CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH "A" GRADE BY NAAC
TIRUCHIRAPPALLI-18

PG & RESEARCH DEPARTMENT OF COMPUTER SCIENCE

B.Sc Computer Science with Cognitive Systems

2024 - 2025 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG AND RESEARCH DEPARTMENT OF COMPUTER SCIENCE

<u>VISION</u>

To create an ambience for a quality academic erudition which drives technologically adept, innovative and globally competent graduates with ethical values

<u>MISSION</u>

- To have a breath 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
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 to wards 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 OUT COMES 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 under standing 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 WITH COGNITIVE SYSTEMS

PSO NO.	The students of B.Sc Computer Science with Cognitive Systems Will be able to	Pos Addressed
PSO1	Gain knowledge in the core topics of Computer Science and to develop an Equal appreciation of current industry standards.	PO1,PO2
PSO2	Equip them as industry ready students and an entrepreneur with significant knowledge on digital ecosystem that provide values to business needs in the area of IT Infrastructure and IT Application, Maintenance & Service Support.	PO2, PO3, PO4, PO5
PSO3	Apply appropriate techniques and skills in various domains of computer Science to solve real world problems.	PO1, PO2, PO4,
PSO4	Create awareness on current issues and latest trends in technological development and there by implement innovative ideas and solutions to existing problems in society.	PO2, PO4, PO5
PSO5	Implement in dependent projects of their own choice using latest tools and also work as an effective team member to attain the predefined goals.	PO1, PO3, PO5

CIA COMPONENTS

Theory Courses

Component	Marks
Attendance	03
Library	03
Seminar/Quiz/ Assignment	04
CIA- I	7.5
CIA - II	7.5
Total	**25**

Practical Courses

Component	Marks
Observation	05
Record	10
Continuous Performance in Practical	10
Model Practical	15
Total	**40**

Theory & Practical Courses (50 marks)

Component	Marks
CIA Tests- Theory	2 x 5 =10
Record Note	05
Internal Practical Exam by External Practical Examiner	30
Viva Voce	05
TOTAL	**50**

Cauvery College for Women (Autonomous)

PG & Research department of Computer Science

B.Sc Computer Science with Cognitive Systems

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2024-2025 and onwards)

Semester	Part	Course	Course Title	Course Code	Inst. Hrs. /week	Credits	Exam Hrs.	Exam Marks Int	Exam Marks Ext	Total
I	I	Language Course-I (LC)	பொதுதமிழ்-I	23ULT1	6	3	3	25	75	100
			Hindi ka Samanya Gyanaur Nibandh	23ULH1						
			Poetry, Grammer 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)	Operating Systems(T & P)	22UCG1CC1	4+2	6	2	50*	50*	100
		Core Practical - I (CP)	Introduction to Worksheet(P)	22UCG1CC1P	2	2	3	40	60	100
		Core Course – II (CC)	IT Cognition	22UCG1CC2	3	3	3	25	75	100
		First Allied Course- I (AC)	Applied Mathematics	22UCG1AC1	5	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-I (AECC)	UGC Jeevan Kaushal - Value Education	23UGVE	2	2	-	100	-	100
		Total			**30**	**22**				**700**
II	I	Language Course-II(LC)	பொதுதமிழ்-II	23ULT2	6	3	3	25	75	100
			Hindi Literature &Grammar–II	22ULH2						
			Prose, Grammar 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– III(CC)	Java Programming	23UCG2CC3	4	4	3	25	75	100
		Core Practical-II(CP)	Java Programming (P)	23UCG2CC2P	2	2	3	40	60	100
		Core Course– IV(CC)	Information Technology Infrastructure Library	22UCG2CC4	2	2	3	25	75	100
		First Allied Course–II(AC)	Statistics	22UCG2AC2	4	3	3	25	75	100
		First Allied Course–III(AC)	Operations Research	22UCG2AC3	4	3	3	25	75	100
	IV	Ability Enhancement Compulsory Course-II (AECC)	Environmental Studies	22UGEVS	2	2	-	100	-	100
		Total			**30**	**22**				**800**

T & P: ESE: 50 (Theory Exam), CIA: 50* (Practical: 40 + Theory :10)

Question Paper Pattern

Question Paper Pattern for Theory Courses with 75 marks

BSc Degree Examination

Time: 3 Hrs   **Max.Marks:75**

Section A

Answer ALL Questions (20 * 1=20)

1 to 5. Choose the best Answer

6 to 10. Fill in the Blanks

11 to 15.Say True or False

16 to 20.Answer in one or Two sentences

Section- B

Answer ALL Questions (5*5=25)

21 (a) or (b)

22 (a) or (b)

23 (a) or (b)

24 (a) or (b)

25 (a) or (b)

Section- C

Answer any THREE questions (3*10=30)

26.

27.

28.

29.

30.

Question Paper Pattern for Theory & Practical Courses with 50 marks

BSc Degree Examination

Time: 2 Hrs   **Max.Marks:50**

Section A

Answer ALL Questions (10 * 1=10)

1 to 10. Choose the best Answer

Section- B

Answer ALL Questions (5*3=15)

11 (a) or (b)

12 (a) or (b)

13 (a) or (b)

14 (a) or (b)

15 (a) or (b)

Section- C

Answer any FIVE questions (5*5=25)

16.

17.

18.

19.

20.

21.

22.

23.

SEMESTER I

Semester I	Internal Marks: 50			External Marks:50	
COURSE CODE	COURSE TITLE	CATEGORY	HRS. / WEEK		CREDITS
22UCG1CC1	OPERATING SYSTEMS (T & P)	CORE	T	P	6
			4	2	

Course Objective

- To recognize the concepts and principles of Operating Systems
- To inculcate knowledge on client and server OS
- To learn how to install, configure, deploy, manage and maintain the Operating System

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 Understand the fundamentals of computer and Operating Systems	K1,K2
CO2	Analyze and Categorize the components of Operating Systems	K3,K4
CO3	Examine and Explain the performance of Operating Systems services	K4,K5
CO4	Identify and Apply the appropriate methods or instructions to manage the resources	K3, K5
CO5	Compare and Interpret the functionalities of Operating Systems	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	3	2
CO2	3	3	3	3	3	3	3	3	3	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:

Theory:

Unit	Content	Hours	COs	Cognitive Level
I	**Introduction to Operating Systems** Computer Basics: Definition of a Computer - Characteristics and Applications of Computers – Block Diagram of a Digital Computer – Classification of Computers based on size and working **Hardware Basics:** Central Processing Unit – I/O Devices-Memory Devices- Secondary storage devices **Operating System Basics:** OS Definition, Functions, OS as a Resource Manager, Types of OS, Evolution of OS, Operating System Operations, Operating System Services, User Operating System Interface, System Calls, Types of System Calls.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Process Management :** Basic Concepts, Process Scheduling, Operations on Processes, Inter-process Communication, Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Memory Management :** Memory Management Strategies, Swapping, Contiguous Memory Allocation, Paging, Segmentation, Virtual Memory Management, Demand Paging, Page Replacement Techniques and Algorithms	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**Storage Management :** File Concept, Access Methods, Directory Structure, Protection, Implementing File Systems, File System Structure, Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**Operating Systems :** **Introduction to Linux**: Versions, Components, Features; Installation of Linux OS, Managing Directories, Managing Files **Introduction to Windows**: Versions, GUI Components, Features; Installation of Client OS and Server OS, Installation of Roles and	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

	Features, Managing Users and Groups, Managing Devices and Printers, Storage Management, Managing and Monitoring of Server, Backup & Restoration				
VI	**Self Study for Enrichment** **(Not to be included for** **End semester Examinations)** Installation of various OS – create and run virtual machine with Hyper-V – Configure IPv4 and IPv6-Group policy management-virtualization in cloud computing	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Book:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne. (2009). *Operating System Concepts*. (7th Edition).Wiley.

Web References:
1. Operating Systems - Silberschatz, Galvin
2. Operating System – Neso Academy

Practical:
List of Exercises
1. Installation of Linux OS (CentOS)
   - Explain the steps to Install the Linux OS
   - Demonstrate Working with Directories in Linux (*pwd, cd, absolute and relative paths, ls, mkdir, rmdir, file, touch, rm, cp, mv, rename, head, tail, cat, tac, more, less, strings, chmod*)
   - Demonstrate Working with Files in Linux (*ps, top, kill, pkill, bg, fg, grep, locate, find, date, cal,uptime, whoami, finger, uname, man, df, du, free, whereis, which*)
2. Installation of Windows Client OS
   - Explain the steps to Install the Client OS
   - Install a Virtual Machine with Windows Client OS
3. Managing Windows Client OS
   - Explain the steps to Create Users and Groups
   - Demonstrate the usage of Devices and Printers
   - Demonstrate the usage of Disk Management Console
4. Installation of Windows Server OS
   - Explain the steps to Install the Server OS
   - Install a Virtual Machine with Windows Server OS
5. Managing Windows Server OS
   - Demonstrate how to Install Roles and Features
   - Demonstrate the Usage of Server Storage Management
   - Explain the various Management and Monitoring requirements
   - Explain the Backup Types and steps to take Backups

Resources:
Lab Requirements: Linux
- CentOS Linux ISO

Windows
- Windows 10 Evaluation – 90 Days
- Windows Server 2019 Evaluation – 180 Days
- Windows Server 2016 Evaluation – 180 Days

CentOS Linux
- Installation Guide
- CentOS Overview
- Basic CentOS Linux Commands
- File and Folder Management

Windows 10
- Windows 10 – Tutorials Point
- Windows 10 Tutorial

Windows Server 2016
- Windows Server – Channel 9
- Windows Server Administration for Beginners
- Windows Server 2016 Tutorial Step by Step Full
- Windows Server 2016 Administration Full Course
- Windows Server deployment, configuration, and administration

Pedagogy
Chalk & Talk, PowerPoint Presentation, Demonstration, e-Content

Course Designer
TCS

Semester I	Internal Marks:40		External Marks:60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**HRS./WEEK**	**CREDITS**
22UCG1CC1P	**INTRODUCTION TO WORKSHEET (P)**	**CORE**	**2**	**2**

Course Objective

- To perform basic calculations and formatting
- To inculcate the knowledge of Macros
- To create applications using VBA code

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	Demonstrate the use of basic functions, LOOKUPS and Formatting	K2
CO2	Build Applications using VBA code	K3
CO3	Write Macros	K3
CO4	Implement data visualization	K3
CO5	Handle large amount of data using Pivot table	K3

Mapping of CO with PSO and PO

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

EXCEL

1. Excel worksheet for Formatting, Math function and Text function
2. Excel worksheet for Graph Function
3. Excel worksheet for VLOOKUP, HLOOKUP and other LOOKUPS
4. Excel worksheet for Pivot

VBA

5. Unhide all worksheets at one Go
6. Hide All Worksheets except the Active Sheet
7. Protect and Unprotect All worksheets in a Workbook
8. Save each Worksheets as a separate PDF
9. Change the Letter Case of Selected Cells to Upper Case
10. Sort Data by Single and Multiple Columns
11. Highlight Blank Cells with VBA

Software Essentials: Microsoft office 2007

Web References
1. https://www.excel-exercise.com/beginner/
2. https://trumpexcel.com/excel-macro-examples/

Pedagogy
Power point Presentation, Demonstration

Course Designer
TCS

Semester I	Internal Marks:25			External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS./WEEK		CREDITS
22UCG1CC2	IT COGNITION	CORE	3		3

Course Objective

- To enable the learners to understand the concepts of cognitive process
- To empower the learners with the skills required for virtual collaboration and cultural sensitivity

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 and Construction of Mental Activity	K1,K2
CO2	Summarize and Experiment with the Functions of Brain	K2,K3
CO3	Interpret and make use of Mental Representation	K2,K3
CO4	Classify and Explain the Sensory Activity	K4,K5
CO5	Build and Analyze the Intellectual ability	K3,K4

Mapping of CO with PSO and PO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	2	2	2	2	2	2	1
CO2	2	2	3	3	2	3	3	2	2	2
CO3	2	3	3	3	3	2	3	3	2	2
CO4	1	2	2	2	2	2	3	2	2	2
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	**Introduction to Cognition**: Meaning, Cognitive processes, Development of Cognitive psychology.	7	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**Perceptual Processes of Attention**: Divided attention, Selective Attention, Visual attention and Auditory attention. Consciousness: Varieties, Subliminal Perception. Visual Perception Perceptual Organizational Processes, Multisensory interaction and Integration: Synthesis, Comparing the senses, Perception and Action.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**Memory- Working Memory**: Factors affecting the capacity of working Memory. Long Term Memory: Encoding and Retrieval in Long TermMemory, Autobiographical Memory. Memory Strategies: Practice, Mnemonics using Imagery, Mnemonics using organization. Metacognition: Meta memory, TOT, Meta comprehension.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**The Characteristics of Mental Images** – Imagery and Rotation, Imagery and Distance, Imagery and Shape, Imagery and interference, Imagery and Ambiguous Figures, Imagery and other vision -like Processes. **Cognitive Maps**: Background information about cognitive maps, Cognitive Maps and Distance, Cognitive Maps and Shape,Cognitive Maps and relative Position.	10	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	**Future Skills:** Critical thinking, Adaptive thinking, Cognitive Load Management, Design thinking, Virtual Collaboration and CulturalSensitivity.	8	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment:** (**Not to be included for End Semester Examination**) Language Production And Bilingualism: Speaking – Producing a word, producing a sentence, speech errors, producing disclosure. Writing – Cognitive model of writing, planning the writing assignment. Bilingualism and Second Language Acquisition – Background and advantages of bilingualism.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Suggested Readings

1. Matlin, M.W. (2003). *Cognition* (5th Edition). Wiley Publication.

2. Riegler, B.R., Reigler,G.L. (2003).*Cognitive Psychology–Applying the Science of Mind* (2nd Edition). Pearson Education.

3. Benjafield, J.G. (2007). *Cognition* (3rd Edition). Oxford University Press.

4. Goldstein, B.E. (2008).*Cognitive Psychology* (2nd Edition). Wadsworth.

Web References

1. https://sjsu.edu/people/mark.vanselst/courses/p135/s1/Kellogg_c1_fall2013.pdf

2. https://jvapartners.com/problem-solving-and-decision-making-in-a-vuca   environment/

3. https://plato.stanford.edu/entries/critical-thinking/

Pedagogy

Chalk & Talk, PowerPoint Presentation

Course Designer

TCS

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FIRST ALLIED COURSE –I (AC)

APPLIED MATHEMATICS

(For B.Sc Computer Science with Cognitive Systems)

(2022-2023 and Onwards)

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Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
22UCG1AC1	**APPLIED MATHEMATICS**	**ALLIED**	**5**	**3**

Course Objective

- **Apply** the basic concepts of Differentiation, Integration and their applications.
- **Compute** mathematical quantities using Numerical methods.
- **Explore** fundamental concepts in graph theory.

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 applied mathematics.	**K1**
CO2	Illustrate the various notions in the respective streams.	**K2**
CO3	Apply the different terminologies of applied mathematics	**K3**
CO4	Classify the solutions of mathematical problem using peculiar techniques.	**K4**
CO5	Examine the 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	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

<div align="center">

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

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

</div>

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**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	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
II	**Differentiation & Integration** Maxima and Minima (Problems Only) –Points of inflexion. 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 $\int \frac{px+q}{\sqrt{ax^2+bx+c}}$	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
III	**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) $e^{\alpha x}$ (b) $cos\alpha x$ or $sin\alpha x$, where α is a constant (c) x^m (a power of x), m being a positive integer (d) $e^{\alpha x}V$, where V is any function of x	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4
IV	**Numerical Differentiation and Integration** **Introduction:** Newton's forward difference formula to compute derivatives - Newton's backward difference formula to compute derivatives. (Simple Problems Only) The Trapezoidal rule (excluding Truncation error in the Trapezoidal formula) – Simpson's rule (Simple Problems Only)	15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4

V	**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
		15	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4

VI	**Self-Study for Enrichment** **(Not included for End Semester Examination)** Symmetric matrix– Skew symmetric matrix – Hermitian and skew Hermitian matrices –Concavity and Convexity – Linear equation –Simpson's 3/8 rule –Hamiltonian Paths and Circuits.	-	CO1, CO2, CO3, CO4, CO5	K1,K2,K3, K4

Text Books

1. Manichavaschagom Pillay, T.K. Natarajan,T.& Ganapathy, K.S.(2015). *Algebra, Volume II,* S. Viswanathan Pvt Limited.

2. Narayanan, S. & Manicavachagom Pillay, T.K. (2015). *Calculus, Volume I*,   S. Viswanathan (Printers & Publishers) Pvt., Ltd.

3. Narayanan, S. & Manichavaschagom Pillay, T.K. (2015). *Calculus, Volume II,* S.Viswanathan (Printers & Publishers) Pvt., Ltd.

4. Narayanan, S. & Manichavaschagom Pillay, T.K. (2015). *Calculus, Volume III,* S.Viswanathan (Printers & Publishers) Pvt., Ltd.

5. Venkataraman, M.K. (Reprint 2007). *Numerical Methods in Science and Engineering,* The National Publishing Company.

6. Narsingh Deo, (2003). *Graph Theory with applications to Engineering and Computer Science*, Prentice Hall of India Private Limited.

Chapters and Sections

UNIT–I   Chapter 2: Sections 1 to 5, 7, 8, 10 to 16 [1]

UNIT II   Chapter V: Sections 1.1 to 1.5, 2 [2]

            Chapter 1: Sections 7.3, 8 (CASE II) [3]
UNIT-III   Chapter 2: Sections 1 to 4 [4]

UNIT-IV	Chapter IX: Sections 1-3, 8,10 [5]
UNIT-V	Chapter 1: Sections 1.1 to 1.5 [6]
	Chapter 2: Sections 2.1, 2.2, 2.4 to 2.6 [6]

Reference Books

1. Singaravelu, A. (2003). *Allied Mathematics,* A. R. Publications.

2. Vital, P.R. (2014). *Allied Mathematics,* Margham Publications, Chennai.

3. Sastry, S. S. (2018). *Introductory Methods of Numerical Analysis*, PHI Learning Private Limited.

4. Arumugam, S. & Ramachandran. S. (2006). *Invitation to Graph Theory*, Sci Tech Publications (India) Pvt Ltd., Chennai.

Web Links

1. https://youtu.be/rowWM-MijXU

2. https://youtu.be/TQvxWaQnrqI

3. https://youtu.be/pvLj1s7SOtk

4. https://youtu.be/rYq319AOT9E

5. https://youtu.be/RTX-ik_8i-k

6. 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 II

Semester II	Internal Marks: 25			External Marks:75	
COURSE CODE	**COURSE TITLE**		**CATEGORY**	**HRS. / WEEK**	**CREDITS**
23UCG2CC3	**JAVA PROGRAMMING**		**CORE**	**4**	**4**

Course Objective

- To provide the basic OOPs concepts in Java
- To comprehend building blocks of OOPs language, inheritance, package and interfaces
- To identify exception handling methods in Java
- To develop GUI based desktop application in project-based learning

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	Understand OOPs concepts.	K1
CO2	Demonstrate the concept of Object Oriented programming through Java	K2
CO3	Apply the concept of interface, exceptions and threads to develop Java programs	K3
CO4	Develop Java program using Collection Interfaces	K4
CO5	Explain the Java program with Collection Interfaces and Classes	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	3	2	3	2	3	2
CO2	3	3	3	3	3	2	3	2	3	3
CO3	2	3	3	3	3	2	3	2	3	3
CO4	2	3	3	3	3	2	3	2	3	2
CO5	2	3	3	3	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	**Fundamentals of Object-Oriented Programming:** Basic Concepts of Object-Oriented Programming - Benefits and Applications of OOP. **Overview of Java Language:** Java Program Structures, Statements – **Constants, Variables and Data Types:** Constants- Variables – Data Types – Declaration of Variables – Giving Values to Variables – Scope of Variables – Symbolic Constants- Type Casting.	12	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.	12	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 – Abstract Methods and Classes – **Arrays, Strings and Vectors**: Creating Arrays – One and two Dimensional Arrays - Strings. **Interfaces: Multiple Inheritance:** Introduction - Defining Interfaces - Extending Interfaces-Implementation Interfaces - Accessing Interfaces Variables	12	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-	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	**The Collections Framework: The Collection Interfaces:** Collection Interface, List Interface, Set Interface, SortedSet Interface– **The Collection Classes:** ArrayList Class, HashSet Class, TreeSet Class – Stack class	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment** **(Not to be included for End Semester Examination)** History of Java - Installing and Configuring Java- Comment Line Arguments – Enumerated Types - Finalizer Methods. **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.* McGraw Hill Education (India) Pvt. Ltd. – Edition - 6

Reference Book

Herbert Schildt. (2019). *The Complete Reference JAVA.* (11th Edition). McGraw Hill Education (India) Pvt.Ltd.

Web References

1. https://www.slideshare.net/sreedharchowdam1/java-notes-56309340
2. https://sites.google.com/a/rcoe.co.in/computer-programming-ii-java/dashboard/java-notes
3. https://slideplayer.com/slide/13598881/

Pedagogy

Chalk and Talk, Power Point Presentation, Demonstration, e-Content

Course Designer

Dr. S. Latha

Semester II	Internal Marks: 40				External Marks:60
COURSE CODE	COURSE TITLE		CATEGORY	HRS. / WEEK	CREDITS
23UCG2CC2P	JAVA PROGRAMMING (P)		CORE	2	2

Course Objective

- To demonstrate the basic programming components in Java
- To learn how to apply the Object Oriented concepts in Java to develop applications
- To design and develop GUI applications

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	Demonstrate and implement the fundamental OOPs concept	K1,K2
CO2	Apply the reusability and develop the Java program	K3
CO3	Analyze the working of exception handling and threads	K4
CO4	Illustrate of the Collection concept to design Java program	K4
CO5	Design the Java program using Collection classes and interfaces	K5

Mapping of CO with PO and PSO

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

"1"- Slight (Low) Correlation   "2"- Moderate (Medium) Correlation
"3" - Substantial (High) Correlation   "-" - Indicates there is no Correlation

List of Exercises

1. Write a Java Program to overload the constructors and instantiate its object.
2. Write a Java program to practice using String class and its methods.
3. Write a Java Program to implement inheritance and demonstrate use of method overriding.
4. Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods.
5. Write a program to demonstrate use of implementing and extending interfaces.
6. Write a Java program to implement the concept of creating packages and importing classes fromuser defined package.
7. Write a program to implement the concept of Thread Class.
8. Write a program to implement the concept of Exception Handling.
9. Collection Interface
10. Collection Class

Web References

1. https://www.programiz.com/java-programming
2. https://code-exercises.com/
3. https://practity.com/765-2/

Pedagogy
Power Point Presentation and Demonstration.

Course Designer
Dr. S. Latha

Semester II	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	HRS. / WEEK	CREDITS
22UCG2CC4	INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY	CORE	2	2

Course Objective
- To be able to design an Infrastructure Library
- To understand the management principles and its risks in ITIL
- To know the various management practices

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 Rephrase the key concepts of ITIL	K1,K2
CO2	Outline the models of Service Management	K2
CO3	Utilize the various functionalities of Service Management	K3
CO4	Categorize the different types of Management Practices	K4
CO5	Analyze and Explain the Service Management features in Infrastructure Library	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	3	2	3	3	3	3
CO2	3	3	3	2	2	3	3	3	3	3
CO3	3	3	3	2	3	2	2	2	3	3
CO4	3	3	3	3	3	3	2	2	3	3
CO5	3	3	2	2	2	2	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 & Key & concepts of Service management to ITIL 4** **Introduction**: IT Service Management in the modern world - About ITIL v4 - The structure and benefits of the ITIL v4 Framework. **Key Concepts of Service Management:** Value and Value Co-Creation, Stakeholders - Products and Services - Service Relationships and Value.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	**ITIL 4 Dimension Model of IT Service Management** Organization & People: Information & Technology: Partners & Suppliers: Value Streams & Processes - External factors.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	**ITIL Service Value System** Service Value System (SVS) Overview: Opportunity – demand - and Value. Guiding Principles: Focus on value - Think and work holistically - Keep it simple and practical - Optimize and automate - Principle interaction. Service value chain - Continual improvement.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	**ITIL Management Practices:** **General Management Practices** Continual improvement - Information Security management - Knowledge Management - Measurement & reporting - Organizational change Management - Portfolio Management - Project Management - Relationship Management - Risk Management - Service Financial Management - Strategy Management - supplier management - Workforce & talent Management. **Technical Management Practices:** Deployment Management - Infrastructure & Platform - Software development.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

V	**ITIL Management Practices: Service management Practices** Availability management - Business analysis Capacity and performance management - Change control - Incident management - IT asset management - Monitoring and event management - Problem management - Release management - Service catalogue management - Service configuration management - Service continuity management - Service design - Service desk - Service level management -Service request management - Service validation and testing.	6	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	**Self Study for Enrichment** (**Not to be included for End Semester Examination**) Foundation Library-Various levels of Service Management-Benefits and risks of Management Protocols.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Recommended Book

ITIL Foundation v4 Edition 2. Published by TSO (The Stationary Office), part of WILLIAMS LEA

TAG (2019),AXELOS-GLOBAL BEST PRACTICE-ITIL OFFICIAL PUBLISHER. (Online)

Reference Books

1. ITIL For Beginners: The Complete Beginner's Guide to ITIL Edition 2, January 2017.
2. ITIL for Dummies Copyright @ 2012 John Wiley & Sons Ltd., Chichester ,West Sussex, England.

Web References:

1. https://www.google.co.in/books/edition/ITIL_Foundation_ITIL/HmsYwQEACAAJ?hl=en
2. https://www.techtarget.com/searchdatacenter/definition/ITIL
3. https://www.axelos.com/certifications/itil-service-management/

Pedagogy
Chalk & Talk, PowerPoint Presentation, Demonstration, e-Content

Course Designer
TCS

Semester II	Internal Marks:25			External Marks:75
COURSECODE	COURSE TITLE	CATEGORY	HRS. / WEEK	CREDITS
22UCG2AC2	STATISTICS	ALLIED	4	3

CourseObjective

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

CourseOutcomes

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	**Importance,Functions,Limitations:** Importance - Statistics in States – Statistics in Economics – Statistics in Business –Statistics in Astronomy – Statistics in Education – Statistics in Accounting – Statistics in Research – Statistics in Planning–Statistics in Mathematics – Statistics and the Commonman–Statistics Functions of Statistics–Limitations of Statistics. **Diagrammatic Representation:** Introduction– Advantages–Limitations of a Diagram – Rules for Making aDiagram –Types ofDiagram – One Dimensional Diagram – Two dimensional diagram –Three Dimensional Diagram – Pictogram and Cartogram– Selection of a Diagram	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Measures of Central Tendency** Averages–ArithmeticMean–Median–Mode–GeometricMean	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	**Dispersion:** Dispersion–Measures of Dispersion–Coefficients of Dispersion(Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	**Correlation:** Introduction–Meaning of Correlation–Scatter Diagram–Karl Pearson's Co-efficient of Correlation – Rank Correlation (Derivations not needed and Simple Problems Only). **LinearRegression:** Introduction–LinearRegression–Regression Coefficients–Properties of Regression Coefficients(Derivations not needed and Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	**Testing the Hypothesis:**Applications of Chi–SquareDistribution –Goodness of Fittest–Applications oft-distribution– t-test for Single Mean – t-test for difference of Means – Applications of F-distribution – F-test for Equality of two PopulationVariances (Simple Problems Only)	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	**Self Study for Enrichment:** **(Not included for End Semester Examination)** Distrust of Statistics–Fallacies in Statistics – Harmonic Mean –Range, interquartile Range–Rank Correlation(RepeatedRanks)– t-Distribution: Paired t-test for difference of means.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Pillai.R.S.N & Bhagavathi (2008).*Statistics Theory and Practice*. S.Chand & Sons, New Delhi.

2. Gupta.S.C. &V.K.Kapoor. (2014). *Fundamentals of Mathematical Statistics*. Sultan Chand&Sons, New Delhi.

Chapters and Sections

UNIT-I   Chapter 1: Pages(12 – 18)[1]
                Chapter 2: Pages(81 – 99)[1]
UNIT-II   Chapter 2: Sections 2.4 – 2.8 [2]
UNIT-III   Chapter 2: Sections 2.12–2.14[2]
UNIT- IV   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]
UNIT- V   Chapter 15: Sections 15.6(15.6.2 only) [2]
                Chapter 16: Sections 16.3(16.3.1 to 16.3.2) and 16.6(16.6.1 only)[2]

Reference Books

1. Gupta. S.C. &Kapoor. V.K.(2004). *Elements of Mathematical Statistics*. Sultan Chand & Sons, New Delhi.

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://www.youtube.com/watch?v=YGObRCEZiC8**

3. **https://www.youtube.com/watch?v=xZ_z8KWkhXE**

4. **https://www.youtube.com/watch?v=nk2CQITm_eo**

5. **https://www.youtube.com/watch?v=2QeDRsxSF9M**

6. https://rcub.ac.in/econtent/ug/bcom/sem4/Business%20Statistics%20Unit%204%20Correlation%20and%20Regression.pdf

Pedagogy

Power Point Presentation, Group Discussion, Seminar, Assignment.

CourseDesigner

1. Dr. S. Saridha

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	PO 5
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.

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 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.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	**Linear Programming Problem-Simplex Method** Introduction-Fundamental Properties of Solutions-The computational Procedure- The Simplex Algorithm-Use of Artificial Variables-Big 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-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). **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 -	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

	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 PVTLtd.

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 HousePVT 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