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

2023-2024 onwards

SYLLABUS

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 purse 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 OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)
(For the Candidates admitted from the Academic year 2023-2024 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)	Podhu Tamil – 1	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyan aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French I	23ULF1						
	II	English Language Course - I (ELC)	General English –I	23UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Python Programming	23UCA1CC1	5	5	3	25	75	100
		Core Practical - I (CP)	Python Programming Lab (P)	23UCA1CC1P	3	3	3	40	60	100
		First Allied Course - I (AC)	Numerical Methods	23UCA1AC1	4	3	3	25	75	100
		First Allied Course - II (AC)	Statistical Methods and its Application-I	23UCA1AC2	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course -I(AECC)	Value Education	23UGVE	2	2	-	100	-	100
	Total				**30**	**22**				**700**
II	I	Language Course – II (LC)	Podhu Tamil –II	23ULT2	6	3	3	25	75	100
			Hindi Literature & Grammar – II	22ULH2						
			Prose,Grammer and History of Sanskrit literature	23ULS2						
			Basic French–II	22ULF2						
	II	English Language Course - II (ELC)	General English -II	23UE2	6	3	3	25	75	100
	III	Core Course – II (CC)	Programming in C++	23UCA2CC2	4	4	3	25	75	100
		Core Practical - II (CP)	Programming in C++ (P)	23UCA2CC2P	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
	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**	**22**				**800**

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
III	I	Language Course - III (LC)	Podhu Tamil – III	23ULT3	6	3	3	25	75	100
			Hindi Literature & Grammar -III	22ULH3						
			Drama, Grammar and History of Sanskrit Literature	23ULS3						
			Intermediate French-I	22ULF3						
	II	English Language Course - III (ELC)	Learning Grammar Through Literature – I	23UE3	6	3	3	25	75	100
	III	Core Course – IV (CC)	Database Management Systems	23UCA3CC4	6	5	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)	23UCA3AC5P	3	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**	**22**				**700**

15 Days INTERNSHIP during Semester Holidays

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
IV	I	Language Course - IV (LC)	Podhu Tamil – IV	23ULT4	6	3	3	25	75	100
			Hindi Literature & Functional Hindi	22ULH4						
			Alankara, Didactic and Modern Literatures and Translation	23ULS4						
			Intermediate French – II	22ULF4						
	II	English Language Course – IV (ELC)	Learning Grammar Through Literature - II	23UE4	6	3	3	25	75	100
	III	Core Course – V(CC)	Programming in Java	23UCA4CC5	6	5	3	25	75	100
		Core Practical – IV (CP)	Java Programming (P)	23UCA4CC4P	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**	**24**				**800**

The Internal and external marks for theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	25	75

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).

For Practical:

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).

Internal Component (Theory)

Component	Marks
Attendance	03
Library	03
Seminar/ Quiz/ Assignment	4
CIA –I	7.5
CIA-II	7.5
Total	**25**

Internal Component (Practical)

Component	Marks
Observation	05
Record	05
Continual performance in practical	05
Model	10
Total	**25**

Question Paper Pattern

Answer all the questions

PART A (20 X 1 = 20)

Answer all the questions

PART B (5 X 5 = 25)

Answer any three questions

PART C (3 X 10 = 30)

SEMESTER - I

Semester I	Internal Marks:25			External Marks: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
23UCA1CC1 / 23UCS1CC1	**PYTHON PROGRAMMING**	**CORE**	**5**	**5**

Course Objectives

- To make students understand the concepts of Python programming
- To apply the OOPs concept in Python programming
- To make the students learn best practices in Python programming

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 fundamental concepts of Python	K1
CO2	Demonstrate the problem-solving approach using Python statements	K2
CO3	Construct the Python program using functions and modules	K3
CO4	Analyze the Python programming concepts to develop programs	K4
CO5	Develop a Python program to solve real-time problems	K5

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
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	Contents	HOURS	COs	COGNITIVE LEVEL
I	**Basics of Python Programming:** Features of Python -History of Python- Literal Constants-Variables and Identifiers–Data Types- Input Operation- Comments– Reserved Words- Indentation- Operators and Expressions –Other Data Types- Type Conversion.	**15**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Decision Control Statements:** Selection/Conditional Branching statements: if, if-else, nested if and if-elif-else statements. **Basic Loop Structures / Iterative Statements:** while loop, for loop- Nested Loops- The break Statement- The continue Statement.	**15**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Functions and Modules:** Function Definition – **Function Call:** Function Parameters – **Variable Scope and Lifetime:** Local and Global Variables- Using the Global Statement-Resolution of Names. The return Statement. **More on Defining Functions:** Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments. **Python Strings**: Strings are Immutable- Built-in String Methods and Functions – Comparing String**s. Modules:** The from…import statement- Name of Module – The dir() function – Modules and Namespace.	**15**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Lists:** Access values in List-Updating values in Lists- Nested lists -Basic list operations-List Methods. **Tuple:** Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples. **Dictionaries:** Creating a dictionary, Accessing values, Modifying an Entry -Deleting items – Built-in Dictionary Functions and Methods - Difference between a List and a Dictionary.	**15**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**File Handling:** Types of files in Python - Opening and Closing files- **Reading and Writing files**: write() and writelines() methods- append() method – read() and readlines() methods – Splitting words –File Positions.	**15**	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 lists and tuples - Defining our own modules- Renaming and deleting files.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Reema Thareja. (2017), Python Programming using problem solving approach, 1st Edition, Oxford University Press.

References

1. Dr. R. Nageswara Rao. (2017), Core Python Programming, 1st Edition, Dream tech Publishers.
2. VamsiKurama. (2017), Python Programming: A Modern Approach,1st Edition, Pearson Education.
3. Mark Lutz. (2013), Learning Python, Fifth Edition, Orielly.
4. Adam Stewarts. (2017), Python Programming, Online.
5. Fabio Nelli. (2015), Python Data Analytics,1st Edition, APress.
6. Kenneth A. Lambert. (2019), Fundamentals of Python – First Programs,2nd Edition, CENGAGE Publication.

Web References

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://en.wikipedia.org/wiki/Python_(programming_language)

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications

Semester I	Internal Marks:25			External Marks: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS / WEEK**	**CREDITS**
23UCA1CC1P	**Python Programming Lab (P)**	**CORE**	**3**	**3**

Course Objectives

- To provide programming knowledge in Python.
- To create loops and decision statements in Python.
- To build and package Python modules for reusability.
- To read and write files in Python.

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 syntax and semantics of Python.	K1
CO2	Identify the problem and solve using Python programming techniques.	K2
CO3	Identify suitable programming constructs for problem solving.	K3
CO4	Analyze various concepts of Python language to solve the problem in an efficient way.	K4
CO5	Develop a Python program for a given problem and test for its correctness.	K5

Mapping of CO with PO and PSO

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

List of Practicals

1. Program using variables, constants, I/O statements in Python.
2. Program using Operators in Python.
3. Program using Conditional Statements.
4. Program using Loops.
5. Program using Jump Statements.
6. Program using Functions.
7. Program using Recursion.
8. Program using Arrays.
9. Program using Strings.
10. Program using Modules.
11. Program using Lists.
12. Program using Tuples.
13. Program using Dictionaries.
14. Program for File Handling.

Web References

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://en.wikipedia.org/wiki/Python_(programming_language)

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr.K.Akila, Associate Professor, Department of Computer Applications

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
23UCG1AC1/ 23UCS1AC1/ 23UCA1AC1/ 23UIT1AC1	**NUMERICAL METHODS**	**ALLIED**	**4**	**3**

Course Objective

- **Learn** the various topics in Numerical methods.
- **Understand** the fundamentals of algebraic equations, interpolation, numerical differentiation and integration.
- **Develop** skills in solving problems of numerical techniques.

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	Remember the basic concepts of numerical methods.	**K1**
CO2	Illustrate the various notions of computational numerical streams.	**K2**
CO3	Apply the different techniques of numerical problems	**K3**
CO4	Classify the methods of numerical techniques.	**K4**
CO5	Examine the solutions of numerical 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	2	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	**Solution of Algebraic and Transcendental Equations**: Introduction – Bisection Method –The Iteration Method – The Method of False Position – Newton Raphson Method. (Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
II	**Interpolation:** Finite differences – Forward differences – Backward differences – Central differences – Newton's Formulae for interpolation–Interpolation with Unevenly Spaced Points – Lagrange's Interpolation Formula. (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
III	**Numerical Differentiation and Integration:** Introduction – Numerical Differentiation – Numerical Integration – Trapezoidal Rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
IV	**Numerical Linear Algebra:** Solution of Linear Systems – Direct Methods – Gauss - Elimination – Gauss -Jordan method. Solution of Linear Systems – Iterative Methods. (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
V	**Numerical Solution of Ordinary Differential Equations:** Introduction – Solution by Taylor's Series – Euler's Method – Modified Euler's Method – Runge-Kutta Method–Predictor-Corrector Methods – Adams-Moulton Method – Milne's Method(Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4
VI	**Self-Study for Enrichment (Not included for End Semester Examination)** Ramanujan's Method – Bessel's Formula – Newton-Cotes Integration Formulae –The QR Method – Picard's Method of Successive Approximations	-	CO1, CO2, CO3, CO4, CO5	K1 K2, K3, K4

Text Books

Sastry.S.S (2004), *Introductory Methods of Numerical Analysis* (Third Edition), Prentice Hall of India Private Ltd, New Delhi.

Chapters and Sections

UNIT–I	Chapter 2:	Sections: 2.1 – 2.5 (Omit 2.3.1 & 2.5.1)
UNIT II	Chapter 3:	Sections: 3.3 : 3.3.1 – 3.3.3, 3.6, 3.9 : 3.9.1
UNIT-III	Chapter 5:	Sections: 5.1, 5.2 (only), 5.4 : 5.4.1 – 5.4.3
UNIT-IV	Chapter 6:	Sections: 6.3: 6.3.2, 6.4
UNIT-V	Chapter 7:	Sections: 7.1,7.2, 7.4: 7.4.2, 7.5,7.6

Reference Books

1. Venkataraman, M.K. (2003). *Numerical Methods in Science and Engineering*, The National Publishing Company.
2. Iyengar S.R.K, Jain R.K, (2009). *Numerical Methods*, New Age International Publishers.
3. Subramanian,N. (2007). *Numerical Methods*, SCM Publisher, Erode.

Web References

1. **https://tinyurl.com/4y7knvm9**
2. **https://tinyurl.com/t29njcy5**
3. **https://www.youtube.com/watch?v=TIWRyzzFUYQ**
4. **https://www.youtube.com/watch?v=jviiGB5vxLA**
5. **https://www.youtube.com/watch?v=j_4MVZ3VADU**

Pedagogy

Assignment, Seminar, Lecture, Quiz, Group discussion, Brain storming, e-content.

Course Designer

1. Dr. V. Geetha
2. Dr. S. Sasikala

ALLIED COURSE-II (AC)

STATISTICAL METHODS AND ITS APPLICATION-I

(For BCA Students)

(2023-2024 Onwards)

Semester I	Internal Marks:25		External Marks:75	
COURSECODE	**COURSETITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
23UCA1AC2	**STATISTICAL METHODS AND ITS APPLICATION - I**	**ALLIED**	**4**	**3**

Course Objective

- **Enable** the short historical development of Statistics.
- **Provide** the knowledge to interpret and solve the statistical problems.
- **Explore** the ideas of statistical tools.

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	Remember and recall the basic concepts of statistics.	K1
CO2	Illustrate the various notions in the respective stream.	K2
CO3	Apply the different terminologies of statistics.	K3
CO4	Classify the solution of statistical methods using various techniques.	K4
CO5	Explain the solution of statistical problems.	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	2	2	2	3
CO2	2	2	3	2	2	2	2	2	2	3
CO3	3	2	3	2	2	3	2	2	3	3
CO4	3	2	2	2	2	2	2	2	2	2
CO5	2	2	2	2	3	2	3	1	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	**Measures of Central Tendency:** Averages–Arithmetic Mean – Median – Mode – Geometric Mean.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Dispersion:** Dispersion – Measures of Dispersion – Coefficients of Dispersion (Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Correlation:** Introduction – Meaning of Correlation – Scatter Diagram – Karl Pearson's Co-efficient of Correlation. **Rank Correlation:** Spearman's Rank Correlation Coefficient – Tied Ranks (Derivations not needed and Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Linear Regression:** Introduction–Linear Regression–Regression Coefficients–Properties of Regression Coefficients-Angle between Two Lines of Regression-Correlation Coefficient between Observed and Estimated Values(Derivations not needed and Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Skewness, Kurtosis, Moments:** Introduction –Meaning-Skewness- Test of Skewness- Dispersion and Skewness- Measures-Objective-Karlpearson's Coefficient of Skewness-Bowley's Coefficient of Skewness – Kelly's Coefficient of Skewness – Moments- Meaning – Kurtosis - Meaning(Simple Problems Only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**Self Study for Enrichment:** **(Not included for End Semester Examination)** HarmonicMean–Range– Repeated Ranks(Continued)– Standard Error of Estimate or Residual Variance- Sheppard's Correction for moments.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Gupta.S.C. &V.K.Kapoor. (2014). *Fundamentals of Mathematical Statistics*. Sultan Chand&Sons, New Delhi.
2. Pillai.R.S.N & Bhagavathi (2008).*Statistics Theory and Practice*. S.Chand & Sons, New Delhi.

Chapters and Sections

UNIT-I Chapter 2: Sections 2.4 – 2.8 [1]
UNIT-II Chapter 2: Sections 2.12–2.14[1]
UNIT- III Chapter 10: Sections 10.1 to 10.4 and 10.7(10.7.1, 10.7.2)[1]
UNIT-IV Chapter 11: Sections 11.1 to 11.2 (11.2.1, 11.2.2, 11.2.3, 11.2.5)[1]
UNIT-V Chapter 11: Pages : 338–363[2]

Reference Books

1. Gupta. S.C. &Kapoor. V.K.(2004). *Elements of Mathematical Statistics.* Sultan Chand & Sons, NewDelhi.
2. Veerarajan.T.(2010). *Probability, Statistics and Random Processes.* Tata Mc Graw Education Private.
3. Bhisma Rao.G.S.S. (2011). *Probability and Statistics.* Scitech Publications (India) Private Limited.

Web References:

1. **https://www.youtube.com/watch?v=6DYtC7lrVuY**
2. **https://youtu.be/64ELhoTvzk0**
3. **https://www.youtube.com/watch?v=xZ_z8KWkhXE**
4. **https://www.youtube.com/watch?v=nk2CQITm_eo**
5. **https://rcub.ac.in/econtent/ug/bcom/sem4/Business%20Statistics%20Unit%204%20Correlation%20and%20Regression.pdf**
6. **https://youtu.be/Gp6dqDLchbk**

Pedagogy

Power Point Presentation, Group Discussion, Seminar, Assignment.

Course Designer

Dr. P. Geethanjali

SEMESTER - II

Semester II	Internal Marks: 25			External Marks: 75
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
23UCA2CC2	**Programming in C++**	**CORE**	**4**	**4**

Course Objectives

- To make the student learn a programming language.
- To learn problem solving techniques.
- To teach the student to write programs in C++ and to solve the problems.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the fundamental concepts of object-oriented program	K1
CO2	Illustrate the components of C++ program	K2
CO3	Build algorithms and data structures swiftly and faster computation using programs	K3
CO4	Apply programming knowledge to develop programs	K4
CO5	Solve real time problems using C++ concepts	K5

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**	**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**	**2**	**3**	**3**	**3**	**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 LEVEL
I	**Principles of OOPS:** Basic Concepts of Object - Oriented Programming - Benefits of OOP. **Beginning with C++:** Structure of C++ Program - Compiling and linking – Tokens - Control Structures – Keywords – Identifiers and Constants – Basic Data Types – User-Defined Data Types – Storage Classes – Derived Data Types – Symbolic Constants – Type Compatibility – Declaration of Variables – Dynamic Initialization of Variables – Reference Variable – Scope Resolution Operator – Member Dereferencing Operators – Manipulators - Type Cast Operator – Expressions and Their Types – Implicit Conversions – Control Structures	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Function in C++:** The Main Function – Function Prototyping – Call by Reference – Return by Reference – Inline Function – Default Arguments – Const Arguments – Recursion – Function Overloading – Friend and Virtual Function – Math Library Function. **Classes and Objects:** Specifying a Class – Defining Member Functions – Making an Outside Function Inline – Nesting of Member Functions – Private Member Functions – Arrays within a Class – Static Data Members – Static Member Functions – Arrays of Objects – Objects as Function Arguments – Friendly Functions – Returning Objects – Const Member Functions – Local Classes	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Constructors and Destructors:** Constructors – Parameterized Constructors – Multiple Constructors in a Class – Constructors with Default Arguments – Dynamic Initialization of Objects – Copy Constructors – Dynamic Constructors – Constructing Two-Dimensional Array – Const Objects – Destructors. **Operator Overloading and Type Conversion:** Defining Operator Overloading – Overloading Unary Operator - Overloading Binary Operator - Overloading Binary Operator using Friends – Manipulation of Strings using Operators – Rule for Overloading Operators	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Inheritance:** Defining Derived Classes – Single Inheritance – Making a Private Member Inheritable – Multilevel Inheritance - Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes – Constructors in Derived Classes – Member Classes: Nesting of Classes	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**Pointers, Virtual Functions and Polymorphism:** Pointers – Pointers to Objects – this Pointer – Polymorphism – Pointers to Derived Classes – Virtual Functions – Pure Virtual Functions – Virtual Constructors and Destructors. **Managing Console I/O Operations:** Unformatted I/O Operations – Formatted Console I/O Operations	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

VI	**Self Study for Enrichment (Not to be included for External Examination)** Software Crisis – Software Evolution – Application of OOP – Application of C++ - Operators in C++ - C Structures Revisited	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

1. Balagurusamy. E. (2022). Object Oriented Programming with C++, 8th Edition, Tata McGraw Hill Education Pvt.Ltd.

References

1. Robert Lafore (2018). Object-Oriented Programming in C++, 6th Edition, Pearson Education, New Delhi.
2. Bjarne Stroustrup (2012). The C++ Programming Language, 4th Edition, Pearson Education and Dorling Kindersley.
3. Herbert Schildt (2009). The Complete Reference C++, 4th Edition, Tata Mc-Graw Hill Edition, New Delhi.

Web References

1. https://cplusplus.com/doc/tutorial/
2. https://www.w3schools.com/cpp/
3. https://www.tutorialspoint.com/cplusplus/index.htm

Pedagogy

Chalk & Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Infine Sinduja, Assistant Professor, Department of Computer Applications.

	Internal Marks: 40			External Marks: 60
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
23UCA2CC2P	**Programming in C++ (P)**	**CORE**	**3**	**3**

Course Objective

- To make the student learn a programming knowledge.
- To teach the student to write programs to solve the problems.

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Identify the logic for a given problem	K1
CO2	Recognize the syntax and construction of C++ programming code	K2
CO3	Apply the steps involved in compiling, linking and debugging C++ code	K3
CO4	Analyze the concepts of overloading, friend function, inheritance, abstract class and polymorphism	K4
CO5	Create C++ programs using all the concepts that have been covered in the theory course	K5

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**	**3**	**3**
CO3	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
CO4	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**3**	**3**

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

List of Practical

1. Simple Program.
2. Condition Statements.
3. Looping Statements.
4. Friend Function.
5. Constructor and Destructor.
6. Operator Overloading.
7. Function Overloading.
8. Inheritance.
9. Abstract Class.
10. Polymorphism.

Web References

1. https://www.programiz.com/cpp-programming/examples

2. https://www.geeksforgeeks.org/cpp-programming-examples/
3. https://www.geeksforgeeks.org/cpp-programming-examples/
4. https://www.w3schools.com/cpp/cpp_examples.asp

Pedagogy

PowerPoint Presentation, Demonstration, Discussion and Practical Session.

Course Designer

Ms. V. Infine Sinduja, 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 On the successful completion of the course, the students will be able to	Cognitive Level
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

1. Debasis Samanta (2018). Classic Data Structures, Second Edition, PHI Learning Private Limited, New Delhi. (Unit I)
2. Ellis Horowitz, Sartaj Sahni (2008). Fundamentals of Data Structure, Golgotia Publications, New Delhi.(Unit II,III,IV, V)

References

1. Seymour Lipschutz (2011). Data Structures with C, McGraw Hill Education, New York.
2. 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** On the successful completion of the course, students will be able to	**Cognitive Level**
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	**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	12	CO1, CO2, CO3, CO4,	K1, K2, K3, K4

	Limitation of Models- General Solution Methods for O.R. Models- Methodology of Operations Research- Operations Research and Decision Making **Linear Programming Problem- Mathematical Formulation** Introduction-Linear programming Problem-Mathematical Formulation of the problem -Illustrations on Mathematical Formulation of LPPs.(simple problems only) **Linear programming problem-graphical Solution and Extension** Introduction- Graphical Solution Method- General Linear Programming Problem- Canonical and Standard Forms of LPP.		CO5	
II	**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).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Transportation problem** Introduction-LP Formulation of the Transportation Problem- Existence of Solution in T.P-TheTransportation Table-Loops in Transportation Table-Solution o,f 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). **Assignment Problem** Introduction-Mathematical Formulation of the Problem- Solution Methods of Assignment Problem-Special Cases in Assignment Problems(simple problems only).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**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).	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Network Scheduling by PERT/CPM** Introduction- Network: Basic Components-Logical Sequencing- Rules of Network Construction-Concurrent Activities - Critical Path Analysis - Probability Considerations in PERT.	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

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

SEMESTER - III

Semester III	Internal Marks: 25		External Marks: 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
23UCA3CC4 / 23UCS4CC4	**Database Management Systems**	**CORE**	**6**	**5**

Course Objectives

- To understand the basic concepts and the applications of database systems
- To provide the basics of SQL and construct queries using SQL, E-R model and Normalization

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the basic concepts of database design, architecture and its data model	K1
CO2	Illustrate the structure of Relational database	K2
CO3	Apply the various queries in the database	K3
CO4	Examine the database design and E-R model	K4
CO5	Explain the concepts of Relational Database Design	K2,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	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
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	**Introduction to Database System Concepts:** Introduction – Database-System Applications – Purpose of Database Systems – View of Data: Data Abstraction – Instances and Schemas – Data Models – **Relational Databases**: Tables – Data-Manipulation Language – Data-Definition Language – Database Design: Design Process – The Entity – Relationship Model – Normalization – **Data Storage and Querying**: Storage Manager – The Query Processor – Transaction Management – Database Architecture –	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Database Users and Administrators: Database Users and User Interfaces – Database Administrator.			
II	**Introduction to Relational Model and SQL:** Structure of Relational Databases – Database Schema – Keys – Schema Diagrams – Relational Query Languages – Relational Operations - **Introduction to SQL**: Overview of the SQL Query Language – **SQL Data Definition**: Basic Types – Basic Schema Definition – Basic Structure of SQL Queries: Queries on Single Relation – Queries on Multiple Queries - The Natural Join.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Introduction to SQL: Additional Basic Operations**: The Rename Operation – String Operations – Attributes Specification in Select Clause – Ordering the Display of Tuples – Where clause Predicates – Set Operations: The Union Operation – The Intersect Operation - Except Operation – Null Values – **Aggregate Functions**: Basic Aggregation – Aggregation with Grouping - The Having Clause - Nested Sub queries: Set Membership – Set Comparison – Modification of the Database.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Database Design and E-R Model : The Entity – Relationship Model**: Entity Sets – Relationship Sets – Attributes – Constraints: Mapping Cardinalities – Keys – **Entity-Relationship Diagrams**: Basic Structure – Mapping Cardinality - Complex Attributes - Weak Entity Sets – **Design Alternative**: Smaller Schemas - Atomic Domains and First Normal Form Decomposition using Functional Dependencies: Keys and Functional Dependencies - Boyce-Codd Normal Form - BCNF and Dependency Preservation – Third Normal Form	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**Relational Database Design: Functional Dependency Theory**: Closure of a set of Functional Dependencies - Closure of Attribute Sets - Canonical Cover – Lossless Decomposition – Dependency Preservation. **Transaction Management:** Transaction Concepts-A Simple Transaction Model-Storage Structure-Transaction Atomicity & Durability-Transaction Isolation.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self-Study for Enrichment (Not to be included for End Semester Examination)** SQL data types and Schemas - Reduction to Relational Schemas - ER design issues - E-R diagram for the University Enterprise.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Textbook

Abraham Sliberschatz, Henry F Korth & Sudharsan. (2013). Database System Concepts, 6th Edition , McGraw Hill Education (India) Private Limited.

References

1. Alexis Leon, Mathews Leon. (2009). Essentials of Database Management Systems, McGraw Hill Education India Pvt Ltd.
2. Peter Rob, Carlos Coronel (2009). Database System Concepts, Lengage Learning.

Web References

1. https://beginnersbook.com/2015/04/dbms-tutorial/

2. https://www.studytonight.com/dbms/
3. https://www.tutorialspoint.com/dbms/

Pedagogy

Chalk and Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr. Lakshna Arun, Associate Professor, Department of Computer Applications.

Semester III	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
22UCA3CC3P	**Database Management Systems (P)**	**CORE**	**3**	**3**

Course Objective

- To provide in depth programming knowledge in MYSQL

Course Outcomes and Cognitive Level Mapping

COs	CO STATEMENTS On the successful completion of the course, students will be able to	COGNITIVE LEVEL
CO1	Recall DDL and DML Commands	K1
CO2	Apply Arithmetic, Logical and Set operators	K3
CO3	Implement string operations	K3
CO4	Use Join operations in SQL Queries	K3
CO5	Create Bank Database	K5

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
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.

List of Practical

1. Create a table and perform the following DDL operations
    a. Set the primary key
    b. Check Constraints
    c. Alter the structure of the table
    d. Drop the table
2. Create a table and perform the following DML operations
    a. Insert Values
    b. Update 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. JOIN and SUB Queries
5. Implement Grouping and Ordering Commands in a Table.
6. Develop MYSQL queries to implement String operations using % and "_"

   [Note: create necessary tables for the above questions (1 to 8) with required attributes]
7. 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

Web References

1. https://beginnersbook.com/2015/04/dbms-tutorial/
2. https://www.studytonight.com/dbms/
3. https://www.tutorialspoint.com/dbms/

Pedagogy

Demonstration, Discussion, Assignment, and Seminar.

Course Designer

Dr. Lakshna Arun, Associate Professor, Department of Computer Applications.

SemesterIII	Internal Marks:25		External Marks: 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs. /Week**	**CREDITS**
22UCA3AC4	**FINANCIAL ACCOUNTING**	**ALLIED**	**4**	**3**

Course Objective

- To equip the students with fundamental knowledge and acquire analytical skills on the accounting concepts.

Course Outcome and Cognitive Level Mapping

CO Number	COStatement On the successful completion of the course, students will be able to	Cognitive Level
CO1	Define the basic concepts of Accounting	**K1**
CO2	Explain the accounting rules required for business enterprise	**K2**
CO3	Make use of accounting concepts to interpret the performance of business	**K3**
CO4	Analyze the financial statement of the firm	**K4**

Mapping of CO with PO and PSO

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

"1"–Slight(Low)Correlation¬ "2"–Moderate(Medium)Correlation¬
"3"–Substantial (High)Correlation¬ "-"indicate there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Accounting Meaning – Definition of Accounting – Need for Accounting – Meaning of Book Keeping Book Keeping Vs Accounting – Accounting Principles – Accounting Cycle –Accounting Equation. Double Entry: Meaning – Nature and principle of Double Entry. Journal: Meaning and Need – Steps in Journalizing – Exercises of Journal Entry	**12**	**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**

II	Ledger: Meaning – Utility – Format – Posting – Balancing an Account – Preparation of Trial Balance – TotalMethod – Balance Method - Comprehensive Problems on Journal, Ledger and Trial Balance	**12**	**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**
III	Subsidiary Books – Meaning – Cash Book – Simple cash book – Two Column cash book with Bank and Discount Columns – Three Column cash book – Petty Cash Book – Imprest System – Analytical petty cash book- Problems on Triple Column Cash Book and Petty cash book	**12**	**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**
IV	Pass Book – need for Bank Reconciliation statement – Methods of Preparation of Bank Reconciliation Statement – Favorable and Unfavorable Balances – Problems on BRS Depreciation – Meaning – Straight Line Method, Diminishing Balance Method and Annuity Method. (Simple Problems only)	**12**	**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**
V	Meaning – Need for Preparation – Components of Final Accounts – Trading Account – Profit and Loss Account – Balance sheet – Adjustments – Problems with adjustments	**12**	**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**
IV	**Self Study for Enrichment (Not to beincluded for External Examination)** Distinction between Journal and Ledger – Objective of Preparing Trial Balance – Benefits of subsidiary book System – Causes for the differences between cash book and pass book- Differences Between Trial Balance and Balance sheet – Need for Providing Depreciation		**CO1, CO2, CO3, CO4**	**K1, K2, K3, K4**

Text Book

1. S.P.Jain and K.L.Narang (2016), Fundamentals of Accounting, Kalyani Publishers, 2017
2. T.S. Reddy& Murthy (2020), Financial Accounting, Margham Publications, 2017

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 Reference

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

Ms. G. Kanagavalli

Semester III	Internal Marks:40		External Marks: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs. / Week**	**CREDITS**
23UCA3AC5P	**COMPUTER APPLICATIONS IN BUSINESS (P)**	**ALLIED**	**3**	**3**

Course Objective

- The primary objective of this course is to expose the students with the Accounting Software Tally ERP9 with GST

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 basic concepts of components of computer	**K1**
CO2	Understand the basic features of Tally ERP 9	**K2**
CO3	Prepare different types of financial reports	**K3**
CO4	Analyze stock group, stock category, stock item and compare stockcategory summary with godown summary.	**K4**
CO5	Explain the procedure for GST Registration	**K5**

Mapping of CO with PO and PSO

COs/ PSOs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	**3**	**3**	**3**	**3**	**2**	3	2	3	3	2
CO2	**3**	**3**	**3**	**3**	**2**	3	2	3	3	2
CO3	**3**	**3**	**3**	**3**	**3**	3	2	3	3	2
CO4	**3**	**3**	**3**	**3**	**2**	3	2	3	3	2
CO5	**3**	**3**	**3**	**3**	**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	Introduction to computerized Accounting – Features – Advantages –Manual Accounting Vs .Computerized Accounting – Accounting transaction.	**9**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**

II	Introduction to Tally ERP 9 – Features of Tally – Creation of Company – Selecting a Company – Altering / Modifying existing company – Configuration of Tally – Tally screen and Menu – Accounting Features – Accounting Groups – User defined groups – Ledger creation, alteration and deletion	**9**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**
III	Accounting vouchers – inventory vouchers – invoicing – optional & non-accounting voucher – order processing – advanced Voucher entry.	**9**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**
IV	Introduction to Cost – Creation of cost Categories – Creation of Cost Centre– Editing – Deleting – Usage of Cost Category and Cost Centres in voucher entry – Inventory Information: Stock Groups – Stock Categories – Godowns – Unit Of Measure – Stock Items – Purchase orders and Sales orders processing.	**9**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**
V	Goods and Service Tax (GST): GST Concepts – Enabling GST – Configuring Master with GST Details – GST Reports	**9**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**
VI	**Self-Study for Enrichment (Not to be included for End Semester Examination)** Journal Entry – Ledgers – Trial Balance – Balance Sheet - Adjustments	**-**	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3, K4, K5**

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. Creation of Inventory Reports
7. Creation of GST Registration

Text Book

1. V. SrinivasaVallabhan (2014). *Computer Applications in Business,* SultanChand & Sons
2. A.K. Nadhani(2015), Computer Application by Implementing Tally ERP, BPBPublications,Chennai.
3. Mohan Kumar K, Rajkumar.S.(2019). *Computer applications in business.* Revised Edition. Tata McGraw Hill Education

Reference Books

1. Ashok K. Nadhani, "TALLY ERP 9 TRAINING GUIDE - 4TH REVISED &UPDATED EDITION", January 2018.
2. Official guide to financial accounting using TALLY ERP 9 with GST, TallyEducation P. Ltd.
3. Chadwick, L, "The Essence of Financial Accounting", PHI, 2nd Edition.

Web Reference

1. https://gstcentre.in/gst-in-tally-erp-9.php#collapseOne
2. http://www.tallysolutions.com
3. https://help.tallysolutions.com/docs/te9rel66/Job_Work/#gref
4. https://www.tallyofficialbooks.com/
5. https://ncsmindia.com/wp-content/uploads/2012/04/TALLY-9.0-PDF.pdf.

Pedagogy

Lecture and Lab demonstration

Course Designer

Ms. S. Praveena

Semester III	Internal Mark:40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
22UCA3GEC1P	**ANIMATION TOOLS - I (P)**	**GEC**	**2**	**2**

Course Objective

- To impact training on Animation Tools

Course Outcomes and Cognitive Level Mapping

COs	CO STATEMENTS On the successful completion of the course, students will be able to	COGNITIVE LEVEL
CO1	Recall pen, and brush tools in Photoshop	K1
CO2	Apply resolution, grayscale, black and white to an image	K3
CO3	Using layers, rotation, overlapping of an image	K3
CO4	Creating custom colours, gradients, grouping of an image	K5
CO5	Develop an image by applying masks and filters	K5

Mapping of CO with PSO and PO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	2	1	1	3	3	2	3	2
CO2	3	2	3	1	1	3	2	2	3	3
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.

List of Practical

1. THE WORKING PLACE (Installing Photoshop & Learning its interface)
2. TOOLS
   - Basic Tools Selection Tools
   - Drawing and Coloring Tools
   - Advanced Tools
   - Text Tools
   - Tools Presets
3. USING BRUSH & PAINT
   - Brush Presets, Colors & Shapes
   - Create a multicolor real-life image using the brush tool.
4. WORKING WITH SELECTION

- Making Selections with DifferentTools
- Modifying an Existing Selection
- Saving and Loading Selections

5. MAGE SIZE, RESOLUTION, AND COLOR CHANGE
    - Changing the size, resolution, and gray scale of an image.
    - Convert black and white images into color image.
6. IMAGE MODIFICATION
    - Cropping, rotating, overlapping, and superimposing an image.
7. COMMERCIAL BROCHURE
    - Develop a commercial brochure with background tints.
8. LAYERS
    - Working with layers (creation, deletion, merge).
9. FILTERS AND MASKS
    - Applying masks and filtering on images.
10. PLAYING WITH PALETTES
    - Arranging Workspace
    - Various Palettes

Web References

- https://helpx.adobe.com/in/photoshop/tutorials.html
- https://www.javatpoint.com/photoshop
- https://www.photoshopessentials.com/basics/

Pedagogy

Demonstration, Powerpoint Presentation

Course Designer

Ms. M. Ellakkiya, Assistant Professor, Department of Computer Applications.

SEMESTER - IV

Semester IV	Internal Mark: 25		External Mark: 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs / Week**	**CREDITS**
23UCA4CC5	**Programming in Java**	**CORE**	**6**	**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 basic concepts of OOPs
- Enhance problem solving skills

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, the students will be able to	Cognitive Level
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. **Java Evolution:** 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 – Getting Values of Variables - Scope of Variables – Symbolic Constants -Type Casting.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
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.	**18**	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 – Finalizer Methods - Abstract Methods and Classes – Visibility Control. **Arrays, Strings and Vectors**: Creating Arrays – One and two-Dimensional Arrays - Strings – Vectors – Wrapper Class. **Interfaces: Multiple Inheritance:** Introduction - Defining Interfaces - Extending Interfaces- Implementation Interfaces - Accessing Interfaces Variables.	**18**	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 – Life Cycle of Thread - Thread Priority – Synchronization. **Managing Errors and Exceptions:** Introduction - Types of Errors - Exceptions- Syntax of Exception Handling Code - Multiple Catch Statements – Using Finally Statement.	**18**	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 - 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.	**18**	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self-Study for Enrichment** **(Not to be included for External Examination)** **Managing Errors and Exceptions:** Multiple Catch Statements - Throwing our own Exceptions. **Applet Programming:** Building Applet Code - Applet Life Cycle - Creating and Executable Applet – Designing a Web Page using Applet – **Graphics Programming using AWT, Swing and Layout Manager:** Drawing Arcs- Drawing Polygons. **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 Hill Education.

Web References

1. https://www.javatpoint.com/java-tutorial
2. https://www.guru99.com/java-tutorial.html
3. https://www.w3schools.com/java/
4. https://www.geeksforgeeks.org/java/
5. https://www.tutorialspoint.com/java/index.htm

Pedagogy

Chalk and Talk, PowerPoint Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Ms. V. Yasodha, Assistant Professor, Department of Computer Applications.

Semester IV	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
23UCA4CC4P	**Java Programming (P)**	**CORE**	**4**	**4**

Course Objective

- To impart practical training on Java Programming

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	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 Practicals

Develop a Java Program using the concept of

1. Classes and Objects
2. Constructors
3. Method Overloading
4. Inheritances
5. String Handling
6. Interfaces
7. Packages
8. Multithreading
9. Exception Handling
10. Menu and Dialog Box
11. Swing Components
12. 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.tutorialspoint.com/java/index.htm

Pedagogy

Demo and Discussion.

Course Designer

Ms. V. Yasodha, Assistant Professor, Department of Computer Applications.

Semester IV	Internal Marks: 25		External Marks: 75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs / Week**	**Credits**
22UCA4AC6	**BUSINESS COMMUNICATION**	**ALLIED**	**4**	**3**

Course Objectives

- To provide an overview of prerequisites to Business Communication.
- To impart the correct practices of the strategies of Effective Business writing.
- To acquire good communication skills requisite for business correspondence and reporting.

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	Select the appropriate organizational formats, channels used in developing and presenting business messages.	**K1**
CO2	Explain the modern communication used in the business.	**K2**
CO3	Summarize the process of report writing and develop the interview techniques.	**K2, K3**
CO4	Identify ethical, legal, cultural and global issues affecting business communication.	**K3**
CO5	Analyse the situation of writing various types of letters.	**K4**

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**	**3**	**3**	**2**
CO2	**3**	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**2**
CO3	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**
CO4	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**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 LEVEL
I	Communication – Needs – Objectives – Communication Media – Process – Characteristics – Barriers of Communication – Steps to overcome barriers of Communication.	12	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4**
II	Business letter – Needs – Function – Kinds of Business letter – Essentials of an Effective Business letter – Structure of Business letter – Letter of Enquiries and replies.	12	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4**
III	Application letter – Preparation of Resume – Interview Meaning – Objective and Interview Techniques – Interviewee's Preparation for the Interview and Conduct during the Interview.	12	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4**
IV	Modern forms of Communication – Email Mechanics of an e-mail – Layout of e-mail Teleconference , voicemail – Internet – multimedia Teleconferencing – Mobile Phone – SMS – Telephone Answering machine.	12	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4**
V	Reports – Introduction – Types – Preparation – Structure and Organization of reports – Reports by individuals and committees press releases.	12	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4,K5**
VI	**Self-Study for Enrichment (Not to be included for External Examination)** Circular letters – Objectives – Situations that need Circular letters – Sales letters – Bank Correspondence.	-	**CO1,CO2, CO3,CO4, CO5**	**K1, K2, K3,K4**

Text Books

1. Rajendra Pal , J.S. Korlahalli (2015). *Essentials of Business Communication*. Reprint. Sultan Chand & Sons.
2. Sharma R. C, Krishna Mohan (2017). *Business Correspondence and Report Writing* . 6th EditionTata Mc-Graw Hill.
3. Subba Rao .P (2013). *Business Communication*. Reprint. Cengage Learning India..

Reference Books

1. Krishnamacharyulu, Lalitha. R (2018). *Business communication*. 3rd Edition. Himalaya Publishing House.
2. Mathur S. P (2017). *Business Communication*. 2nd Edition.New Age International Publishers.

3. Sundar K, Kumara Raj .A (2019). *Essentials of Business Communication*. Reprint. Vijay Nicole Imprints Private Limited.

Web Reference

1. https://www.marketingtutor.net/communication-media-definition-types-examples/
2. https://www.vedantu.com/commerce/essential-qualities-of-a-good-business-letter
3. https://www.themuse.com/advice/the-ultimate-interview-guide-30-prep-tips-for-job-interview-success
4. https://www.yourarticlelibrary.com/business-communication/modern-forms-of-communication-fax-email-and-videoconferencing/27654
5. https://www.eapfoundation.com/writing/reports/structure/

Pedagogy

Lecture, Power Point Presentation, Group discussion, Seminar and Assignment.

Course Designer

Mrs. D. Indumathi.

Semester IV	Internal Marks: 40		External Marks: 60	
COURSE CODE	**COURSETITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
22UCA4GEC2P	**Animation Tools-II (P)**	**GEC**	**2**	**2**

Course Objective

- To impact training on Tools in Flash

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive Level
CO1	Learn the basic concepts of animation as an art.	K1
CO2	Apply different types of tools	K3
CO3	Use trace and mask in image	K3
CO4	Create shape & motion tweening	K4
CO5	Develop 2D animations	K5

Mapping of CO with PO and PSO

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

List of Practical

1. Basics of Flash
2. Types of Tools
3. Trace a Character in Flash
4. Working with Masking
5. Create Animation using Text
6. Demonstrate Shape & Motion Tween
7. Develop a commercial brochure
8. Create a Snowfall Animation using Flash

Web References

1. https://helpx.adobe.com/in/flash/tutorials.html
2. https://www.geeksforgeeks.org/flash/

Pedagogy

Power Point Presentation, Demonstration and Practical Sessions.

Course Designer

Ms. M. Ellakkiya, Assistant Professor, Department of Computer Applications.

Semester IV	Internal Marks:40		External Marks:60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS/WEEK**	**CREDITS**
22UCA4SEC1P	**Documentation and Presentation Tools (P)**	**SEC**	**2**	**2**

Course Objective

- To impact training on Multimedia Tools

Course Outcomes and Cognitive Level Mapping

CO Number	CO Statements On the successful completion of the course, students will be able to	Cognitive level
CO1	Creating documents using template in MS–word	K1
CO2	Demonstrate usage of slides in MS–Power point	K2
CO3	Creating slides with Multimedia tools	K3
CO4	Ability to understand the various kinds of tools.	K2
CO5	Develop e-content in power point by their own	K4

Mapping of CO with PO and PSO

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

List of Practical

1. **Working with 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
   - Manipulation of Table–Creation, insertion, deletion (Columns and rows)
   - Create a Mark Sheet using table and find out total of all marks for each student
   - Prepare a Greeting Card: Picture insertion and alignment
   - Create a document using template

- Prepare a Letter
- Prepare a Biodata
- Mail Merge:- Prepare Convocation invitations to be sent to specific addresses in the data source.

2. Creating PowerPoint Presentation

Slide show presentation for a seminar chooses your own topics.

- Enter the text in outline view
- Create on – bulleted and bulleted body text
- Apply the appropriate text attributes

- Presentation using wizards -Usage of design templates: - Creation of a slide show presentationusing different presentation template and different transition effect for each slide. Use differenttext attributes in each slide.
- Develop an e-content in power point using multimedia tools (10 slides)

Web References

1. https://support.microsoft.com › en-us › office › add-and
2. https://www.javatpoint.com › how-to-insert-picture-an. 3. https://www.javatpoint.com › excel-work-sheet-rows-c..

Pedagogy

Demonstration, Power point Presentation, Discussion and Practical Session.

Course Designer

Dr. T. Julie Mary, Assistant Professor, Department of Computer Applications.