establishment</p> <p>b. Housekeeping procedures- Briefing, debriefing, gate pass indenting from stores- inventory of housekeeping items, housekeeping control desk, importance, check list, key control, handling lost and found, forms, formats and registers used in the control desk, paging systems and methods, handling of guest queries, problem, request, general operations of control desk, role of control desk during emergency.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
II	<p>House Keeping Organization and Layout</p> <p>a. Organization - Structure of housekeeping department, job description of housekeeping personnel. operational areas of housekeeping department, sequence of housekeeping functions</p> <p>b. Layout- Types of guest rooms, layout of guest room, corridor and floor pantry.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
III	<p>Linen Rooms and Laundry and Cleaning Science</p> <p>a. Linen Room and Laundry - Linen, Uniform, Bedding, Linen- storage and control, Table linen, bed linen, bedding, bed making and turning down, uniforms, and fabric stain removal. Laundry – Commercial, in-house,</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5

	<p>linen hire, laundry process. Uniform designing: Importance, types, characteristics, selection, par stock, Function of Tailor room.</p> <p>b. Cleaning science- Daily cleaning of Occupied, Departure, Vacant, Under repair, VIP rooms. Cleaning agent -types and characteristics. Stain removal Techniques. Cleaning equipment -types, Selection and care and maintenance.</p>			
IV	<p>Elements and principles of Interior Design</p> <p>a. Interior design- Importance of interior design. Design – definition, types. Elements – line, direction, shape, size, texture and colour. Principles- harmony, balance, rhythm, emphasis, proportion.</p> <p>b. Color –color dimensions– hue, value and intensity, color therapy and psychology. Color systems, applications of color in interior and exterior.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
V	<p>Accessories in Interior Design</p> <p>a. Accessories-meaning, types-functional, decorative. Importance of lighting, sources, types, glare- its types, causes and prevention. Styles of furniture – traditional, contemporary and modern design. Furniture for different purpose, furnishing materials. Selection, use and care of furnishing materials.</p> <p>b. Window Treatment - draperies, curtains type and uses.</p> <p>c. Flower arrangement- requirements, care of flowers, types and styles of flower arrangements.</p>	18	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5

VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Difference between job description and job specification.</p> <p>Role of housekeeping department in a hotel.</p> <p>Activities of the linen room.</p> <p>Color harmony.</p> <p>Types of flower holders.</p>	-	CO 1 CO 2 CO 3 CO 4 CO 5	K1, K2, K3, K4, K5
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Text Books

1. G. Raghubalan and Smritee Raghubalan, 2015, *Hotel Housekeeping: Operations and Management*, 3rd Edition, Oxford University Press.
2. Marilynne Robinson, 2015, *Housekeeping*, Faber & Faber Publishers.
3. Gary Gordon & Jamco L. Nuckolls, 2004, *Interior lighting for Designers*, 3rd edition, John Wiley & Sons, New York.

Reference Books

1. Allen Tate, 2005, *The making of interiors – An introduction*, - Harper & Row Publishers, New York.
2. Simon Dodsworth, 2009, *The Fundamentals of Interior Design*, Bloomsbury Academic Publishers.
3. Malini Singh, 2012, *Hotel Housekeeping*, Tata McGraw Hill Education.
4. Joan Cameron Branson, Margaret Lennox, 1988, *Hotel, Hostel and Hospital Housekeeping*. Edward Arnold Publishers.

Journals

1. Journal of Interior design research and education
2. International Journal of Transformation in Tourism & Hospitality Management
3. Journal of Interior Design

Web links

1. <https://www.emerald.com/insight/content/doi/10.1108/ijchm.2000.12.3.218.3/full/html>
2. <https://www.cleanindiajournal.com/category/professional/housekeeping/>
3. https://www.etsy.com/market/housekeeping_journal
4. <https://idec.org/journal-of-interior-design/>
5. <https://matjournals.com/Journal-of-Interior-Designing%20and-Regional-Planning.html>
6. <https://epgp.inflibnet.ac.in/Home/ViewSubject?catid=Cdnwi2LUCCLzrJZ76d/o1A==>
7. <https://egyankosh.ac.in/simple-search?query=housekeeping>

Pedagogy

E-content, Lecture, Power point presentation, Seminar, Assignment.

Course Designers

- Ms. T.R. REVATHI
- Ms. C. NIVETHA

SEMESTER- II	INTERNAL MARKS: 25		EXTERNAL MARKS: 75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2DSE2C	FOOD PACKAGING	DISCIPLINE SPECIFIC ELECTIVE	6	3

Course Objectives

- To study about the functions of packaging along with the influence of various factors on food.
- To know about the different packaging materials, their manufacturing process and equipment.
- To study about the various methods of packaging to improve the shelf life of the products.

Pre requisites

- Basics in food science and food chemistry concepts.
- Fundamentals of food safety and laws.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Infer basics in relevant to food packaging, materials and equipment	K1, K2, K3, K4, K5
CO2	Assess the different types and properties of the food packaging materials and equipment	K1, K2, K3, K4, K5
CO3	Understand packaging properties, rules and packaging techniques	K1, K2, K3, K4, K5
CO4	Describe the packaging materials and effective packaging processes	K1, K2, K3, K4, K5
CO5	Interpret food standard and laws to emphasize the importance of food safety with packaging aspects	K1, K2, K3, K4, K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	1	3	3	3	3	3	3	3
CO2	2	3	1	3	3	3	3	3	3	3
CO3	3	2	1	3	3	2	3	3	3	3
CO4	2	2	1	3	3	2	2	3	3	3
CO5	2	2	1	3	3	2	2	3	3	3

“1” – Slight (Low) Correlation → “2” – Moderate (Medium) Correlation

“3” – Substantial (High) Correlation → “-” indicates there is no correlation.

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	<p>Introduction to food packaging Objectives, functions of packaging, requirement of effective packaging. Forms of Packaging – rigid, semi-rigid, flexible. Packaging closures and sealing systems, analysis of storage requirement, Vacuum and Inert gas Packaging. Tests on packaging materials, mechanical strength, tension, notch and tearing strengths.</p>	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5.
II	<p>Materials used for food packaging Types, properties, advantages and disadvantages- Paper and paper-based Packaging materials, metal packaging materials, glass packaging materials, plastics and composites, edible and biodegradable, nano food packaging materials. Selection and Design of packaging, Material for dehydrated foods, frozen foods, dairy products, fresh fruits & vegetables, meats and sea foods.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
III	<p>Packaging material properties Properties of packaging materials such as tensile strength, bursting strength, tearing resistance, puncture resistance, impact strength, tear strength, methods of testing and evaluation; barrier properties of packaging materials, theory of permeability, factors affecting permeability, permeability coefficient, gas transmission rate and its measurement, water vapor transmission rate and its measurement.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
IV	<p>Packaging equipment and machinery Active packaging, Modified atmosphere packaging, aseptic packaging, packages for microwave ovens, tetra pack unit Biodegradable plastics, edible gums, coatings vacuum machine; gas packaging machine, seal and shrink packaging machine, form and fill sealing machine, aseptic packaging systems, bottling machine, carton making machine, retort pouches, package printing machines.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

V	<p>Safety and legislative aspect of packaging</p> <p>Principles in the development of safe and protective packing, Safety assessment of food packaging materials. Shelf life of packaged food products. Migration, regulatory considerations. Indian and International Food Laws, Organizations and Affiliations -FSSAI Regulations, BIS, FDA, licensing and Registration of Food Units – Central and State Licensing Authorities. FAO & WHO – Role and Functions, World Animal Health Organization, World Trade Organization, European Committee for Standardization, European Union on Food Safety, EFSA, Euro-Asian Council for Standardization, COPANT and ASEAN, ISO – special emphasis on ISO 9001:2000/2008; ISO 22000:2005; ISO 45001; ISO 14001.</p>	18	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.
VI	<p>SELF STUDY FOR ENRICHMENT (Not to be included for External Examination)</p> <p>Advantages of ECO friendly - Sustainable and biodegradable packaging. Recycling of food packaging Materials. FSSAI- Function. Codex India.</p>	-	CO1, CO2, CO3, CO4, CO5.	K1, K2, K3, K4, K5.

Text Books

1. Subbulakshmi, G, Shobha A Udipi., (2006), *Food Processing and Preservation*, New Age international Publishers, New Delhi, 1st ed.,
2. Dr Birendra Kumar Mishra., (2014),*Dairy and Food Processing Industry: Recent Trends*, Biotech Books, ISBN-10 817622300 :
3. Sivasankar.B., *Food Processing and Preservation*, Prentice Hall of India Pvt. Ltd., New Delhi.

Reference Books

1. Kees A., van der Heijden and Sanford Miller- *International Food Safety Handbook: Science, International Regulation, and Control*. Published by CRC Press. ISBN 0824793544, 9780824793548. 1999.
2. Neal D. Fortin., (2016) *Food Regulation Law, Science, Policy, and Practice*. Wiley
3. Gordon L. Robertson, *Food Packaging: Principles and Practice*, Third Edition, 2013.
4. Potter N, and Hotchkiss J.H., (2008) *Food Science*. CBS Publications and Distributors, New Delhi
5. Srilakshmi B, (2016) *Food Science*. New Age International Publishers, New Delhi
6. Joslyn and Heid, (2018) *Food Processing Operations: Management, Machines, Materials & Methods*. Vol. 1, Medtec (1 January 2018), ISBN-10 : 9789386800688

Web links

1. <https://matmatch.com/learn/material/materials-used-in-food-packaging>
2. <https://pubs.acs.org/doi/10.1021/jf900040r>

Journals

1. Journal of Packaging Technology and Research, Springer
2. Floros JD, Matsos KI. Introduction to modified atmosphere packaging. In: Innovations in Food Packaging (New York, NY: Elsevier Academic Press). p. 159–72. Public Health Nutrition, Cambridge University, England
3. Food Research International, Elsevier Science Inc, United States.
4. Journal of Food and Agriculture, Wiley-Blackwell, England

Pedagogy

Chalk and talk, PPT, Discussion, Assignment, Quiz, Seminar, Visit to food packaging industry.

Course Designers

1. Ms. T.R. REVATHI
2. Ms. M. VINOTHINI

SEMESTER- II	INTERNAL MARKS: 40		EXTERNAL MARKS: 60	
COURSE CODE	COURSE TITLE	CATEGORY	HRS / WEEK	CREDITS
22PFS2INT	DIETARY INTERNSHIP	INTERNSHIP	-	2

Course Objective

- To understand working operational aspects of dietary department in hospitals.
- To Plan modified diet according to special needs of patients.
- To learn role of Dietitian in hospitals.

Pre requisites

- Basic knowledge on various disease condition.
- Fundamental aspects of therapeutic diets.

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
CO1	Explain functions of dietary department in hospitals	K1,K2,K3, K4, K5
CO2	Schedule the organization pattern of dietary department	K1,K2,K3, K4, K5
CO3	Illustrate routine hospital diets	K1,K2,K3, K4, K5
CO4	Predict modified diet according to special condition	K1,K2,K3, K4, K5
CO5	Design tools for patient education	K1,K2,K3, K4, K5

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	3	3	2
CO2	3	3	3	3	3	3	3	3	3	2
CO3	3	3	3	3	3	3	3	3	3	2
CO4	3	3	3	3	3	3	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation.

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

SYLLABUS

The Practical work consists of internship in a IDA recognized hospital for 30 days

- Observe different areas in dietary department.
- Visit different areas in wards and hospitals.
- Experience in planning and calculating modified diets.
- Supervising and handling the food preparation and service in the dietary department of the hospital.
- Accompanying the dietitian while visiting the patient.
- Learn to use software used in dietary department.
- Develop tools for diet counseling.
- Acquire the skills to provide individual counseling.
- Case study- Selecting and observing patients requiring a therapeutic diet in relation to patients history - income, occupation, food habits, social factors, nutritional status, disease conditions and complications
- Waste management
- Energy effective technologies.

Preparation of the report should include

- History of the hospital
- Location
- Facilities provided
- Layout of the kitchen
- Work organization
- Organization structure
- Duties of the dietitian
- Special dietary preparation
- Menus
- Types of service
- Equipment
- Storage of food
- Handling of leftovers and shortages
- Sanitation and hygiene

Text Books

1. Shubhangini A Joshi (2010). *Nutrition and Dietetics* McGraw Hill Education private Limited, New Delhi
2. Gopalan C Rama Sastri V and BalasubramaniyanC (2016) *Nutritive value of Indian Foods*, National Institute of Nutrition, Hyderabad.

Reference Books

1. Joshi Y K(2003).*Basis of Clinical Nutrition*, Jaypee Brothers Medical Publishers

Web Links

- 1.<https://egyankosh.ac.in/handle/123456789/32940>
- 2.<https://egyankosh.ac.in/handle/123456789/33414>

Pedagogy

Lecture, Demonstration, Internship

Course Designers

- Ms.S.FATHIMA
- Ms.M.VINOTHINI

EVALUATION PATTERN

EXTERNALS

S.NO	COMPONENTS	MARKS
1.	Regularity	10
2.	Participation and Hands – on training	10
3.	Case Study	10
4.	Report Writing	10
5.	Counselling	10
6.	Seminar/Quiz	10
	TOTAL	60

INTERNALS

S.NO	COMPONENTS	MARKS
1.	Report	20
2.	Viva	20
	TOTAL	40