FATIMA COLLEGE (AUTONOMOUS)

Re-Accredited with "A++" Grade by NAAC (4th Cycle)

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : INFORMATION TECHNOLOGY

NAME OF THE PROGRAMME : M.Sc

PROGRAMME CODE : PSIT

ACADEMIC YEAR : 2022-2023

M.Sc INFORMATION TECHNOLOGY

Minutes of the meeting of the Board of Studies for M.Sc IT held at Department of Information Technology on 16.8.22

Members present.

1. Dr. G. Sumathi, Head
Department of computer science,
Sri Meenakshi Government Arts college for women
Madurai

2. Dr. K. Kungumaraj, Head
PG Department of computer Science,
Arulmigu palaniandavar Arts college for women,
palani

3. Sr. Jothi, Head
Department of computer Science,
Holy cross college,
Nagercoil — Absent

4. Mrs. M. Thilagavathi madhavan,
Senior programmer Analyst,
Aparajitha Corporate Service pvt. Ltd.,
Madurai

5. Ms. P.G. poornimadevi, Faculty,
Dolphin Elite school,
Madurai

Mr. A. Mabbe Jasmine Shobha - A. Mabbe Jasmine Shobha
Mrs. V. Mageshwari - V.
Mrs. T. Leena prema kumari - T.
Mrs T. Charanya Nagammal - T. Charanya
Dr. V. Janevaramani sulekha - V.J.V. sulekha.
Dr. N. Kalaichelvi - N. Kalai
Mrs. I. Razul Beevi - I. Razul

I. ACTION TAKEN REPORT:

The Action Taken Report for the academic year 2021-22 was presented to the board members as.

Suggestions	Action taken
* In JAVA Lab, the J2ME programs has to be included	As suggested, the topics has been included.
* Database connectivity concepts has to be included in python	Suggested topic has been included.

Change of course title :- NIL

Revised course:

S.NO.	COURSE CODE	COURSE TITLE	REVISED CONTENT	% OF REVISION	NEED FOR REVISION	RELEVANCE TO L	R	N	G	SCOPE FOR EMP	ENT S
1.	21PGIIT5	JAVA & J2ME LAB	programs using J2ME is introduced	15%	Members suggestions				✓		✓
2.	21PG3IT13	python programming	Database connectivity concepts are introduced	20%	Board Members suggestion				✓		✓

NEW COURSES INTRODUCED

S NO	COURSE CODE	COURSE TITLE	RELEVANCE TO				SCOPE FOR			NEED FOR INTRODUCTION
			L	R	N	Q	EMP	ENT	SD	
1.	21PS1IT1	JAVA & J2ME				✓	✓			Industrial Requirements
2.	21PS1IT2	Soft Computing				✓			✓	Industrial Requirement
3.	21PS1IT3	Data Managent Using R programg				✓	✓			IT field Requirement
4.	21PS2IT7	Data science				✓			✓	IT requirement
5.	21PS2ITE1	Adhoc network				✓			✓	Impart skills on network
6.	21PS2ITE2	Machine Learning				✓	✓			Gain knowledge on Machine Learning
7.	21PS2ITE3	Cyber Security				✓			✓	Create awareness on Security.
8.	21PS3ITE5	Ethical Hacking				✓	✓			To know more about Etrical hacking.
9.	21PS3ITE6	Computer forensics				✓			✓	Impart skills.
10.	21PS4ITI6	Biometrics				✓			✓	Impart Biometric skills
11.	21PSCAISLI	Supply Chain management				✓	✓			Industrial Requirement.
12.	21PS22TSL1	Linux shell programming				✓	✓			Industrial Requirement

S.NO.	COURSE CODE	COURSE TITLE	RELEVANCE TO L	R	N	G	SCOPE FOR EMP	ENT	SD	NEED FOR INTRODUCTION
13.	21PG3ITSL1	Research Methodology				✓			✓	To Impart the importance of research.
14.	21PG4ITSL1	Artificial Intelligence				✓			✓	Industrial Requirement.

II. DOER:

II. Updation of Digital Open Educational Resources in the list of references of each course has been presented in the following format.

S.NO.	COURSE CODE	COURSE TITLE	DETAILS OF UPDATION.
	–	–	–

III. REVISION OF COURSES:

S.NO.	COURSE CODE	COURSE TITLE	REVISED CONTENT	NEED FOR REVISION	% OF REVISION	RELEVANCE TO L	R	N	G	SCOPE FOR EMP	ENT	S
1.	21PG1IT4	Distributed Operating System	RPC model & its Transpancy has removed.	members suggestion	2%.				✓	✓		
2.	21PG2IT7	cyber Security	classification of cybercrime has removed.	members Suggestion	5%.				✓	✓		
3.	21PG1IT1	Java 2 J2ME	Advanced Concept included in unit 5 Canva is removed	member suggestion	5%				✓	✓		

COURSE CODE	COURSE TITLE	REVISED CONTENT	NEED FOR REVISION	% OF REVISION	RELEVANCE TO L	D	N	S	Emp	Ent	SDG
21PS2IT8	Digital Image Processing	Segmentation has included	Members suggestion	5%				✓	✓		
21PS2IT10	Lab in Image Processing	Segmentation has been included	Members suggestion	5%				✓	✓		
21PS3IT12	Data Mining & Data warehousing	Complex data & society concepts included.	Members suggestions	5%				✓	✓		
21PS3IT13	Advanced Python programming	Contents Shuffled in unit I & V	Members suggestion	20%				✓	✓		
22PS3ITE4	Software Testing	Contents Changed in all units	Members suggestion	90%				✓			✓
21PS3ITE6	Computer forensics	contents Changed in unit V	Members suggestions	15%				✓			✓
21PS3ITE8	Internet of Things	unit III & IV content changed	members suggestion	40%				✓			✓
22PS2IT9	Android programming	Contents Changed in all units	Members suggestion	80%				✓	✓		

V. Introduction of purely Skill - Embedded certificate / Diploma / Advanced Diploma value-added course other than the value-added course that is already being offered - NIL

IV. NEW COURSES INTRODUCED:

COURSE CODE	COURSE TITLE	RELEVANCE TO L	R	N	S	SCOPE FOR Em	Et	Sd	NEED FOR INTRODUCTION
22PS1IT3	Data science using R-programming				✓	✓			Board members suggestion
22PS1IT6	Lab: Data science using R programming				✓	✓			Industrial Requirement
22PS1IT2EX	Advanced Excel VBA				✓	✓			To be offered to other discipline students
22PS3ITE5	System Software & Compiler Design				✓	✓			Industrial need.
22PS3ITE9	Algorithm Design and Analysis				✓	✓			Industrial need.
22PS4ITI6	Software Project Management				✓		✓		Members suggested
22PS2ITE3	Ethical Hacking				✓	✓			Industrial Requirement.

V. RUBRICS FOR INTERNSHIP / PROJECT:

C1 (20 mks)	C2 (20 mks)	CIA TOTAL 40 mks	EXTERNAL 60 mks
Review I:	Review II:		* presentation
* Selection	* Presentation	C1 + C2	* Implement
* Presentation	* Completion		

VII. DETAILS OF PROPOSED MOU:

* proposal for signing an MOU with Winways Solutions, Madurai.

VIII: COMMENDATIONS:

* Board Members appreciated the syllabus, as it covers all the required courses for Information Technology field.

SEMESTER I:

21PG1IT1 - Java & J2ME
21PG1IT2 - Soft computing
22PG1IT3 - Data Science using R programming
21PG1IT4 - Distributed operating System
21PG1IT5 - Lab 1: Java & J2ME
22PG1IT6 - Lab 2: Data Science using R programming
19PG1IT1EDC - Animation Software.

SEMESTER II:

21PG2IT7 - Cyber Security.
21PG2IT8 - Digital Image Processing
22PG2IT9 - Android programming
21PG2IT10 - Lab 3: Image processing.
21PG2IT11 - Lab 4: Android programming
22PG1IT2EDC - Advanced Excel VBA.
21PG2ITE1 / E2 / 22PG2ITE3 - Adhoc Network / Machine Learning / Ethical Hacking.

SEMESTER III:

21PG3IT12 - Data Mining and Data Warehousing
21PG3IT13 - Advanced python programming.
21PG3IT14 - Lab 5: Data Mining and Data Warehousing
21PG3IT15 - Lab 6: Advanced python programming
21PG3ITE4 / 22PG3ITE5 / 21PG3ITE6 - Software Testing / System Software & Compiler Design / Computer Forensics.
21PG3ITE7 / 21PG3ITE8 / E9 - Big Data Analytics / Internet of Things / 22PG3ITE9 - Algorithm Design and Analysis
19PG3II5I - Summer Internship.

SEMESTER IV:

21PG4IT16 - Biometrics
19PG4ITPR - Project & Viva voce.

* Advanced HTML 5 as Computer Application Course for IPG IT.

Members:

Dr. G. Sumathi - 16/3/22

Dr. K. Kungumaraj -

Sr. Jotci - Absent

Mrs. M. Thilagavathi Madhavan -

Mrs. T. G. Poornima devi -

Mrs. A. Mabel Jasmine Shobha -

Mrs. V. Mageshwari -

Mrs. T. Leena prema Kumari -

Mrs. T. Charanya Nagammal -

Dr. V. Jane varamani Sulekha -

Dr. N. Kalaichelvi -

Mrs. I. Razul Beevi -

16/3/2022

VISION OF THE DEPARTMENT

The vision is to be the center of excellence in training the students in Information Technology to excel both as a professional and as a responsible woman in the society.

MISSION OF THE DEPARTMENT

- Empower women by teaching them technology and life lessons.
- Encourage students to be the change in the society.
- Educate students and prepare them in various aspects of IT industry.
- Provide leadership quality for effective strategic and tactical planning in use of technology.
- Instill the power of faith and hope so they could be the blessing to their next generation.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

A graduate of M.Sc. Information Technology programme after two years will be

PEO 1	Our graduates will be academic, digital and information literates, creative, inquisitive, innovative and committed researchers who would be desirous for the "more" in all aspects
PEO 2	They will be efficient individual and team performers who would deliver excellent professional service exhibiting progress, flexibility, transparency, accountability and in taking up initiatives in their professional work

PEO 3	The graduates will be effective managers of all sorts of real – life and professional circumstances, making ethical decisions, pursuing excellence within the time framework and demonstrating apt leadership skills
PEO 4	They will engage locally and globally evincing social and environmental stewardship demonstrating civic responsibilities and employing right skills at the right moment.

GRADUATE ATTRIBUTES (GA)

Fatima College empowers her women graduates holistically. A Fatimite achieves all-round empowerment by acquiring Social, Professional and Ethical competencies. A graduate would sustain and nurture the following attributes:

I. SOCIAL COMPETENCE	
GA 1	Deep disciplinary expertise with a wide range of academic and digital literacy
GA 2	Hone creativity, passion for innovation and aspire excellence
GA 3	Enthusiasm towards emancipation and empowerment of humanity
GA 4	Potentials of being independent
GA 5	Intellectual competence and inquisitiveness with problem solving abilities befitting the field of research
GA 6	Effectiveness in different forms of communications to be employed in personal and professional environments through varied platforms
GA 7	Communicative competence with civic, professional and cyber dignity and decorum
GA 8	Integrity respecting the diversity and pluralism in societies, cultures and religions

GA 9	All – inclusive skill sets to interpret, analyse and solve social and environmental issues in diverse environments
GA 10	Self awareness that would enable them to recognise their uniqueness through continuous self-assessment in order to face and make changes building on their strengths and improving their weaknesses
GA 11	Finesse to co-operate exhibiting team-spirit while working in groups to achieve goals
GA 12	Dexterity in self-management to control their selves in attaining the kind of life that they dream for
GA 13	Resilience to rise up instantly from their intimidating setbacks
GA 14	Virtuosity to use their personal and intellectual autonomy in being life-long learners
GA 15	Digital learning and research attributes
GA 16	Cyber security competence reflecting compassion, care and concern towards the marginalised
GA 17	Rectitude to use digital technology reflecting civic and social responsibilities in local, national and global scenario
II. PROFESSIONAL COMPETENCE	
GA 18	Optimism, flexibility and diligence that would make them professionally competent
GA 19	Prowess to be successful entrepreuners and become employees of trans-national societies
GA 20	Excellence in Local and Global Job Markets
GA 21	Effectiveness in Time Management
GA 22	Efficiency in taking up Initiatives
GA 23	Eagerness to deliver excellent service
GA 24	Managerial Skills to Identify, Commend and tap Potentials
III. ETHICAL COMPETENCE	

GA 25	Integrity and be disciplined in bringing stability leading a systematic life promoting good human behaviour to build better society
GA 26	Honesty in words and deeds
GA 27	Transparency revealing one's own character as well as self-esteem to lead a genuine and authentic life
GA 28	Social and Environmental Stewardship
GA 29	Readiness to make ethical decisions consistently from the galore of conflicting choices paying heed to their conscience
GA 30	Right life skills at the right moment

PROGRAMME OUTCOMES (PO)

The learners will be able to

PO 1	Apply acquired scientific knowledge to solve major and complex issues in the society/industry.
PO 2	Attain research skills to solve complex cultural, societal and environmental issues.
PO 3	Employ latest and updated tools and technologies to solve complex issues.
PO 4	Demonstrate Professional Ethics that foster Community, Nation and Environment Building Initiatives

PROGRAMME SPECIFIC OUTCOMES (PSO)

On completion of M.Sc.IT programme, the graduates would be able to

PSO 1	Understand the concepts and applications in the field of Information Technology like Web designing and development, Mobile application development, and Network communication technologies.
PSO 2	Ability to understand the structure and development methodologies of software systems.
PSO 3	Apply the learning from the courses and develop applications for real world problems.
PSO 4	Understand the technological developments in the usage of modern design and development tools to analyze and design for a variety of applications.
PSO 5	Familiarity and practical competence with a broad range of programming language and open source platforms.
PSO 6	Demonstrate the understanding of the principles and working of the hardware and software aspects of computer systems
PSO 7	Possess professional skills and knowledge of software design process.
PSO 8	Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.
PSO 9	Communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAMME CODE: PSIT

COURSE CODE	COURSE TITLE	HRS / WK	CREDIT	CIA Mks	ESE Mks	TOT. MKs
SEMESTER - I						
21PG1IT1	Java & J2ME	4	4	40	60	100
21PG1IT2	Soft computing	4	4	40	60	100
22PG1IT3	Data Science using R-Programming	4	4	40	60	100
21PG1IT4	Distributed Operating System	4	4	40	60	100
21PG1IT5	Lab in Java & J2ME	5	3	40	60	100
22PG1IT6	Lab in Data Science using R-Programming	5	3	40	60	100
	Library	1	-	-	-	-
Total		**27**	**22**			
SEMESTER - II						
21PG2IT7	Cyber Security	4	4	40	60	100
21PG2IT8	Digital Image Processing	4	4	40	60	100
22PG2IT9	Android Programming	4	4	40	60	100
21PG2IT10	Lab in Image Processing	5	3	40	60	100
21PG2IT11	Lab in Android Programming	5	3	40	60	100

COURSE CODE	COURSE TITLE	HRS / WK	CREDIT	CIA Mks	ESE Mks	TOT. MKs
	Library	1		-	-	-
Total		**23**	**18**			
SEMESTER - III						
21PG3IT12	Data Mining and Data Warehousing	5	5	40	60	100
21PG3IT13	Advanced Python Programming	5	5	40	60	100
21PG3IT14	Lab 5 Data Mining and Data Warehousing	5	3	40	60	100
21PG3IT15	Lab 6 Advanced Python Programming	5	3	40	60	100
Total		**20**	**16**			
SEMESTER - IV						
21PG4IT16	Biometrics	-	4	40	60	100
Total		**-**	**4**			
	Total	**120**	**60**			

MAJOR ELECTIVE / EXTRA DEPARTMENTAL COURSE / INTERNSHIP/ PROJECT

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. Mks
1.	I	19PGIT1EDC	EDC 1 Animation Software	3	3	40	60	100
2.	II	22PGIT2EDC	EDC 2 Advanced Excel VBA	3	3	40	60	100
3.			Elective - I 21PG2ITE1 Adhoc Network 21PG2ITE2 Machine Learning 21PG2ITE3 Ethical Hacking	4	5	40	60	100
4.	III		Elective - II 22PG3ITE4 Software Testing 22PG3ITE5 System Software & Compiler Design 21PG3ITE6 Computer Forensics	5	5	40	60	100
5.			Elective - III 21PG3ITE7 Big Data Analytics 21PG3ITE8 Internet of Things 22PG3ITE9 Algorithm Design and Analysis	5	5	40	60	100
6.		21PG3ITSI	Summer Internship	-	3	40	60	100
7.	IV	19PG4ITPR	Project	-	6	40	60	100
			TOTAL	**20**	**30**			

OFF-CLASS PROGRAMME

ADD-ON COURSES

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
	SOFT SKILLS	40	4	I	40	60	100
	COMPUTER APPLICATIONS (Dept. Specific Course)	40	4	II	40	60	100
	MOOC COURSES (Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM /UGC /CEC	-	Minimum 2 Credits	-	-	-	
	COMPREHENSIVE VIVA (Question bank to be prepared for all the papers by the respective course teachers)	-	2	IV	-	-	100
	READING CULTURE	15/ Semester	1	I-IV	-	-	-

	TOTAL		13 +				

EXTRA CREDIT COURSE

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED	CIA MKS	ESE MKS	TOTAL MARKS
	SELF LEARNING COURSE for ADVANCED LEARNERS **SUPPLY CHAIN MANAGEMENT**	-	2	I	40	60	100
21PG3ITSL3	**SELF LEARNING COURSES for ADVANCED LEARNERS** **Research Methodology**	-	2	III	40	60	100
	MOOC COURSES / International Certified online Courses (Department Specific Courses/any other courses) * Students can opt other than	-	Minimum 2 Credits	I – IV	-	-	

	the listed course from UGC-SWAYAM /UGC /CEC						

- **Lab Courses :**
  - A range of 10-15 experiments per semester

- **Summer Internship:**
  - Duration-1 month (2nd Week of May to 2nd week of June-before college reopens)

- **Project:**
  - Off class
  - Evaluation components-Report writing + Viva Voce (Internal marks-50) + External marks 50

- **EDC:**

  Syllabus should be offered for two different batches of students from other than the parent department in Sem-I & Sem-II

OLD SYLLABUS

Deletion 5%

I M.Sc.IT

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT1	JAVA & J2ME	Lecture	4	4

COURSE DESCRIPTION

This course provides various techniques of Java Programming and help them to create effective programs in this language.

COURSE OBJECTIVES

This course is aimed to apply variety of technologies in JAVA for different platforms.

UNITS

UNIT –I INTRODUCTION& BASIC CONCEPTS (11 HRS.)

Java Program Structure-Java Tokens-Java Statements- Implementing a Java Program-Java Virtual machine. Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-Creating Packages- Accessing a Package- Using a Package- Adding a Class to a Package- Hiding Classes Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle- Creating an Executable Applet- Designing a web page- Applet Tag- Adding Applet to HTML File- Running the Applet- More about Applet Tag- Passing Parameters to Applets- Aligning the Display – More About HTML

Tags- **Displaying Numerical Values- Getting input from the user (Self Study)**

UNIT –II SWINGS (11Hrs)

GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers – Swing Packages – Event Handling – Swing Applet – Painting in Swing.

Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons – JTabbedPane – **JScrollPane – JList – JComboBox – Trees – JTable (Self Study)**.

UNIT –III: JDBC (12 Hrs)

JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program – Performing Batch Updates – Using Save points - Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data sources-**Revisiting DBProcessor-Using the RowSet Interface (Self Study)**

UNITIV : J2ME Overview (12 Hrs)

Inside J2ME - J2ME and Wireless devices – J2ME Architecture – MIDlet Programming- J2ME Software development kits – J2ME Style- Multiple MIDlets- J2ME wireless toolkit.

UNIT V : J2ME UI (12 Hrs) 5%

Commands- Items- Event Processing- High level Display : Screens – Low level Display :Canvas

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 Hrs)

Implementation of Real-time application using JAVA

REFERENCES:

1. E. Balagurusamy, "Programming with JAVA", TataMcGraw-Hill Publications, 2015, 5th Edition.
2. ***Java The Complete Reference,*** Herbert Schildt 9thEdition, McGraw Hill Education, 2016.
   Chapters: 22, 30, 31, 32, 33,38
3. ***James McGovern***, Rahim Adatia and others, ***J2EE 1.4 Bible,*** 1st Edition, Wiley India (P) Ltd, (2008). Chapters: 6,7,18
4. Philip Heller and Simon Roberts, "JAVA 2 Developer's Handbook", BPB Publications, 2000
5. C.Xavier , "Projects on JAVA", SCITECH Publications
6. Cay S. HorstmannGaryCornell,"Core Java Volume I fundamentals" , Pearson Education, 2008, Eigth edition.
7. Jamie Jaworski, "Java 2 Platform Unleashed" , Techmedia Publications, 1999

Digital Open Educational Resources

(DOER):https://www.tutorialspoint.com/java/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION & BASIC CONCEPTS**			
1.1	Java Program Structure-Java Tokens-Java Statements-Implementing a Java Program-Java Virtual machine	1	Chalk & Talk	Black Board
1.2	Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-Creating Packages- Accessing a Package- Using a Package-Adding a Class to a Package-Hiding Classes .	1	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.3	Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle-	4	Lecture	PPT & White board
1.4	Creating an Executable Applet- Designing a web page- Applet Tag-Adding Applet to HTML File- Running the Applet-	2	Lecture	Smart Board
1.5	More about Applet Tag- Passing Parameters to Applets- Aligning the Display – More About HTML Tags	2	Lecture	Black Board
1.6	Displaying Numerical Values- Getting input from the user(Self Study)	1	Discussion	Google classroom
UNIT -2 SWINGS				
2.1	GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers	1	Lecture	Green Board Charts
2.2	– Swing Packages – Event Handling – Swing Applet – Painting in Swing	3	Chalk & Talk	Green Board
2.3	Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons- JTabbedPane	3	Chalk & Talk	Green Board
2.4	JScrollPane – JList – JComboBox-Trees – JTable(self study)	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT –III: JDBC				
3.1	JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program	3	Chalk & Talk	Black Board
3.2	Performing Batch Updates – Using Save points -	3	Chalk & Talk	LCD
3.3	Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data source	3	Lecture	Smart Board
3.4	**Revisiting DB Processor-Using the Row Set Interface (Self Study)**	2	Discussion	Google Classroom
UNIT IV : J2ME Overview				
4.1	Inside J2ME - J2ME and Wireless devices	3	Chalk & Talk	Black Board
4.2	J2ME Architecture – MIDlet Programming	3	Lecture	Smart Board
4.3	J2ME Software development kits – J2ME Style.	3	Chalk & Talk	LCD
4.4	Multiple MIDlets - J2ME wireless toolkit	3	Discussion	Google Classroom
UNIT V : J2ME UI				
5.1	Commands- Items-	3	Lecture	Smart Board
5.2	Event Processing	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	High level Display : Screens	3	Chalk & Talk	LCD
5.4	Low level Display :Canvas	3	Chalk & Talk	LCD
UNIT -6 DYNAMISM				
6.1	Implementation of Real-time application	3	Assignment & Group discussion	PPT

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %

Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

		Nos			
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	To understand the structure and model of the Java programming language.	K2	PSO1, PSO4
CO 2	To explain the concepts of Packages, Interfaces and strings.	K2, K3	PSO4, PSO5
CO 3	To develop software implementing Exception handling mechanisms	K3, K4	PSO3, PSO6
CO 4	To design software for database connectivity and able to design GUI applications	K3, K4	PSO3, PSO9
CO 5	To implement server side	K4, K5	PSO6, PSO8

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
	programming using SERVLETS		

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Mrs. V. Mageshwari**

Forwarded By

V. Mageshwari

HOD'S Signature& Name

NEW SYLLABUS

Insertion 5%

I M.Sc.IT

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT1	JAVA & J2ME	Lecture	4	4

COURSE DESCRIPTION

This course provides various techniques of Java Programming and help them to create effective programs in this language.

COURSE OBJECTIVES

This course is aimed to apply variety of technologies in JAVA for different platforms.

UNITS

UNIT –I INTRODUCTION& BASIC CONCEPTS (11 HRS.)

Java Program Structure-Java Tokens-Java Statements- Implementing a Java Program-Java Virtual machine. Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-Creating Packages- Accessing a Package- Using a Package- Adding a Class to a Package- Hiding Classes Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle- Creating an Executable Applet- Designing a web page- Applet Tag- Adding Applet to HTML File- Running the Applet- More about Applet Tag-

Passing Parameters to Applets- Aligning the Display – More About HTML Tags- **Displaying Numerical Values- Getting input from the user (Self Study)**

UNIT –II SWINGS (11Hrs)

GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers – Swing Packages – Event Handling – Swing Applet – Painting in Swing.

Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons – JTabbedPane – **JScrollPane – JList – JComboBox – Trees – JTable (Self Study)**.

UNIT –III: JDBC (12 Hrs)

JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program – Performing Batch Updates – Using Save points - Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data sources-**Revisiting DB Processor-Using the Row Set Interface (Self Study)**

UNIT IV : J2ME Overview (12 Hrs)

Inside J2ME - J2ME and Wireless devices – J2ME Architecture – MIDlet Programming- J2ME Software development kits – J2ME Style- Multiple MIDlets- J2ME wireless toolkit.

UNIT V : J2ME UI (12 Hrs) 5%

Commands- Items- Event Processing- High level Display : Screens – JDBC objects

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 Hrs)

Implementation of Real-time application using JAVA

REFERENCES:

8. E. Balagurusamy, "Programming with JAVA", TataMcGraw-Hill Publications, 2015, 5th Edition.
9. ***Java The Complete Reference,*** Herbert Schildt 9thEdition, McGraw Hill Education, 2016.
Chapters: 22, 30, 31, 32, 33,38
10. ***James McGovern***, Rahim Adatia and others, ***J2EE 1.4 Bible,*** 1st Edition, Wiley India (P) Ltd, (2008). Chapters: 6,7,18
11. Philip Heller and Simon Roberts, "JAVA 2 Developer's Handbook", BPB Publications, 2000
12. C.Xavier , "Projects on JAVA", SCITECH Publications
13. Cay S. HorstmannGaryCornell,"Core Java Volume I fundamentals" , Pearson Education, 2008, Eigth edition.
14. Jamie Jaworski, "Java 2 Platform Unleashed" , Techmedia Publications, 1999

Digital Open Educational Resources

(DOER):https://www.tutorialspoint.com/java/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION & BASIC CONCEPTS**			
1.1	Java Program Structure-Java Tokens-Java Statements-Implementing a Java Program-Java Virtual machine	1	Chalk & Talk	Black Board
1.2	Packages: Introduction- Java API Packages- Using System Packages- Nesting Conventions-Creating Packages- Accessing a Package- Using a Package-Adding a Class to a Package-Hiding Classes .	1	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.3	Applet Programming: Introduction- How Applets Differ from Applications- Preparing to Write Applets – Building Applet Code- Applet Life Cycle-	4	Lecture	PPT & White board
1.4	Creating an Executable Applet- Designing a web page- Applet Tag-Adding Applet to HTML File- Running the Applet-	2	Lecture	Smart Board
1.5	More about Applet Tag- Passing Parameters to Applets- Aligning the Display – More About HTML Tags	2	Lecture	Black Board
1.6	Displaying Numerical Values- Getting input from the user(Self Study)	1	Discussion	Google classroom
UNIT -2 SWINGS				
2.1	GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers	1	Lecture	Green Board Charts
2.2	– Swing Packages – Event Handling – Swing Applet – Painting in Swing	3	Chalk & Talk	Green Board
2.3	Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons- JTabbedPane	3	Chalk & Talk	Green Board
2.4	JScrollPane – JList – JComboBox-Trees – JTable(self study)	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT –III: JDBC				
3.1	JDBC- Java Database Connectivity: Introducing JDBC Driver Types - Creating Your First First JDBC Program	3	Chalk & Talk	Black Board
3.2	Performing Batch Updates – Using Save points -	3	Chalk & Talk	LCD
3.3	Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data source	3	Lecture	Smart Board
3.4	**Revisiting DB Processor-Using the Row Set Interface (Self Study)**	2	Discussion	Google Classroom
UNIT IV : J2ME Overview				
4.1	Inside J2ME - J2ME and Wireless devices	3	Chalk & Talk	Black Board
4.2	J2ME Architecture – MIDlet Programming	3	Lecture	Smart Board
4.3	J2ME Software development kits – J2ME Style.	3	Chalk & Talk	LCD
4.4	Multiple MIDlets - J2ME wireless toolkit	3	Discussion	Google Classroom
UNIT V : J2ME UI				
5.1	Commands- Items-	3	Lecture	Smart Board
5.2	Event Processing	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	High level Display : Screens	3	Chalk & Talk	LCD
5.4	JDBC objects	3	Chalk & Talk	LCD
UNIT -6 DYNAMISM				
6.1	Implementation of Real-time application	3	Assignment & Group discussion	PPT

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

  Nos

  C1 - Test (CIA 1) 1 - 10 Mks

C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	To understand the structure and model of the Java programming language.	K2	PSO1, PSO4
CO 2	To explain the concepts of Packages, Interfaces and strings.	K2, K3	PSO4, PSO5
CO 3	To develop software implementing Exception handling mechanisms	K3, K4	PSO3, PSO6
CO 4	To design software for database connectivity and able to design GUI applications	K3, K4	PSO3, PSO9
CO 5	To implement server side programming using SERVLETS	K4, K5	PSO6, PSO8

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

2. **Mrs. V. Mageshwari**

Forwarded By

V. Mageshwari

HOD'S Signature& Name

OLD SYLLABUS

Deletion 2%

I M.Sc.

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT4	DISTRIBUTED OPERATING SYSTEM	PG Core	4 Hrs.	4

COURSE DESCRIPTION

To understand the concept of design and implementation in the context of distributed operating systems.

COURSE OBJECTIVES

To apply the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

To recognize the inherent difficulties that arise due to distribution of computing resources.

UNITS

UNIT –I INTRODUCTION (10 Hrs)

Fundamentals – Distributed computing systems – Evolution of distributed computing systems – Distributed computing system models – Popularity of distributed computing systems – Distributed operating system – **issues in designing a distributed operating system– Introduction to distributed computing environment(DCE)(Self Study)**.

UNIT –II MESSAGE PASSING (11 Hrs) 2%

Message Passing – Introduction – Desirable features of a good message-passing system – Issues in IPC by message passing – Synchronization – Buffering – Multi datagram messages – Remote Procedure Calls – Introduction – The RPC model – Transparency of RPC – Implementing RPC mechanism.

UNIT –III DISTRIBUTED SHARED MEMORY (12 Hrs)

Distributed Shared Memory – Introduction – General architecture of DSM systems – Design and implementation issues of DSM – Synchronization – Introduction – Clock synchronization – Election Algorithms. **Resource Management – Introduction – Desirable features of a good global scheduling algorithm – load sharing approach. (Self Study)**

UNIT –IV PROCESS MANAGEMENT (12 Hrs)

Process Management – Introduction – Process migration - Distributed File Systems – Introduction – Desirable features of a good distributed file system – File models– File-Accessing models – File-Sharing semantics – **File-Caching schemes – File replication – Fault tolerance. (Self Study)**

UNIT –V LINUX (12 Hrs)

The Linux Shell and File Structure: The Shell – The Command Line – History – Filename Expansion – Standard Input/Output and Redirection – Pipes – Ending Processes – The shell scripts and Programming –Shell Variables – Shell Scripts – Environment Variables and Subshells – Control Structures – **TCSH/C Shell Control structures.(Self Study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 Hrs.)

Analysis of different types of Operating systems in real time applications.

REFERENCES:

1. ***Distributed Operating Systems Concepts and Design,*** Pradeep K. Sinha, Prentice Hall of India Private Limited, 2012.
2. Linux: The Complete Reference, Richard Petersen, McGraw Hill Education (India) Private Limited, 6th Edition, 2011.
3. ***Operating Systems,*** Stuart Madnick, John Donovan, McGraw Hill Education, 2012.
4. ***Distributed Operating Systems***, Andrew S. Tanenbaum, Pearson Education, New Delhi, 2013.
5. ***Beginning Linux Programming,*** Neil Matthew, Richard Stones, Wiley India Pvt. Ltd, 2014

OPEN EDUCATIONAL RESOURCES :

1. https://www.tutorialspoint.com/operating_system/index.htm

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Fundamentals – Distributed computing systems	1	Chalk & Talk	Black Board
1.2	Evolution of distributed computing systems	2	Chalk & Talk	LCD
1.3	Distributed computing system models – Popularity of distributed computing systems	4	Lecture	PPT & White board
1.4	Distributed operating system – Issues in designing a distributed operating system(Self Study)	1	Discussion	Google Classroom
1.5	Introduction to distributed computing environment(DCE)	2	Lecture	Black Board
UNIT -2 MESSAGE PASSING				
2.1	Introduction – Desirable features of a good message-passing system	1	Lecture	Green Board Charts
2.2	Issues in IPC by message passing – Synchronization – Buffering	2	Chalk & Talk	Green Board
2.3	Multidatagram messages – Remote Procedure Calls	3	Chalk & Talk	Black Board
2.4	Introduction – The RPC model – Transparency of RPC	3	Chalk & Talk	Black Board
2.5	Implementing RPC mechanism	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -3DISTRIBUTED SHARED MEMORY				
3.1	Introduction – General architecture of DSM systems	3	Chalk & Talk	Black Board
3.2	Design and implementation issues of DSM	3	Lecture	Green Board Charts
3.3	Synchronization – Introduction – Clock synchronization – Election Algorithms.	3	Chalk & Talk	Black Board
3.4	Resource Management – Introduction – Desirable features of a good global scheduling algorithm – load sharing approach. (Self Study)	3	Discussion	Google Classroom
UNIT -4PROCESS MANAGEMENT				
4.1	Introduction – Process migration	2	Chalk & Talk	Black Board
4.2	Distributed File Systems – Introduction – Desirable features of a good distributed file system	3	Lecture	Green Board
4.3	File models– File-Accessing models	3	Chalk & Talk	Black Board
4.4	File-Sharing semantics	2	Lecture	Green Board
4.5	File-Caching schemes – File replication – Fault tolerance. (Self Study)		Discussion	Google Classroom
UNIT -5LINUX				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.1	The Shell – The Command Line – History – Filename Expansion	3	Chalk & Talk	Black Board
5.2	Standard Input/Output and Redirection – Pipes – Ending Processes	3	Lecture	Green Board
5.3	The shell scripts and Programming –Shell Variables	3	Chalk & Talk	Black Board
5.4	Shell Scripts – Environment Variables and Sub shells - Control Structures	2	Chalk & Talk	Black Board
5.5	TCSH/C Shell Control structures.(Self Study)	1	Discussion	Google Classroom
UNIT -6DYNAMISM				
6.1	Analysis of different types of Operating systems in real time applications.	3	Assignment submission	Google Classroom

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average	Better of W1, W2	M1+M2	MID-SEM TEST				

	5 Mks.	5+5=10 Mks.	15 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the core concepts of distributed systems.	K2	PSO1, PSO2
CO 2	Analyze various message passing mechanisms with its model.	K2, K4	PSO4,PSO6
CO 3	Identify the inherent difficulties that arise due to distribution of computing resources.	K3& K4	PSO3,PSO6
CO 4	Explain migration with the process management policies.	K2, K3	PSO2,PSO5
CO 5	Explain the basic concepts, design and structure of the LINUX operating system.	K2 & K4	PSO4,PSO6

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Mrs. T. Leena Prema Kumari**

HOD'S Signature & Name

Forwarded By

NEW SYLLABUS

I M.Sc.

SEMESTER –I

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG1IT4	DISTRIBUTED OPERATING SYSTEM	PG Core	4 Hrs.	4

COURSE DESCRIPTION

To understand the concept of design and implementation in the context of distributed operating systems.

COURSE OBJECTIVES

To apply the concepts of distributed systems in designing large systems, and will additionally apply these concepts to develop sample systems.

To recognize the inherent difficulties that arise due to distribution of computing resources.

UNITS

UNIT –I INTRODUCTION (10 Hrs)

Fundamentals – Distributed computing systems – Evolution of distributed computing systems – Distributed computing system models – Popularity of distributed computing systems – Distributed operating system – **issues in designing a distributed operating system– Introduction to distributed computing environment(DCE)(Self Study)**.

UNIT –II MESSAGE PASSING (11 Hrs)

Message Passing – Introduction – Desirable features of a good message-passing system – Issues in IPC by message passing – Synchronization – Buffering – Multi datagram messages – Remote Procedure Calls – Introduction – Implementing RPC mechanism.

UNIT –III DISTRIBUTED SHARED MEMORY (12 Hrs)

Distributed Shared Memory – Introduction – General architecture of DSM systems – Design and implementation issues of DSM – Synchronization – Introduction – Clock synchronization – Election Algorithms. **Resource Management – Introduction – Desirable features of a good global scheduling algorithm – load sharing approach. (Self Study)**

UNIT –IV PROCESS MANAGEMENT (12 Hrs)

Process Management – Introduction – Process migration - Distributed File Systems – Introduction – Desirable features of a good distributed file system – File models– File-Accessing models – File-Sharing semantics – **File-Caching schemes – File replication – Fault tolerance. (Self Study)**

UNIT –V LINUX (12 Hrs)

The Linux Shell and File Structure: The Shell – The Command Line – History – Filename Expansion – Standard Input/Output and Redirection – Pipes – Ending Processes – The shell scripts and Programming –Shell Variables – Shell Scripts – Environment Variables and Subshells – Control Structures – **TCSH/C Shell Control structures.(Self Study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 Hrs.)

Analysis of different types of Operating systems in real time applications.

REFERENCES:

1. ***Distributed Operating Systems Concepts and Design,*** Pradeep K. Sinha, Prentice Hall of India Private Limited, 2012.
2. Linux: The Complete Reference, Richard Petersen, McGraw Hill Education (India) Private Limited, 6th Edition, 2011.
6. ***Operating Systems,*** Stuart Madnick, John Donovan, McGraw Hill Education, 2012.
7. ***Distributed Operating Systems***, Andrew S. Tanenbaum, Pearson Education, New Delhi, 2013.
8. ***Beginning Linux Programming,*** Neil Matthew, Richard Stones, Wiley India Pvt. Ltd, 2014

OPEN EDUCATIONAL RESOURCES :

2. https://www.tutorialspoint.com/operating_system/index.htm

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Fundamentals – Distributed computing systems	1	Chalk & Talk	Black Board
1.2	Evolution of distributed computing systems	2	Chalk & Talk	LCD
1.3	Distributed computing system models – Popularity of distributed computing systems	4	Lecture	PPT & White board
1.4	Distributed operating system – Issues in designing a distributed operating system(Self Study)	1	Discussion	Google Classroom
1.5	Introduction to distributed computing environment(DCE)	2	Lecture	Black Board
UNIT -2 MESSAGE PASSING				
2.1	Introduction – Desirable features of a good message-passing system	1	Lecture	Green Board Charts
2.2	Issues in IPC by message passing – Synchronization – Buffering	2	Chalk & Talk	Green Board
2.3	Multidatagram messages – Remote Procedure Calls	3	Chalk & Talk	Black Board
2.4	Implementing RPC mechanism	2	Chalk & Talk	Black Board
UNIT -3DISTRIBUTED SHARED MEMORY				
3.1	Introduction – General	3	Chalk &	Black

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	architecture of DSM systems		Talk	Board
3.2	Design and implementation issues of DSM	3	Lecture	Green Board Charts
3.3	Synchronization – Introduction – Clock synchronization – Election Algorithms.	3	Chalk & Talk	Black Board
3.4	Resource Management – Introduction – Desirable features of a good global scheduling algorithm – load sharing approach. (Self Study)	3	Discussion	Google Classroom
UNIT -4PROCESS MANAGEMENT				
4.1	Introduction – Process migration	2	Chalk & Talk	Black Board
4.2	Distributed File Systems – Introduction – Desirable features of a good distributed file system	3	Lecture	Green Board
4.3	File models– File-Accessing models	3	Chalk & Talk	Black Board
4.4	File-Sharing semantics	2	Lecture	Green Board
4.5	File-Caching schemes – File replication – Fault tolerance. (Self Study)		Discussion	Google Classroom
UNIT -5LINUX				
5.1	The Shell – The Command Line – History – Filename Expansion	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.2	Standard Input/Output and Redirection – Pipes – Ending Processes	3	Lecture	Green Board
5.3	The shell scripts and Programming –Shell Variables	3	Chalk & Talk	Black Board
5.4	Shell Scripts – Environment Variables and Sub shells - Control Structures	2	Chalk & Talk	Black Board
5.5	TCSH/C Shell Control structures.(Self Study)	1	Discussion	Google Classroom
UNIT -6DYNAMISM				
6.1	Analysis of different types of Operating systems in real time applications.	3	Assignment submission	Google Classroom

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average	Better of W1, W2	M1+M2	MID-SEM TEST				
	5 Mks.	5+5=10 Mks.	15 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	

K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the core concepts of distributed systems.	K2	PSO1, PSO2
CO 2	Analyze various message passing mechanisms with its model.	K2, K4	PSO4,PSO6
CO 3	Identify the inherent difficulties that arise due to distribution of computing resources.	K3& K4	PSO3,PSO6
CO 4	Explain migration with the process management policies.	K2, K3	PSO2,PSO5
CO 5	Explain the basic concepts, design and structure of the LINUX operating system.	K2 & K4	PSO4,PSO6

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

2. Mrs. T. Leena Prema Kumari

Forwarded By

HOD'S Signature

& Name

I M.Sc.,

SEMESTER –II

For those who joined in 2021 onwards

OLD SYLLABUS

Deletion 5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT7	CYBER SECURITY	Lecture	4	4

COURSE DESCRIPTION

Cyber Security courses aims to equip students with the knowledge and skills required to defend the computer operating systems, networks and data from cyber-attacks.

COURSE OBJECTIVES

The learner will gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.

UNIT I : INTRODUCTION TO CYBER CRIME [12 Hrs] 5%

Introduction to Cyber Crime: Role of ECD & ICTs in Cybercrime- Types of Cybercrime- Classification of Cybercriminals - Execution of Cybercrime - Tools and Factors influencing Cybercrime - Challenges and Strategies to prevent Cybercrime - Classification of Cybercrime: Cybercrime against Individual -Property and Nation.

UNIT II : CYBERCRIME: MOBILE AND WIRELESS DEVICES [12 Hrs]

Proliferation of Mobile and Wireless Devices - Trends in Mobility- Credit Card Frauds in Mobile and Wireless Computing- Security Challenges by Mobile Devices- Authentication Service Security- Attacks on Mobile/ Cell Phones-Organizational Measures of Handling Mobile.

UNIT III : TOOLS AND METHODS USED IN CYBERCRIME [12 Hrs]

Proxy Servers and Anonymizers-Phishing- Password Cracking- Keyloggers and Spywares- Virus and Worms-Trojan Horses and Backdoors-Steganography- DoS and DDoS attacks- SQL injection- Buffer Overflow-Attacks on Wireless Networks.

UNIT IV : Cybercrimes and Cybersecurity: The Legal Perspectives and Organizational Implications [12 Hrs]

Cybercrime and the Legal Landscape around the World-Objectives of Cyber security- Cost of Cybercrimes and IPR Issues- Web threats for Organizations- Security and Privacy implications- Social Media Marketing-Social Computing and the Associated Challenges for Organizations-Incident Handling- Forensics Best Practices for Organizations

UNIT V : CYBER LAW [12 Hrs]

Introduction to Cyber Laws: Need for Cyber Laws- Cyber Laws and Cyber Security-Strategies involved in Cyber security- Minimizing Risk with Cyber Laws- Terms and Terminologies Associated with Cyber Laws- Cyber Laws in India and International Cyber Laws and case studies.

TEXT BOOK

1. "Cyber Forensics" by Dejey Murugan, Oxford University Press, ISBN-13:978-0-19-948944-2, ISBN-10: 0-19-948944-0.

2. "Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives" by Nina Godbole, Sunit BelaPure, Wiley India, ISBN: 978-81-265-2179-1

REFERENCE BOOK :

"Cyber Security and Cyber Laws" by Alfred Basta,Nadine Basta,Mary Brown, Ravinder Kumar, Cengage Learning India Private Limited Publisher (2018)

Open Educational Resources:

3. https://searchsecurity.techtarget.com/definition/cybersecurity
4. https://www.tutorialspoint.com/computer_security/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION TO CYBER SECURITY**			
1.1	Introduction to Cyber Crime: Role of ECD & ICTs in Cybercrime	3	Chalk & Talk	Black Board
1.2	Types of Cybercrime-Classification of Cybercriminals	4	Chalk & Talk	LCD
1.3	Execution of Cybercrime - Tools and Factors influencing Cybercrime	4	Lecture	Smart Board
1.4	Challenges and Strategies to prevent Cybercrime	1	Lecture	Smart Board
UNIT -2	**CYBERCRIME: MOBILE AND WIRELESS DEVICES**			
2.1	Proliferation of Mobile and	4	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Wireless Devices - Trends in Mobility			
2.2	Credit Card Frauds in Mobile and Wireless Computing- Security Challenges by Mobile Devices	4	Lecture	Smart Board
2.3	Authentication Service Security- Attacks on Mobile/ Cell Phones-Organizational Measures of Handling Mobile.	4	Discussion	Google classroom
UNIT -3 TOOLS AND METHODS USED IN CYBERCRIME				
3.1	Proxy Servers and Anonymizers-Phishing- Password Cracking- Keyloggers and Spywares	4	Lecture	Green Board Charts
3.2	Virus and Worms-Trojan Horses and Backdoors- Steganography- DoS and DDoS attacks	4	Chalk & Talk	Green Board
3.3	SQL injection- Buffer Overflow-Attacks on Wireless Networks.	4	Chalk & Talk	Black Board
UNIT -4 CYBERCRIMES AND CYBERSECURITY: THE LEGAL PERSPECTIVES AND ORGANIZATIONAL IMPLICATIONS				
4.1	Cybercrime and the Legal Landscape around the World-Objectives of Cyber	3	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	security			
4.2	Cost of Cybercrimes and IPR Issues- Web threats for Organizations	4	Chalk & Talk	Black Board
4.3	Security and Privacy implications- Social Media Marketing- Social Computing and the Associated Challenges for Organizations	3	Lecture	Smart Board
4.4	Incident Handling- Forensics Best Practices for Organizations	2	Discussion	Google classroom
UNIT -5CYBER LAW &CYBER FORENSICS				
5.1	Introduction to Cyber Laws: Need for Cyber Laws- Cyber Laws and Cyber Security	3	Chalk & Talk	Black Board
5.2	Strategies involved in Cyber security- Minimizing Risk with Cyber Laws.	3	Lecture	Smart Board
5.3	Terms and Terminologies Associated with Cyber Laws	3	Chalk & Talk	Black Board
5.4	Cyber Laws in India and International Cyber Laws and case studies	3	Discussion	Google classroom
UNIT -6DYNAMISM				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
6.1	Tracing memory in real-time.	4	Discussion	Black board

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35

Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**C4**	**C5**	**CIA**	**ESE**	**Total**
5	**10**	**15**	**5**	**5**	**40**	**60**	**100**

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non – Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyze and evaluate the cyber security needs of an organization.	K2	PSO1, PSO4

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 2	Measure the performance and troubleshoot cyber security systems..	K2, K3	PSO2, PSO5
CO 3	Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators	K3, K4	PSO5, PSO6
CO 4	Design and develop a security architecture for an organization.	K3, K4	PSO3, PSO6
CO 5	Design operational and strategic cyber security strategies and policies.	K4, K5	PSO6, PSO8

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Staff Name : Dr. N. Kalaichelvi

Forwarded By

HOD'S Signature

& Name

FATIMA COLLEGE

(Autonomous)

Affiliated to Madurai Kamaraj University

Re-Accredited with 'A++' by NAAC (Cycle - IV)

Mary Land, Madurai - 625018, Tamil Nadu

I M.Sc.,

SEMESTER –II

NEW SYLLABUS

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT7	CYBER SECURITY	Lecture	4	4

COURSE DESCRIPTION

Cyber Security courses aims to equip students with the knowledge and skills required to defend the computer operating systems, networks and data from cyber-attacks.

COURSE OBJECTIVES

The learner will gain knowledge about securing both clean and corrupted systems, protect personal data, and secure computer networks.

UNIT I : INTRODUCTION TO CYBER CRIME [12 Hrs]

Introduction to Cyber Crime: Role of ECD & ICTs in Cybercrime- Types of Cybercrime- Classification of Cybercriminals - Execution of Cybercrime - Tools and Factors influencing Cybercrime - Challenges and Strategies to prevent Cybercrime

UNIT II : CYBERCRIME: MOBILE AND WIRELESS DEVICES [12 Hrs]

Proliferation of Mobile and Wireless Devices - Trends in Mobility- Credit Card Frauds in Mobile and Wireless Computing- Security Challenges by Mobile Devices- Authentication Service Security- Attacks on Mobile/ Cell Phones-Organizational Measures of Handling Mobile.

UNIT III : TOOLS AND METHODS USED IN CYBERCRIME [12 Hrs]

Proxy Servers and Anonymizers-Phishing- Password Cracking- Keyloggers and Spywares- Virus and Worms-Trojan Horses and Backdoors-Steganography- DoS and DDoS attacks- SQL injection- Buffer Overflow-Attacks on Wireless Networks.

UNIT IV : Cybercrimes and Cybersecurity: The Legal Perspectives and Organizational Implications [12 Hrs]

Cybercrime and the Legal Landscape around the World-Objectives of Cyber security- Cost of Cybercrimes and IPR Issues- Web threats for Organizations- Security and Privacy implications- Social Media Marketing-Social Computing and the Associated Challenges for Organizations-Incident Handling- Forensics Best Practices for Organizations

UNIT V : CYBER LAW [12 Hrs]

Introduction to Cyber Laws: Need for Cyber Laws- Cyber Laws and Cyber Security-Strategies involved in Cyber security- Minimizing Risk with Cyber Laws- Terms and Terminologies Associated with Cyber Laws- Cyber Laws in India and International Cyber Laws and case studies.

TEXT BOOK

3. "Cyber Forensics" by Dejey Murugan, Oxford University Press, ISBN-13:978-0-19-948944-2, ISBN-10: 0-19-948944-0.

4. "Cyber Security: Understanding Cyber crimes, Computer Forensics and Legal Perspectives" by Nina Godbole, Sunit BelaPure, Wiley India, ISBN: 978-81-265-2179-1

REFERENCE BOOK :

"Cyber Security and Cyber Laws" by Alfred Basta,Nadine Basta,Mary Brown, Ravinder Kumar, Cengage Learning India Private Limited Publisher (2018)

Open Educational Resources:

5. https://searchsecurity.techtarget.com/definition/cybersecurity
6. https://www.tutorialspoint.com/computer_security/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION TO CYBER SECURITY				
1.1	Introduction to Cyber Crime: Role of ECD & ICTs in Cybercrime	3	Chalk & Talk	Black Board
1.2	Types of Cybercrime-Classification of Cybercriminals	3	Chalk & Talk	LCD
1.3	Execution of Cybercrime - Tools and Factors influencing Cybercrime	3	Lecture	Smart Board
1.4	Challenges and Strategies to prevent Cybercrime	3	Lecture	Smart Board
UNIT -2 CYBERCRIME: MOBILE AND WIRELESS DEVICES				
2.1	Proliferation of Mobile and Wireless Devices - Trends in Mobility	4	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.2	Credit Card Frauds in Mobile and Wireless Computing- Security Challenges by Mobile Devices	4	Lecture	Smart Board
2.3	Authentication Service Security- Attacks on Mobile/ Cell Phones-Organizational Measures of Handling Mobile.	4	Discussion	Google classroom
UNIT -3 TOOLS AND METHODS USED IN CYBERCRIME				
3.1	Proxy Servers and Anonymizers-Phishing- Password Cracking- Keyloggers and Spywares	4	Lecture	Green Board Charts
3.2	Virus and Worms-Trojan Horses and Backdoors- Steganography- DoS and DDoS attacks	4	Chalk & Talk	Green Board
3.3	SQL injection- Buffer Overflow-Attacks on Wireless Networks.	4	Chalk & Talk	Black Board
UNIT -4 CYBERCRIMES AND CYBERSECURITY: THE LEGAL PERSPECTIVES AND ORGANIZATIONAL IMPLICATIONS				
4.1	Cybercrime and the Legal Landscape around the World-Objectives of Cyber security	3	Chalk & Talk	LCD
4.2	Cost of Cybercrimes and IPR Issues- Web threats for	4	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Organizations			
4.3	Security and Privacy implications- Social Media Marketing- Social Computing and the Associated Challenges for Organizations	3	Lecture	Smart Board
4.4	Incident Handling- Forensics Best Practices for Organizations	2	Discussion	Google classroom
UNIT -5CYBER LAW &CYBER FORENSICS				
5.1	Introduction to Cyber Laws: Need for Cyber Laws- Cyber Laws and Cyber Security	3	Chalk & Talk	Black Board
5.2	Strategies involved in Cyber security- Minimizing Risk with Cyber Laws.	3	Lecture	Smart Board
5.3	Terms and Terminologies Associated with Cyber Laws	3	Chalk & Talk	Black Board
5.4	Cyber Laws in India and International Cyber Laws and case studies	3	Discussion	Google classroom
UNIT -6DYNAMISM				
6.1	Tracing memory in real-time.	4	Discussion	Black board

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non – Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Analyze and evaluate the cyber security needs of an organization.	K2	PSO1, PSO4
CO 2	Measure the performance and troubleshoot cyber security systems..	K2, K3	PSO2, PSO5
CO 3	Comprehend and execute risk	K3, K4	PSO5, PSO6

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
	management processes, risk treatment methods, and key risk and performance indicators		
CO 4	Design and develop a security architecture for an organization.	K3, K4	PSO3, PSO6
CO 5	Design operational and strategic cyber security strategies and policies.	K4, K5	PSO6, PSO8

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Staff Name : Dr. N. Kalaichelvi

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

OLD SYLLABUS

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT8	DIGITAL IMAGE PROCESSING	PG Core	5 Hrs.	5

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

UNITS

UNIT I : INTRODUCTION (14 Hrs)

Introduction- What is Digital Image Processing- The Origins of Digital Image Processing – Examples of Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – **Components of an Image Processing System(Self Study).**

UNIT II : DIGITAL IMAGE FUNDAMENTALS (14 Hrs)

Elements of Visual Perception – Light and the Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – image interpolation - Some Basic Relationships between Pixels – **An Introduction to the Mathematical Tools Used in Digital Image Processing. (Self Study)**

UNIT III: INTENSITY TRANSFORMATIONS AND SPATIAL FILTERING (14 Hrs)

Background-Some Basic Intensity Transformation Functions - Histogram Processing – Fundamentals of Spatial Filtering – Smoothing Spatial Filters – Sharpening Spatial Filters – **Combining Spatial Enhancement Methods**. **(Self Study)**

UNIT IV: IMAGE RESTORATION AND RECONSTRUCTION (14 Hrs)

A Model of the Image Degradation/Restoration Process-Noise Models - Restoration in the Presence of Noise Only-Spatial Filtering. **Color Image Processing:** Color Fundamentals – **Color Models(Self Study)**

UNIT V: IMAGE COMPRESSION AND SEGMENTATION (14 Hrs)

Fundamentals – Huffman coding – Golomb coding- Arithmetic coding – LZW coding- Runlength coding - **Segmentation Fundamentals - Point, Line and Edge Detection(Self Study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs)

Image processing tools in current real time problems

REFERENCES:

1. ***Digital Image Processing***, Rafael.C.Gonzalez and Richard E.Woods, 3rd Edition, Pearson Publications, 2014.
   Chapters: 1, 2, 3.1 – 3.7, 5.1 – 5.3, 6.1, 6.2, 8.1 - 8.2.5, 10.1, 10.2
2. ***Fundamentals of Digital image processing***, Anil Jain, PHI Learning Pvt Ltd. 2011.
3. ***Digital Image Processing & Analysis***, B.Chanda, D.Dutta Majumder, 2nd Edition, PHI Learning Pvt Ltd. 2013.
4. ***Digital Image Processing***, Chaturvedi, 1st Edition, Vayu Educaton India Publisher, 2013.
5. ***Digital Image Processing: Principles and Applications***, Wilhelm **Burger and Mark J. Burge,** 2nd Edition, Springer, 2016.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Introduction- What is Digital Image Processing- The Origins of Digital Image Processing	4	Chalk & Talk	Black Board
1.2	Examples of Fields that Use Digital Image Processing	4	Chalk & Talk	LCD
1.3	Fundamental Steps in Digital Image Processing	3	Lecture	PPT & White board
1.4	Components of an Image Processing System(Self Study)	3	Discussion	Black Board
UNIT -2 DIGITAL IMAGE FUNDAMENTALS				
2.1	Elements of Visual Perception – Light and the Electromagnetic Spectrum	4	Lecture	Black Board
2.2	Image Sensing and Acquisition – Image Sampling and Quantization	4	Lecture	PPT & White board
2.3	image interpolation - Some Basic Relationships between Pixels	4	Lecture	Black Board
2.4	An Introduction to the Mathematical Tools Used in Digital Image Processing(Self Study)	2	Discussion	Black Board
UNIT -3 INTENSITY TRANSFORMATIONS AND SPATIAL FILTERING				
3.1	Background-Some Basic Intensity Transformation Functions	4	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
				Charts
3.2	Histogram Processing – Fundamentals of Spatial Filtering	4	Chalk & Talk	Green Board
3.3	Smoothing Spatial Filters Sharpening Spatial Filters	4	Chalk & Talk	Green Board
3.4	Combining Spatial Enhancement Methods(Self Study)	2	Discussion	Black Board
UNIT -4	**IMAGE RESTORATION AND RECONSTRUCTION**			
4.1	A Model of the Image Degradation/Restoration Process	2	Chalk & Talk	Green Board
4.2	Noise Models - Restoration in the Presence of Noise Only	3	Chalk & Talk	Black Board
4.3	Spatial Filtering.	5	Chalk & Talk	Black Board
4.4	Color Fundamentals	2	Chalk & Talk	Black Board
4.5	Color Models(Self Study)	2	Discussion	Black Board
UNIT -5	**IMAGE COMPRESSION AND SEGMENTATION**			
5.1	Fundamentals – Huffman coding – Golomb coding	4	Chalk & Talk	Black Board
5.2	Arithmetic coding – LZW coding-	4	Chalk & Talk	Green Board
5.3	Run length coding	4	Chalk & Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.4	Segmentation Fundamentals - Point, Line and Edge Detection(Self Study)	2	Discussion	Black Board
UNIT -6 DYNAMISM				
6.1	Image processing tools in current real time problems	5	Group Discussion	Black Board

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the representation of digital image and its manipulations	K2	PSO1,PSO2
CO 2	Analyze image sampling and quantization requirements and implications	K2, K3	PSO4,PSO5
CO 3	Describe various Transformation and Filtering Techniques	K2, K3	PSO4,PSO5
CO 4	Demonstrate Restoration And Reconstruction models	K3, K4	PSO5,PSO6
CO 5	Utilize Image Compression And Segmentation for efficient storage	K3, K5	PSO5,PSO8

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1

CO5	**3**	**2**	**1**	**1**

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Staff Name : T. Leena Prema Kumari

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

NEW SYLLABUS

Insertion 5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT8	DIGITAL IMAGE PROCESSING	Lecture	5	5

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

UNITS

UNIT I : INTRODUCTION (14 Hrs)

Introduction- What is Digital Image Processing- The Origins of Digital Image Processing – Examples of Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – **Components of an Image Processing System(Self Study).**

UNIT II : DIGITAL IMAGE FUNDAMENTALS (14 Hrs)

Elements of Visual Perception – Light and the Electromagnetic Spectrum – Image Sensing and Acquisition – Image Sampling and Quantization – image

interpolation - Some Basic Relationships between Pixels – **An Introduction to the Mathematical Tools Used in Digital Image Processing. (Self Study)**

UNIT III: INTENSITY TRANSFORMATIONS AND SPATIAL FILTERING (14 Hrs)

Background-Some Basic Intensity Transformation Functions - Histogram Processing – Fundamentals of Spatial Filtering – Smoothing Spatial Filters – Sharpening Spatial Filters – **Combining Spatial Enhancement Methods. (Self Study)**

UNIT IV: IMAGE RESTORATION AND RECONSTRUCTION (14 Hrs)

A Model of the Image Degradation/Restoration Process-Noise Models - Restoration in the Presence of Noise Only-Spatial Filtering. **Color Image Processing:** Color Fundamentals – **Color Models(Self Study)**

UNIT V: IMAGE COMPRESSION AND SEGMENTATION (14 Hrs) 5%

Fundamentals – Huffman coding – Golomb coding- Arithmetic coding – LZW coding- Run length coding - **Segmentation Fundamentals (Self Study)**- Point, Line and Edge Detection Thresholding-Region –Based Segmentation.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs)

Image processing tools in current real time problems

REFERENCES:

6. ***Digital Image Processing***, Rafael.C.Gonzalez and Richard E.Woods, 3rd Edition, Pearson Publications, 2014.
   Chapters: 1, 2, 3.1 – 3.7, 5.1 – 5.3, 6.1, 6.2, 8.1 - 8.2.5, 10.1, 10.2
7. ***Fundamentals of Digital image processing***, Anil Jain, PHI Learning Pvt Ltd. 2011.

8. ***Digital Image Processing & Analysis***, B.Chanda, D.Dutta Majumder, 2nd Edition, PHI Learning Pvt Ltd. 2013.
9. ***Digital Image Processing***, Chaturvedi, 1st Edition, Vayu Educaton India Publisher, 2013.
10. ***Digital Image Processing: Principles and Applications***, Wilhelm **Burger and Mark J. Burge,** 2nd Edition, Springer, 2016.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	Introduction- What is Digital Image Processing- The Origins of Digital Image Processing	4	Chalk & Talk	Black Board
1.2	Examples of Fields that Use Digital Image Processing	4	Chalk & Talk	LCD
1.3	Fundamental Steps in Digital Image Processing	3	Lecture	PPT & White board
1.4	Components of an Image Processing System(Self Study)	3	Discussion	Black Board
UNIT -2	**DIGITAL IMAGE FUNDAMENTALS**			
2.1	Elements of Visual Perception – Light and the Electromagnetic Spectrum	4	Lecture	Black Board
2.2	Image Sensing and Acquisition – Image Sampling and Quantization	4	Lecture	PPT & White board
2.3	image interpolation - Some Basic Relationships between Pixels	4	Lecture	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.4	An Introduction to the Mathematical Tools Used in Digital Image Processing(Self Study)	2	Discussion	Black Board
UNIT -3	**INTENSITY TRANSFORMATIONS AND SPATIAL FILTERING**			
3.1	Background-Some Basic Intensity Transformation Functions	4	Lecture	Green Board Charts
3.2	Histogram Processing – Fundamentals of Spatial Filtering	4	Chalk & Talk	Green Board
3.3	Smoothing Spatial Filters Sharpening Spatial Filters	4	Chalk & Talk	Green Board
3.4	Combining Spatial Enhancement Methods(Self Study)	2	Discussion	Black Board
UNIT -4	**IMAGE RESTORATION AND RECONSTRUCTION**			
4.1	A Model of the Image Degradation/Restoration Process	2	Chalk & Talk	Green Board
4.2	Noise Models - Restoration in the Presence of Noise Only	3	Chalk & Talk	Black Board
4.3	Spatial Filtering.	5	Chalk & Talk	Black Board
4.4	Color Fundamentals	2	Chalk & Talk	Black Board
4.5	Color Models(Self Study)	2	Discussion	Black Board
UNIT -5	**IMAGE COMPRESSION AND SEGMENTATION**			

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.1	Fundamentals – Huffman coding – Golomb coding	4	Chalk & Talk	Black Board
5.2	Arithmetic coding – LZW coding-	4	Chalk & Talk	Green Board
5.3	Run length coding	4	Chalk & Talk	Green Board
5.4	Segmentation Fundamentals - Point, Line and Edge Detection(Self Study) – Region based segmentation	2	Discussion	Black Board
UNIT -6 DYNAMISM				
6.1	Image processing tools in current real time problems	5	Group Discussion	Black Board

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %

K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the representation of digital image and its manipulations	K2	PSO1,PSO2
CO 2	Analyze image sampling and quantization requirements and implications	K2, K3	PSO4,PSO5
CO 3	Describe various Transformation and Filtering Techniques	K2, K3	PSO4,PSO5
CO 4	Demonstrate Restoration And Reconstruction models	K3, K4	PSO5,PSO6
CO 5	Utilize Image Compression And Segmentation for efficient storage	K3, K5	PSO5,PSO8

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Staff name : Mrs. T. Leena Prema Kumari

Forwarded By

HOD'S Signature

& Name

I M.Sc. IT

SEMESTER –II

OLD SYLLABUS

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT10	LAB IN IMAGE PROCESSING	Practical	5	3

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

Programs :

1. Converting an image into Grey Image
2. Filter RGB colours using three Buttons
3. Filter RGB colour using Single Button
4. Negative Image and Grey Image
5. Colour Negative
6. Display Grey Image and Increase the intensity Value using ij, jar file
7. Image Rotation
8. Zoom in and Zoom out
9. Union and Intersection
10. Addition and Subtraction
11. Bilinear Interpolation
12. Log and Gamma Intensity Transformation'
13. Piecewise Linear Transformation Intensity Level Slicing
14. Bit plane Slicing
15. Image Contrast Stretching

16. Histogram
17. Quantization
18. Histogram Matching
19. Image Border
20. Image Smoothening.
21. Image Sharpening.
22. Noise Filtering
23. Line Detection
24. Edge Detection
25. Point Detection

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
PROGRAM LIST				
1	Converting an image into Grey Image Filter RGB colours using three Buttons Filter RGB colour using Single Button Negative Image and Grey Image Colour Negative	10	Demonstration	Desktop
2	Display Grey Image and Increase the intensity Value using ij, jar file Image Rotation Zoom in and Zoom OUT	10	Demonstration	Desktop
3	Union and Intersection Addition and Subtraction Bilinear Interpolation Log and Gamma Intensity Transformation'	10	Demonstration	Desktop

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4	Piecewise Linear Transformation Intensity Level Slicing Bit plane Slicing Image Contrast Stretching Histogram	10	Demonstration	Desktop
5	Quantization Histogram Matching Image Border	10	Demonstration	Desktop
6	Image Smoothening. Image Sharpening	5	Demonstration	Desktop
7	Noise Filtering	5	Demonstration	Desktop
8	Line Detection	5	Demonstration	Desktop
9	Edge Detection	5	Demonstration	Desktop
10	Point Detection	5	Demonstration	Desktop

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC	NON - SCHOLASTIC	MARKS

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
20	15	5	40	60	100

- **PG CIA Components**

C1– Average of Two Model test Marks

C 2- Program Completion and Record Work

C 3 – Non – Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	DemonstrateFundamental Steps involved in Digital Image Processing	K1	PSO1& PSO2
CO 2	Analyze and useMathematical Tools for Digital Image Processing	K1, K2,	PSO3
CO 3	Apply Intensity Transformation functions and Spatial filtering methods	K1 & K3	PSO5
CO 4	UtiliseColor Image Processing with different Color Models	K1, K2, K3 &	PSO8, PSO9
CO 5	Implement Image Segmentation Techniquesand Image Compression Techniques using Huffman , Golomb and Arithmetic coding algorithms	K2 & K4	PSO6,PSO8

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. T.Leena Prema Kumari

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& Name

I M.Sc. IT

SEMESTER –II

For those who joined in 2021 onwards

NEW SYLLABUS

Insertion

5%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG2IT10	LAB IN IMAGE PROCESSING	Practical	5	3

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

Programs :

1. Converting an image into Grey Image
2. Filter RGB colours using three Buttons
3. Filter RGB colour using Single Button
4. Negative Image and Grey Image
5. Colour Negative
6. Display Grey Image and Increase the intensity Value using ij, jar file
7. Image Rotation
8. Zoom in and Zoom out
9. Union and Intersection
10. Addition and Subtraction
11. Bilinear Interpolation
12. Log and Gamma Intensity Transformation'
13. Piecewise Linear Transformation Intensity Level Slicing
14. Bit plane Slicing
15. Image Contrast Stretching

16. Histogram
17. Quantization
18. Histogram Matching
19. Image Border
20. Image Smoothening.
21. Image Sharpening.
22. Noise Filtering
23. Line Detection
24. Edge Detection
25. Point Detection
26. Region- based segmentation

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
PROGRAM LIST				
1	Converting an image into Grey Image Filter RGB colours using three Buttons Filter RGB colour using Single Button Negative Image and Grey Image Colour Negative	10	Demonstration	Desktop
2	Display Grey Image and Increase the intensity Value using ij, jar file Image Rotation Zoom in and Zoom OUT	10	Demonstration	Desktop
3	Union and Intersection Addition and Subtraction Bilinear Interpolation	10	Demonstration	Desktop

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Log and Gamma Intensity Transformation'			
4	Piecewise Linear Transformation Intensity Level Slicing Bit plane Slicing Image Contrast Stretching Histogram	10	Demonstration	Desktop
5	Quantization Histogram Matching Image Border	10	Demonstration	Desktop
6	Image Smoothening. Image Sharpening	5	Demonstration	Desktop
7	Noise Filtering	5	Demonstration	Desktop
8	Line Detection	5	Demonstration	Desktop
9	Edge Detection	5	Demonstration	Desktop
10	Point Detection, Region based segmentation	5	Demonstration	Desktop

CIA	
Scholastic	**35**
Non Scholastic	**5**
	40

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
20	15	5	40	60	100

- **PG CIA Components**

C1– Average of Two Model test Marks

C 2- Program Completion and Record Work

C 3 – Non – Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	DemonstrateFundamental Steps involved in Digital Image Processing	K1	PSO1& PSO2
CO 2	Analyze and useMathematical Tools for Digital Image Processing	K1, K2,	PSO3
CO 3	Apply Intensity Transformation functions and Spatial filtering methods	K1 & K3	PSO5
CO 4	UtiliseColor Image Processing with different Color Models	K1, K2, K3 &	PSO8, PSO9
CO 5	Implement Image Segmentation Techniquesand Image	K2 & K4	PSO6,PSO8

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
	Compression Techniques using Huffman , Golomb and Arithmetic coding algorithms		

Mapping of C0s with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of C0s with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

2. T.Leena Prema Kumari

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HOD'S Signature

& Name

II M.Sc.,

SEMESTER –III

OLD SYLLABUS

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT12	DATA MINING AND DATA WAREHOUSING	Lecture	5	5

COURSE DESCRIPTION

This course introduces the basic concepts, principles, methods, implementation techniques, and applications of data mining.

COURSE OBJECTIVES

To facilitate the student to understand the concepts of data mining and to understand various techniques involved in data mining.

UNITS

UNIT I: INTRODUCTION (14Hrs)

Data mining concepts – Database & Data Warehouse - Data Mining functionalities - Technologies used - Data Mining Applications - Integration of Data Mining System with a Database or Data Warehouse System **– Major Issues in Data Mining (Self study).**

UNIT II: DATA PREPROCESSING & DATA WAREHOUSING (14Hrs)

Need to Preprocess the Data - Descriptive Data Summarization – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation. Data Warehouse and OLAP Technology : An Overview - What is a Data Warehouse – A Multidimensional Data Model – Data Warehouse Architecture – **Data**

Warehouse Implementation – From Data Warehousing to a Data Mining (Self study).

UNIT III: MINING FREQUENT PATTERNS AND CLASSIFICATION (14 Hrs)

Mining Frequent Patterns - Association Rule Mining – The Apriori Algorithm – FP Growth - Correlation Analysis.Mining Frequent Itemsets Using Vertical Data Format – **Mining Closed Frequent Itemsets (Self study)..**Classification – Decision Tree induction - Constructing decision tree – ID3 algorithm – Pruning – Bayesian Classification – Rule Based Classification - Classification by Back propagation – Support Vector Machines.

UNIT IV: CLUSTERING AND OUTLIERS (14Hrs)

Cluster Analysis – Clustering Methods – Partitioning Methods - Hierarchical Methods – Density Based Methods – Grid-Based Methods – Model-Based Clustering Methods. Outlier and **Outlier Analysis (Self Study) -** Outlier Detection Methods

UNIT V: APPLICATIONS AND TRENDS IN DATA MINING (14Hrs)

Other Methodologies of Data Mining - Data Mining Applications – **Data mining Trends (Self Study).**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs)

Current trends in implementation of Data Mining tools in real time applications.

REFERENCES:

1. ***Data Mining Concepts and Techniques***, Jiawei Han and MichelineKamber, 2nd Edition, Morgan Kaufmann Publishers An Imprint of Elsevier, 2009. Chapters:1, 2, 3, 6.1 - 6.10, 7.1 – 7.8, 11
2. ***Data Mining Techniques and Applications: An Introduction,***Hongbo DLL, CengageLmg Business Press, 2010.
3. ***Data Warehousing: Concepts, Techniques, Products and Applications***, 3rd Edition, PHI Learning, Delhi, 2012.

4. ***Data Mining & Data Warehousing***, UditAgarwal, 1st Edition, S.K.Kataria& sons Publication, 2016.
5. ***Data Mining: Concepts and Techniques***, Jiawei Han, MichelineKamber, 3rd Edition Morgan Kauffmann Publishers, 2011.

Digital Open Educational Resources (DOER) :

1. https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing
2. https://www.dei.unipd.it/~capri/SI/MATERIALE/DWDM0405.pdf

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Data mining concepts – Database & Data Warehouse - Data Mining functionalities - Technologies used - Data Mining Applications -	5	Chalk & Talk	Black Board
1.2	Integration of Data Mining System with a Database or Data Warehouse System **–**	6	Chalk & Talk	LCD
1.3	**Major Issues in Data Mining (Self study).**	3	Discussion	Google Classroom
UNIT -2 DATA PREPROCESSING& DATA WAREHOUSING				
2.1	Need to Preprocess the Data - Descriptive Data Summarization – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.	6	Lecture	Green Board
2.2	Data Warehouse and OLAP Technology : An Overview - What is a Data Warehouse – A Multidimensional Data Model - Data Warehouse Architecture	5	Chalk &Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.3	**Data Warehouse Implementation – From Data Warehousing to a Data Mining (Self study).**Data Warehouse implementation - From Data Warehousing to a Data Mining	3	Discussion	Google Classroom
UNIT -3MINING FREQUENT PATTERNS AND CLASSIFICATION				
3.1	Efficient and Scalable Frequent Itemset Mining Methods: The Apriori Algorithm : Finding Frequent Itemsets Using Candidate Generation- Generating Association Rules from Frequent Itemsets	4	Chalk & Talk	Black Board
3.2	Improving the Efficiency of Apriori – Mining Frequent Itemsets without Candidate Generation- Mining Frequent Itemsets Using Vertical Data Format – Mining Closed Frequent Itemsets.	5	Chalk & Talk	LCD
3.3	Classification - Prediction – Issues Regarding Classification and Prediction	3	Chalk & Talk	Black Board
3.4	Classification by Decision Tree Induction – Bayesian Classification – Rule-Based Classification	3	Lecture	Green Board
3.5	Classification by Back propagation – Support Vector Machines.	3	Lecture	Green Board
UNIT -4 CLUSTERING & OUTLIERS				
4.1	Cluster Analysis – Clustering Methods.	3	Chalk & Talk	Black Board
4.2	Partitioning Methods - Hierarchical Methods – Density	6	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Based Methods			
4.3	Grid-Based Methods – Model-Based Clustering Methods.	3	Chalk & Talk	LCD
4.4	Outlier and **Outlier Analysis (Self Study)** - Outlier Detection Methods	2	Chalk & Talk	Black Board
UNIT -5 APPLICATIONS AND TRENDS IN DATA MINING				
5.1	Other Methodologies of Data Mining	6	Chalk & Talk	Black Board
5.2	Data Mining Applications – **Data mining Trends (Self Study).**	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Current trends in implementation of Data Mining tools in real time applications.	5	Assignments	Google class room

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %

Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

Nos					
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the fundamental concept of Data Mining and analyze and evaluate the data cleaning, integration , transformation and reduction techniques	K2,K3	PSO1,PSO2
CO 2	Design multidimensional data using Data Warehouse architecture.	K2, K3	PSO1, PSO2, PSO3 & PSO5
CO 3	Analyze and evaluate Classification algorithms	K3, K4	PSO3,PSO4,PSO6& PSO7
CO 4	Identify the types of data in Cluster Analysis and categorize the Cluster Methods	K3 ,K4	PSO1, PSO2, PSO7 & PSO8
CO 5	Utilize the Data Mining techniques in various real	K4 ,K5	PSO1, PSO2, PSO3& PSO9

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
	applications and in major issues.		

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	2	1	1	2	1	1
CO2	3	3	3	2	3	2	1	1	2
CO3	2	2	3	3	1	3	3	2	1
CO4	3	3	2	1	2	1	3	3	2
CO5	3	3	3	2	2	1	2	2	3

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	2	1
CO2	2	1	3	2
CO3	3	1	2	1
CO4	2	2	3	2
CO5	2	2	2	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Dr. V. Jane Varamani sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

II M.Sc.,

SEMESTER –III

For those who joined in 2021 onwards

NEW SYLLABUS

Insertion **5%**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT12	DATA MINING AND DATA WAREHOUSING	Lecture	5	5

COURSE DESCRIPTION

This course introduces the basic concepts, principles, methods, implementation techniques, and applications of data mining.

COURSE OBJECTIVES

To facilitate the student to understand the concepts of data mining and to understand various techniques involved in data mining.

UNITS

UNIT I: INTRODUCTION (14Hrs)

Data mining concepts – Database & Data Warehouse - Data Mining functionalities - Technologies used - Data Mining Applications - Integration of Data Mining System with a Database or Data Warehouse System **– Major Issues in Data Mining (Self study).**

UNIT II: DATA PREPROCESSING & DATA WAREHOUSING (14Hrs)

Need to Preprocess the Data - Descriptive Data Summarization – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation. Data Warehouse and OLAP Technology : An Overview - What is a Data Warehouse – A Multidimensional Data Model – Data Warehouse Architecture – **Data**

Warehouse Implementation – From Data Warehousing to a Data Mining (Self study).

UNIT III: MINING FREQUENT PATTERNS AND CLASSIFICATION (14 Hrs)

Mining Frequent Patterns - Association Rule Mining – The Apriori Algorithm – FP Growth - Correlation Analysis.Mining Frequent Itemsets Using Vertical Data Format – **Mining Closed Frequent Itemsets (Self study)..**Classification – Decision Tree induction - Constructing decision tree – ID3 algorithm – Pruning – Bayesian Classification – Rule Based Classification - Classification by Back propagation – Support Vector Machines.

UNIT IV: CLUSTERING AND OUTLIERS (14Hrs)

Cluster Analysis – Clustering Methods – Partitioning Methods - Hierarchical Methods – Density Based Methods – Grid-Based Methods – Model-Based Clustering Methods. Outlier and **Outlier Analysis (Self Study) -** Outlier Detection Methods

UNIT V: APPLICATIONS AND TRENDS IN DATA MINING (14Hrs) 5%

Mining Complex Data Types - Other Methodologies of Data Mining - Data Mining Applications – Data Mining and Society -**Data mining Trends (Self Study).**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 Hrs)

Current trends in implementation of Data Mining tools in real time applications.

REFERENCES:

6. ***Data Mining Concepts and Techniques***, Jiawei Han and MichelineKamber, 2nd Edition, Morgan Kaufmann Publishers An Imprint of Elsevier, 2009. Chapters:1, 2, 3, 6.1 - 6.10, 7.1 – 7.8, 11

7. ***Data Mining Techniques and Applications: An Introduction,***Hongbo DLL, CengageLmg Business Press, 2010.

8. ***Data Warehousing: Concepts, Techniques, Products and Applications***, 3rd Edition, PHI Learning, Delhi, 2012.
9. ***Data Mining & Data Warehousing***, UditAgarwal, 1st Edition, S.K.Kataria& sons Publication, 2016.
10. ***Data Mining: Concepts and Techniques***, Jiawei Han, MichelineKamber, 3rd Edition Morgan Kauffmann Publishers, 2011.

Digital Open Educational Resources (DOER) :

3. https://www.javatpoint.com/data-mining-cluster-vs-data-warehousing
4. https://www.dei.unipd.it/~capri/SI/MATERIALE/DWDM0405.pdf

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Data mining concepts – Database & Data Warehouse - Data Mining functionalities - Technologies used - Data Mining Applications -	5	Chalk & Talk	Black Board
1.2	Integration of Data Mining System with a Database or Data Warehouse System **–**	6	Chalk & Talk	LCD
1.3	**Major Issues in Data Mining (Self study).**	3	Discussion	Google Classroom
UNIT -2 DATA PREPROCESSING& DATA WAREHOUSING				
2.1	Need to Preprocess the Data - Descriptive Data Summarization – Data Cleaning – Data Integration and Transformation – Data Reduction – Data Discretization and Concept Hierarchy Generation.	6	Lecture	Green Board
2.2	Data Warehouse and OLAP Technology : An Overview - What is a Data Warehouse – A	5	Chalk &Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Multidimensional Data Model - Data Warehouse Architecture			
2.3	**Data Warehouse Implementation – From Data Warehousing to a Data Mining (Self study).**Data Warehouse implementation - From Data Warehousing to a Data Mining	3	Discussion	Google Classroom
UNIT -3MINING FREQUENT PATTERNS AND CLASSIFICATION				
3.1	Efficient and Scalable Frequent Itemset Mining Methods: The Apriori Algorithm : Finding Frequent Itemsets Using Candidate Generation- Generating Association Rules from Frequent Itemsets	4	Chalk & Talk	Black Board
3.2	Improving the Efficiency of Apriori – Mining Frequent Itemsets without Candidate Generation- Mining Frequent Itemsets Using Vertical Data Format – Mining Closed Frequent Itemsets.	5	Chalk & Talk	LCD
3.3	Classification - Prediction – Issues Regarding Classification and Prediction	3	Chalk & Talk	Black Board
3.4	Classification by Decision Tree Induction – Bayesian Classification – Rule-Based Classification	3	Lecture	Green Board
3.5	Classification by Back propagation – Support Vector Machines.	3	Lecture	Green Board
UNIT -4 CLUSTERING & OUTLIERS				
4.1	Cluster Analysis – Clustering Methods.	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.2	Partitioning Methods - Hierarchical Methods – Density Based Methods	6	Lecture	Green Board
4.3	Grid-Based Methods – Model-Based Clustering Methods.	3	Chalk & Talk	LCD
4.4	Outlier and **Outlier Analysis (Self Study) -** Outlier Detection Methods	2	Chalk & Talk	Black Board
UNIT -5 APPLICATIONS AND TRENDS IN DATA MINING				
5.1	Mining Complex Data Types - Other Methodologies of Data Mining	6	Chalk & Talk	Black Board
5.2	Data Mining Applications – Data Mining and Society -**Data mining Trends (Self Study).**	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Current trends in implementation of Data Mining tools in real time applications.	5	Assignments	Google class room

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %

K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the fundamental concept of Data Mining and analyze and evaluate the data cleaning, integration , transformation and reduction techniques	K2,K3	PSO1,PSO2
CO 2	Design multidimensional data using Data Warehouse architecture.	K2, K3	PSO1, PSO2, PSO3 & PSO5
CO 3	Analyze and evaluate Classification algorithms	K3, K4	PSO3,PSO4,PSO6& PSO7
CO 4	Identify the types of data in Cluster Analysis and categorize the Cluster	K3 ,K4	PSO1, PSO2, PSO7 & PSO8

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
	Methods		
CO 5	Utilize the Data Mining techniques in various real applications and in major issues.	K4 ,K5	PSO1, PSO2, PSO3& PSO9

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	3	1	2	1	1	2	1	1
CO2	3	3	3	2	3	2	1	1	2
CO3	2	2	3	3	1	3	3	2	1
CO4	3	3	2	1	2	1	3	3	2
CO5	3	3	3	2	2	1	2	2	3

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	2	1
CO2	2	1	3	2
CO3	3	1	2	1
CO4	2	2	3	2
CO5	2	2	2	2

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

2. **Dr. V. Jane Varamani sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

OLD SYLLABUS

Deletion 15%

II M.Sc.,

SEMESTER –III

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT13	ADVANCED PYTHON PROGRAMMING	PG Core	5 Hrs.	5

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

UNITS

15%

UNIT I: OVERVIEW **(12 Hrs)**

The Context Of Software Development: Software-Development Tools-Learning Programming With Python-Writing A Python Program-A Longer Python Program.

Values And Variables:Integer Values-Variables And Assignment-Identifiers-Floating Point Types-Control Code With In Strings-User Input-The Eval Function-Controlling The Print Function.

Expressions And Arithmetic: Expression-Operator Precedence And Associativity-Comments-Errors-Arithmetic Examples-More Arithmetic Operators-Algorithms (Self study)

UNIT II CONDITIONAL STATEMENT AND ITERATION **(15 Hrs)**

Conditional Execution :Boolean Expressions- Boolean Expressions – The Simple If Statement – The If/Else Statement – Compound Boolean Expressions –Nested Conditionals – Multi-Way Decision Statements – Conditional Expressions – Errors In Conditional Statements

Iteration :The While Statement – Definite Loops Vs. Indefinite Loops – The For Statement – Nested Loops – Abnormal Loop Termination – Infinite Loops – Iteration Examples

UNIT III :LISTS& FUNCTIONS (15 Hrs)

List: Using Lists – List Assignment and Equivalence – List Bounds – Slicing – Cloning- Nested Lists-List and functions – Prime Generation with a List - List Processing : Sorting – Flexible Sorting – Search – List Permutations – Randomly Permuting a List – Reversing a List-

Functions : Introduction to Functions – Defining – Calling function –Passing Arguments- Keyword Arguments- Default Arguments – Required Arguments – Variable length Arguments – Return Statement – Nesting of Passing Arguments – Anonymous Function- Recursive function – Scope of Local and Global Variables .

UNIT IV: OBJECT ORIENTED PROGRAMMING PRINCIPLES (15 Hrs)

Class Statement – Class Body- Objects- Class Methods – Self Variable – Class Properties and Instance Properties – Static Method – Data Hiding – Deleting an object – Constructor – Method Overriding – Inheritance – Composition Object – Abstract classes and interfaces – Metaclass- Operator overloading.–Garbage Collections.

UNIT V : TKINTER , EVENTS & EXCEPTIONS (15 Hrs)

Tkinter : Introduction – Widget – Label – Button – Check button – Entry – List box – Radio button – Scroll bar – Text- Container – Frame – Menu – Label frame – Message – Combo box – Scale – Canvas.

Events: Event Object – Binding Call backs to Events – Events Names – Keyboard Events – Mouse events.

Handling Exceptions : Motivation – Exception Examples – Handling Exception in Invoked Function - Using Exceptions- Custom Exceptions (Self Study)

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 HRS.)

Application development based on case study

REFERENCES:

1. Richard L.Halterman ,"LEARNING TO PROGRAM WITH PYTHON",ELITE PUBLISHING, 2011
2. Ch. Satyanarayana, M. Radhika mani, B.N. Jagadesh, " Python Programming", Universities press,2018.

WEB REFERENCES:

1. www.universitiespress.com/chsatyanarayana/pythonprogramming
2. https://www.udemy.com/course/learn-advanced-python-programming-in-2020/
3. https://www.pluralsight.com/courses/advanced-python

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**OVERVIEW**			
1.1	The Context Of Software Development: Software-Development Tools-Learning Programming With Python-Writing A Python Program-A Longer Python Program.	4	Chalk & Talk	Black Board
1.2	Values And Variables:Integer Values-Variables And Assignment-Identifiers-Floating Point Types-Control Code With In Strings-User Input-The Eval Function-Controlling The Print Function.	4	Chalk & Talk	Black Board
1.3	Expressions And Arithmetic: Expression-Operator Precedence And Associativity-Comments-Errors-Arithmetic	4	Group discussion	White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Examples-More Arithmetic Operators-Algorithms (Self Study)			
UNIT -2	**CONDITIONAL STATEMENT AND ITERATION**			
2.1	Conditional Execution :Boolean Expressions- Boolean Expressions – The Simple If Statement – The If/Else Statement	3	Lecture	Smart Board
2.2	Compound Boolean Expressions –Nested Conditionals – Multi-Way Decision Statements	3	Lecture	Black Board
2.3	Conditional Expressions – Errors In Conditional Statements	3	Lecture	Green Board
2.4	Iteration :The While Statement – Definite Loops Vs. Indefinite Loops – The For Statement	3	Chalk & Talk	Black Board
2.5	Nested Loops – Abnormal Loop Termination – Infinite Loops – Iteration Examples	3	Chalk & Talk	Black Board
UNIT -3LISTS& FUNCTIONS				
3.1	**List:**Using Lists – List Assignment and Equivalence – List Bounds – Slicing – Cloning- Nested Lists-List and functions – Prime Generation with a List.	3	Chalk & Talk	Black Board
3.2	List Processing : Sorting – Flexible Sorting – Search – List Permutations – Randomly Permuting a List – Reversing a	4	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	List.			
3.3	**Functions :** Introduction to Functions – Defining – Calling function –Passing Arguments- Keyword Arguments- Default Arguments – Required Arguments – Variable length Arguments .	5	Chalk & Talk	Green Board
3.4	Return Statement – Nesting of Passing Arguments – Anonymous Function- Recursive function – Scope of Local and Global Variables	3	Lecture	Green Board
UNIT -4OBJECT ORIENTED PROGRAMMING PRINCIPLES				
4.1	Class Statement – Class Body- Objects- Class Methods – Self Variable .	3	Chalk & Talk	Black Board
4.2	Class Properties and Instance Properties – Static Method – Data Hiding – Deleting an object – Constructor	5	Lecture	Green Board
4.3	Method Overriding – Inheritance – Composition Object – Abstract classes and interfaces .	5	Chalk & Talk	Black Board
4.4	Metaclass- Operator overloading.–Garbage Collections.	2	Lecture	Green Board
UNIT -5TKINTER , EVENTS & EXCEPTIONS				
5.1	**Tkinter :** Introduction – Widget – Label – Button – Check button – Entry – List	3	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	box – Radio button.			
5.2	Scroll bar – Text- Container – Frame – Menu – Label frame – Message – Combo box – Scale – Canvas.	4	Chalk & Talk	Black Board
5.3	**Events:**Event Object – Binding Call backs to Events – Events Names – Keyboard Events – Mouse events.	4	Chalk & Talk	Black Board
5.4	Handling Exceptions : Motivation – Exception Examples – Handling Exception in Invoked Function - Using Exceptions- Custom Exceptions (Self Study)	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Application development based on case study	3	Assignments	Google class room

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average	Better of W1, W2	M1+M2	MID-SEM TEST				

	5 Mks.	5+5=10 Mks.	15 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the basic programming style in python .	K2	PSO1& PSO2
CO 2	Apply various types of control flow statements in python programs	K2, K3	PSO3,PSO4
CO 3	Identify the structure and components of a python program.	K3 ,K4	PSO5, PSO6
CO 4	Analyze Object oriented programming concepts and techniques in python	K2, K3 & K5	PSO2, PSO3, PSO7
CO 5	Implementing the GUI concepts in Python	K4, K5	PSO8, PSO9

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9
CO1	3	3	1	2	2	1	2	2	2
CO2	1	2	3	3	2	2	2	2	2
CO3	2	1	3	2	3	3	1	1	1
CO4	1	3	2	3	2	1	3	2	2

CO5	**1**	**2**	**3**	**2**	**1**	**2**	**2**	**3**	**3**

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4	PO5	PO6
CO1	3	1	2	1	2	3
CO2	3	1	2	2	1	1
CO3	3	2	1	2	3	2
CO4	3	2	2	2	3	3
CO5	3	1	2	1	2	2

COURSE DESIGNER:

1.Staff Name

Forwarded By

HOD'S Signature

& Name

II M.Sc.,

SEMESTER –III

For those who joined in 2021 onwards

NEW SYLLABUS

Insertion 15%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT13	ADVANCED PYTHON PROGRAMMING	Lecture	5	5

COURSE DESCRIPTION

The course helps to create interest in image processing techniques and infuse research thirst in this area

COURSE OBJECTIVES

- To inculcate ideas and create interest in processing images techniques.
- To provide a research orientation inducing them to pursue research.

UNITS

UNIT I: OVERVIEW (12 Hrs) 15%

Features of Python-History of Python-The Future of Python-Writing and Executing First Python Program-Literal Constants-Variables and Identifiers-Data Types- Input Operation-Comments-Reserved Words-Indentation- Operation and Expressions-Expression in Python –Operations on Strings-Other Data Types-Type Conversion.

Expressions And Arithmetic: Expression-Operator Precedence And Associativity-Comments-Errors-Arithmetic Examples-More Arithmetic Operators-Algorithms (Self study)

UNIT II CONDITIONAL STATEMENT AND ITERATION (15 Hrs)

Conditional Execution :Boolean Expressions- Boolean Expressions – The Simple If Statement – The If/Else Statement – Compound Boolean Expressions –Nested Conditionals – Multi-Way Decision Statements – Conditional Expressions – Errors In Conditional Statements

Iteration :The While Statement – Definite Loops Vs. Indefinite Loops – The For Statement – Nested Loops – Abnormal Loop Termination – Infinite Loops – Iteration Examples

UNIT III : LISTS& FUNCTIONS (15 Hrs)

List: Using Lists – List Assignment and Equivalence – List Bounds – Slicing – Cloning- Nested Lists-List and functions – Prime Generation with a List - List Processing : Sorting – Flexible Sorting – Search – List Permutations – Randomly Permuting a List – Reversing a List-

Functions : Introduction to Functions – Defining – Calling function –Passing Arguments- Keyword Arguments- Default Arguments – Required Arguments – Variable length Arguments – Return Statement – Nesting of Passing Arguments – Anonymous Function- Recursive function – Scope of Local and Global Variables .

UNIT IV: OBJECT ORIENTED PROGRAMMING PRINCIPLES (15 Hrs)

Class Statement – Class Body- Objects- Class Methods – Self Variable – Class Properties and Instance Properties – Static Method – Data Hiding – Deleting an object – Constructor – Method Overriding – Inheritance – Composition Object – Abstract classes and interfaces – Metaclass- Operator overloading.–Garbage Collections.

UNIT V : TKINTER , EVENTS & EXCEPTIONS (15 Hrs)

Tkinter : Introduction – Widget – Label – Button – Check button – Entry – List box – Radio button – Scroll bar – Text- Container – Frame – Menu – Label frame – Message – Combo box – Scale – Canvas.

Events: Event Object – Binding Call backs to Events – Events Names – Keyboard Events – Mouse events.

Database connectivity using MYSQL Connector

Handling Exceptions : Motivation – Exception Examples – Handling Exception in Invoked Function - Using Exceptions- Custom Exceptions (Self Study)

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (3 HRS.)

Application development based on case study

REFERENCES:

3. Richard L.Halterman ,"LEARNING TO PROGRAM WITH PYTHON",ELITE PUBLISHING, 2011
4. Ch. Satyanarayana, M. Radhika mani, B.N. Jagadesh, " Python Programming", Universities press,2018.

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5. https://www.udemy.com/course/learn-advanced-python-programming-in-2020/
6. https://www.pluralsight.com/courses/advanced-python

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 OVERVIEW				
1.1	Features of Python-History of Python-The Future of Python-Writing and Executing First Python Program-Literal Constants-Variables and Identifiers-	4	Chalk & Talk	Black Board
1.2	Data Types- Input Operation-Comments-Reserved Words-	4	Chalk &	Black

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Indentation- Operation and Expressions-Expression in Python –Operations on Strings-Other Data Types-Type Conversion.		Talk	Board
1.3	Expressions And Arithmetic: Expression-Operator Precedence And Associativity-Comments-Errors-Arithmetic Examples-More Arithmetic Operators-Algorithms (Self Study)	4	Group discussion	White board
UNIT -2	**CONDITIONAL STATEMENT AND ITERATION**			
2.1	Conditional Execution :Boolean Expressions- Boolean Expressions – The Simple If Statement – The If/Else Statement	3	Lecture	Smart Board
2.2	Compound Boolean Expressions –Nested Conditionals – Multi-Way Decision Statements	3	Lecture	Black Board
2.3	Conditional Expressions – Errors In Conditional Statements	3	Lecture	Green Board
2.4	Iteration :The While Statement – Definite Loops Vs. Indefinite Loops – The For Statement	3	Chalk & Talk	Black Board
2.5	Nested Loops – Abnormal Loop Termination – Infinite Loops – Iteration Examples	3	Chalk & Talk	Black Board
UNIT -3LISTS& FUNCTIONS				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.1	**List:**Using Lists – List Assignment and Equivalence – List Bounds – Slicing – Cloning- Nested Lists-List and functions – Prime Generation with a List.	3	Chalk & Talk	Black Board
3.2	List Processing : Sorting – Flexible Sorting – Search – List Permutations – Randomly Permuting a List – Reversing a List.	4	Lecture	Green Board
3.3	**Functions :** Introduction to Functions – Defining – Calling function –Passing Arguments- Keyword Arguments- Default Arguments – Required Arguments – Variable length Arguments .	5	Chalk & Talk	Green Board
3.4	Return Statement – Nesting of Passing Arguments – Anonymous Function- Recursive function – Scope of Local and Global Variables	3	Lecture	Green Board
UNIT -4OBJECT ORIENTED PROGRAMMING PRINCIPLES				
4.1	Class Statement – Class Body- Objects- Class Methods – Self Variable .	3	Chalk & Talk	Black Board
4.2	Class Properties and Instance Properties – Static Method – Data Hiding – Deleting an object – Constructor	5	Lecture	Green Board
4.3	Method Overriding – Inheritance – Composition Object – Abstract classes and	5	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	interfaces .			
4.4	Metaclass- Operator overloading.–Garbage Collections.	2	Lecture	Green Board
UNIT -5TKINTER , EVENTS & EXCEPTIONS				
5.1	**Tkinter:** Introduction – Widget – Label – Button – Check button – Entry – List box – Radio button.	3	Lecture	Green Board
5.2	Scroll bar – Text- Container – Frame – Menu – Label frame – Message – Combo box – Scale – Canvas.	4	Chalk & Talk	Black Board
5.3	**Events:** Event Object – Binding Call backs to Events – Events Names – Keyboard Events – Mouse events- Database Connectivity using MYSQL connector.	4	Chalk & Talk	Black Board
5.4	Handling Exceptions : Motivation – Exception Examples – Handling Exception in Invoked Function - Using Exceptions- Custom Exceptions (Self Study)	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Application development based on case study	3	Assignments	Google class room

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the basic programming style in python .	K2	PSO1& PSO2
CO 2	Apply various types of control flow statements in python programs	K2, K3	PSO3,PSO4
CO 3	Identify the structure and components of a python program.	K3 ,K4	PSO5, PSO6
CO 4	Analyze Object oriented programming concepts and techniques in python	K2, K3 & K5	PSO2, PSO3, PSO7
CO 5	Implementing the GUI concepts in Python	K4, K5	PSO8, PSO9

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4

CO1	**3**	**2**	**1**	**1**
CO2	**3**	**2**	**1**	**1**
CO3	**3**	**2**	**1**	**1**
CO4	**3**	**2**	**1**	**1**
CO5	**3**	**2**	**1**	**1**

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1.Staff Name : V. Mageshwari

Forwarded By

HOD'S Signature

& Name

II M.Sc IT
SEMESTER –III

OLD SYLLABUS

Insertion 15%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE6	COMPUTER FORENSICS	Lecture	4	5

For those who joined in 2021 onwards

COURSE DESCRIPTION

The course content plays a vital role in making the students to understand the basic concepts in Computer Forensics.

COURSE OBJECTIVES

To facilitate the student to understand, the basics in digital forensics and techniques for conducting the forensic examination on different digital devices.

UNITS

UNIT –I INTRODUCTION (12 HRS.)

Computer forensics fundamentals - Benefits of forensics - Computer crimes - computer forensics evidence and courts, **legal concerns(Self Study)** and private issues.

UNIT –II INVESTIGATIONS (12 HRS.)

Understanding Computing Investigations – Procedure for corporate High-Tech investigations - understanding data recovery work station and software - conducting and **investigations(Self Study)**.

UNIT –III DATA ACQUISITION (12 HRS.)

Understanding storage formats and digital evidence - determining the best acquisition method - acquisition tools - validating data acquisitions - performing RAID data acquisitions - remote network acquisition tools - other forensics **acquisitions tools(Self Study)**.

UNIT –IV PROCESSING CRIMES AND INCIDENT SCENES (12 HRS.)

Securing a computer incident or crime - seizing digital evidence at scene - storing digital evidence - obtaining digital hash -**reviewing case(Self Study)**.

UNIT –V TOOLS (11 HRS.)

Current computer forensics tools- software, hardware tools - validating and testing forensic software - **specialized E-Mail forensics tool(Self Study)**.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (1 HR.)

Reviewing cases

REFERENCE BOOKS:

1) Warren G. Kruse II and Jay G. Heiser, "Computer Forensics: Incident Response Essentials", Addison Wesley, 2002.
2) Nelson, B, Phillips, A, Enfinger, F, Stuart, C., "Guide to Computer Forensics and Investigations, 2nd ed., Thomson Course Technology, 2006, ISBN: 0-619-21706-5.
3) Vacca, J, Computer Forensics, Computer Crime Scene Investigation, 2nd Ed, Charles River Media, 2005, ISBN: 1-58450-389.

Digital Open Educational Resources (DOER) :.

1) https://www.geeksforgeeks.org/introduction-of-computer-forensics/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1INTRODUCTION				
1.1	Computer forensics fundamentals	3	Discussion	Black Board
1.2	Benefits of forensics	3	Chalk & Talk	Black Board
1.3	Computer crimes	3	Lecture	LCD
1.4	Computer forensics evidence and courts, legal concerns and private issues.	3	Discussion	Google classroom
UNIT -2INVESTIGATIONS				
2.1	Understanding Computing Investigations	3	Lecture	PPT & White board
2.2	Procedure for corporate High-Tech investigations	3	Chalk & Talk	Green Board
2.3	Understanding data recovery work station and software	3	Chalk & Talk	Black Board
2.4	Conducting and investigations.	3	Chalk & Talk	Black Board
UNIT – 3 DATAACQUISITION				
3.1	Understanding storage formats and digital evidence	3	Discussion	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.2	Determining the best acquisition method - acquisition tools	3	Chalk &Talk	Green Board
3.3	Validating data acquisitions - performing RAID data acquisitions	3	Chalk & Talk	Black Board
3.4	Remote network acquisition tools - other forensics acquisitions tools.	3	Chalk & Talk	Black Board
UNIT – 4 PROCESSING CRIMES AND INCIDENT SCENES				
4.1	Securing a computer incident or crime	3	Discussion	PPT & White board
4.2	Seizing digital evidence at scene	3	Chalk & Talk	Green Board
4.3	Storing digital evidence	3	Chalk & Talk	Black Board
4.4	Obtaining digital hash - reviewing case.	3	Chalk & Talk	Black Board
UNIT – 5 TOOLS				
5.1	Current computer forensics tools- software, hardware tools	6	Lecture	PPT & White board
5.2	Validating and testing forensic software	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.4	specialized E-Mail forensics tool.	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Reviewing Cases	1	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A	Section B	Section C	Section D	Section E	Total	

	10 Mks	20 Mks.	10 Mks	10 Mks.	10 Mks.	60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

  Nos

  C1 - Test (CIA 1) 1 - 10 Mks

C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

****The best out of two will be taken into account***

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand basic concepts in Computer forensics.	K1	PSO1, PSO2 &PSO3
CO 2	Explain different investigation procedures.	K1, K2	PSO1, PSO3 & PSO4
CO 3	Understand different Data acquisition mode.	K1 & K3	PSO1, PSO3 & PSO8
CO 4	Understand investigation process using computer forensics.	K1, K2, K3	PSO2, PSO3, PSO5, PSO7 & PSO8
CO 5	Know how to apply forensic analysis tools to recover important evidence for identifying computer crime.	K1 & K3	PSO2, PSO4, PSO7, PSO8 & PSO9

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7	PSO 8	PSO 9
CO1	3	3	3	1	1	1	1	1	1
CO2	3	1	3	3	1	1	1	1	1

CO3	**3**	**3**	**1**	**1**	**2**	**2**	**1**	**3**	**1**
CO4	**1**	**3**	**3**	**1**	**3**	**1**	**3**	**3**	**1**
CO5	**1**	**3**	**2**	**3**	**2**	**1**	**3**	**3**	**3**

Mapping of COs with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	1	2	3	1
CO4	1	3	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Dr. V. Jane Varamani Sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name

II M.Sc IT
SEMESTER –III

NEW SYLLABUS

Insertion 15%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE6	COMPUTER FORENSICS	Lecture	4	5

For those who joined in 2021 onwards

COURSE DESCRIPTION

The course content plays a vital role in making the students to understand the basic concepts in Computer Forensics.

COURSE OBJECTIVES

To facilitate the student to understand, the basics in digital forensics and techniques for conducting the forensic examination on different digital devices.

UNITS

UNIT –I INTRODUCTION (12 HRS.)

Computer forensics fundamentals - Benefits of forensics - Computer crimes - computer forensics evidence and courts, **legal concerns(Self Study)** and private issues.

UNIT –II INVESTIGATIONS (12 HRS.)

Understanding Computing Investigations – Procedure for corporate High-Tech investigations - understanding data recovery work station and software - conducting and **investigations(Self Study)**.

UNIT –III DATA ACQUISITION (12 HRS.)

Understanding storage formats and digital evidence - determining the best acquisition method - acquisition tools - validating data acquisitions - performing RAID data acquisitions - remote network acquisition tools - other forensics **acquisitions tools(Self Study)**.

UNIT –IV PROCESSING CRIMES AND INCIDENT SCENES (12 HRS.)

Securing a computer incident or crime - seizing digital evidence at scene - storing digital evidence - obtaining digital hash -**reviewing case(Self Study)**.

UNIT –V TOOLS (11 HRS.)

Current computer forensics tools- software, hardware tools - validating and testing forensic software - addressing data-hiding techniques - performing remote acquisitions - E-Mail investigations- investigating email crime and violations - understanding E-Mail servers -**specialized E-Mail forensics tool (Self Study)**.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (1 HR.)

Reviewing cases

REFERENCE BOOKS:

4) Warren G. Kruse II and Jay G. Heiser, "Computer Forensics: Incident Response Essentials", Addison Wesley, 2002.
5) Nelson, B, Phillips, A, Enfinger, F, Stuart, C., "Guide to Computer Forensics and Investigations, 2nd ed., Thomson Course Technology, 2006, ISBN: 0-619-21706-5.
6) Vacca, J, Computer Forensics, Computer Crime Scene Investigation, 2nd Ed, Charles River Media, 2005, ISBN: 1-58450-389.

Digital Open Educational Resources (DOER) :.

2) https://www.geeksforgeeks.org/introduction-of-computer-forensics/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1INTRODUCTION				
1.1	Computer forensics fundamentals	3	Discussion	Black Board
1.2	Benefits of forensics	3	Chalk & Talk	Black Board
1.3	Computer crimes	3	Lecture	LCD
1.4	Computer forensics evidence and courts, legal concerns and private issues.	3	Discussion	Google classroom
UNIT -2INVESTIGATIONS				
2.1	Understanding Computing Investigations	3	Lecture	PPT & White board
2.2	Procedure for corporate High-Tech investigations	3	Chalk & Talk	Green Board
2.3	Understanding data recovery work station and software	3	Chalk & Talk	Black Board
2.4	Conducting and investigations.	3	Chalk & Talk	Black Board
UNIT – 3 DATAACQUISITION				
3.1	Understanding storage formats and digital evidence	3	Discussion	PPT & White board
3.2	Determining the best	3	Chalk	Green

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	acquisition method - acquisition tools		&Talk	Board
3.3	Validating data acquisitions - performing RAID data acquisitions	3	Chalk & Talk	Black Board
3.4	Remote network acquisition tools - other forensics acquisitions tools.	3	Chalk & Talk	Black Board
UNIT – 4 PROCESSING CRIMES AND INCIDENT SCENES				
4.1	Securing a computer incident or crime	3	Discussion	PPT & White board
4.2	Seizing digital evidence at scene	3	Chalk & Talk	Green Board
4.3	Storing digital evidence	3	Chalk & Talk	Black Board
4.4	Obtaining digital hash - reviewing case.	3	Chalk & Talk	Black Board
UNIT – 5 TOOLS				
5.1	Current computer forensics tools- software, hardware tools	3	Lecture	PPT & White board
5.2	Validating and testing forensic software - addressing data	2	Chalk & Talk	Black Board
5.3	Hiding techniques - performing remote acquisitions - E-Mail	3	Lecture	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	investigations- investigating			
5.4	Email crime and violations - understanding E-Mail servers - specialized E-Mail forensics tool.	3	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Reviewing Cases	1	Discussion	Black Board

INTERNAL - PG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	20 %
K3	2	2	-	5	-	9	-	9	22.5 %
K4	2	2	-	-	5	9	-	9	22.5 %
K5	2	2	5	-	-	9	-	9	22.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - PG

Levels	Section A 10 Mks	Section B 20 Mks.	Section C 10 Mks	Section D 10 Mks.	Section E 10 Mks.	Total 60Mks.	
K2	10	5	-	-	-	15	25 %
K3	-	5	10	-	-	15	25 %
K4	-	5	-	-	10	15	25 %
K5	-	5	-	10	-	15	25 %
Total	10	20	10	10	10	60	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

- **PG CIA Components**

Nos					
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	2 *	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Seminar	1	-	5 Mks
C6	-	Attendance		-	5 Mks

The best out of two will be taken into account

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand basic concepts in Computer forensics.	K1	PSO1, PSO2 &PSO3
CO 2	Explain different investigation procedures.	K1, K2	PSO1, PSO3 & PSO4
CO 3	Understand different Data acquisition mode.	K1 & K3	PSO1, PSO3 & PSO8
CO 4	Understand investigation process using computer forensics.	K1, K2, K3	PSO2, PSO3, PSO5, PSO7 & PSO8
CO 5	Know how to apply forensic analysis tools to recover important evidence for identifying computer crime.	K1 & K3	PSO2, PSO4, PSO7, PSO8 & PSO9

Mapping COs Consistency with PSOs

CO/	PS	PSO	PSO	PSO	PSO	PSO	PSO	PSO	PSO

PSO	O1	2	3	4	5	6	7	8	9
CO1	3	3	3	1	1	1	1	1	1
CO2	3	1	3	3	1	1	1	1	1
CO3	3	3	1	1	2	2	1	3	1
CO4	1	3	3	1	3	1	3	3	1
CO5	1	3	2	3	2	1	3	3	3

Mapping of COs with Pos

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	1	2	3	1
CO4	1	3	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**

COURSE DESIGNER:

2. **Dr. V. Jane Varamani Sulekha**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name

OLD SYLLABUS

Deletion 20%

II M.Sc.

SEMESTER –III

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE8	INTERNET OF THINGS	PG Core	5Hrs.	5

COURSE DESCRIPTION

This Course provides knowledge of development cycle of IoT systems with sample systems. And explains the different sources needed with the integration process to build IoT systems

COURSE OBJECTIVES

- To understand the fundamentals of Internet of Things.
- To apply the concept of Internet of Things in the real world scenario.

UNITS

UNIT I : INTRODUCTION TO INTERNET OF THINGS (14 Hrs)

Introduction – Physical Design of IoT –Logical Design of IoT – IoT Enabling Technologies – **IoT Levels & Deployment Templates(Self Study)**

UNIT II : DOMAIN SPECIFIC IOTS (14 Hrs)

Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – **Health & Lifestyle (Self Study)**

UNIT III IOT AND M2M (14 Hrs)

Introduction – M2M- Difference between IoT and M2M – SDN and NFV for IoT . IoT System Management with NETCONF-YANG : Need for IoT Systems Management – **Simple Network Management Protocol(SNMP) – Network Operator Requirements(Self Study)**

UNIT IV: IOT PLATFORMS DESIGN METHODOLOGY (14 Hrs)

Introduction –IoT Design Methodology . IoT Physical Devices & Endpoints **:**

What is an IoT Device – Exemplary Device : Raspberry Pi- About the Board – **Linux on Raspberry Pi – Raspberry Pi Interfaces(Self Study)**

UNIT V CASE STUDIES ILLUSTRATING IOT DESIGN (14 Hrs)

Introduction – Home Automation – Cities – Environment – Agriculture – **Productivity Applications. (Self Study)**

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)

Current scenario in IOT technologies

REFERENCES:

1. Adrian McEwen & Hakim Cassimally,"Designing the Internet of Things",WILEY, 2017
2. Raj Kamal ,"INTERNET OF THINGS ARCHITECTURE AND DESIGN PRINCIPLES",McGraw Hill Education , 2017
3. OLIVIER HERSENT ,DAVID BOSWARTHICK , OMAR ELLOUMI, "The Internet of Things", WILEY ,2015

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION TO INTERNET OF THINGS				
1.1	Introduction – Physical Design of IoT	4	Chalk & Talk	Black Board
1.2	Logical Design of IoT – IoT Enabling Technologies	6	Chalk & Talk	LCD
1.3	IoT Levels & Deployment Templates(Self Study)	4	Lecture	PPT & White board
UNIT -2 DOMAIN SPECIFIC IOTS				
2.1	Introduction – Home Automation	6	Lecture	Smart Board
2.2	Cities – Environment – Energy – Retail	3	Lecture	Black Board
2.3	Logistics – Agriculture – Industry	3	Chalk & Talk	Black Board
2.4	Health & Lifestyle(Self Study)	2	Chalk & Talk	Black Board
UNIT -3 IOT AND M2M				
3.1	Introduction – M2M- Difference between IoT and M2M	4	Chalk & Talk	Black Board
3.2	SDN and NFV for IoT . IoT System Management with NETCONF-YANG : Need for IoT Systems Management	6	Chalk & Talk	Green Board
3.3	Simple Network Management Protocol(SNMP) – Network Operator Requirements(Self	4	Lecture	Smart Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Study)			
UNIT -4	**IOT PLATFORMS DESIGN METHODOLOGY**			
4.1	Introduction –IoT Design Methodology . IoT Physical Devices & Endpoints	4	Lecture	Smart Board
4.2	What is an IoT Device – Exemplary Device : Raspberry Pi- About the Board	6	Chalk & Talk	Green Board
4.3	Linux on Raspberry Pi – Raspberry Pi Interfaces(Self Study)	4	Assignments	Google class room
UNIT -5	**CASE STUDIES ILLUSTRATING IOT DESIGN**			
5.1	Introduction – Home Automation	6	Lecture	Smart Board
5.2	Cities – Environment – Agriculture	5	Chalk & Talk	Green Board
5.3	Productivity Applications(Self Study)	3	Assignments	Google class room
UNIT -6	**DYNAMISM**			
6.1	Current scenario in IOT technologies	5	Assignments	Google class room

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	Session - wise Average 5 Mks.	Better of W1, W2 5+5=10 Mks.	M1+M2 15 Mks	MID-SEM TEST 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	5	-	-	2 ½	-		-	-
K2	-	5	4	2 ½	5		5	12.5 %
K3	-	-	3	5	12		12	30 %
K4	-	-	3	5	9		9	22.5%
Non Scholastic	-	-	-	-	9		9	22.5 %
Total	5	5	10	15	35	5	40	100 %

CIA	
Scholastic	35
Non Scholastic	5
	40

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
5	10	15	5	5	40	60	100

C1 – Average of Two Session Wise Tests

C2 – Average of Two Monthly Tests

C3 - Mid Sem Test

C4 – Best of Two Weekly Tests

C5 – Non - Scholastic

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the basic concepts of IoT	K2	PSO1, PSO2
CO 2	Discuss physical and logical design of IoT enabled technologies	K2,K3	PSO2,PSO3
CO 3	Analyze how and where IoT can be applied	K3,K4	PSO5, PSO9
CO 4	Compare M2M and IoT	K2,K3,K4	PSO1, PSO3 PSO9
CO 5	Analyse the features of Python used for IoT implementation	K4,K5	PSO6, PSO8

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Mrs. T. Charanya Nagammal

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2021 onwards

NEW SYLLABUS

Insertion 20%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE8	INTERNET OF THINGS	PG Core	5Hrs.	5

COURSE DESCRIPTION

This Course provides knowledge of development cycle of IoT systems with sample systems. And explains the different sources needed with the integration process to build IoT systems

COURSE OBJECTIVES

- To understand the fundamentals of Internet of Things.
- To apply the concept of Internet of Things in the real world scenario.

UNITS

UNIT I: INTRODUCTION TO IOT: [14 HRS]

Introduction to Internet of Things: Introduction – Physical Design of IoT – Logical Design of IoT – IoT Enabling Technologies – IoT & Deployment Templates. Domain Specific IoTs: Introduction – Home Automation – Cities – Environment – Energy – Retail – Logistics – Agriculture – Industry – Health & Life style.

UNIT II: IOT AND M2M : [14 HRS]

Introduction : M2M – Difference between IoT and M2M – SDN and NFV for IoT**. IoT System Management with NETCONF-YANG :** Need for IoT Systems Management – Simple Network Management Protocol (SNMP) – Network Operator Requirements – NETCONF- YANG – IoT Systems Management with NETCONF_YANG.

UNIT III: IOT PLATFORMS DESIGN METHODOLOGY: [14 HRS]

Introduction – IoT Design Methodology – Case Study on IoT System for Weather Monitoring – Motivation for using Python. **IoT Systems –Logical Design using Python:** Introduction – Installing Python – Python Data types & Data Structures – Control Flow – Functions – Modules – Packages – File Handling – Date/Time Operations – Classes – Python packages of Interest for IoT.

UNIT IV: IOT PHYSICAL DEVICES & ENDPOINTS: [14 HRS]

What is an IoT Device – Exemplary Device: Raspberry Pi – About the Board – Linux on Raspberry Pi – Raspberry Pi Interfaces – Programming Raspberry Pi with Python – Other IoT devices.

IoT Physical Servers & Cloud Offerings : Introduction to Cloud Storage Models & Communication APIs – WAMP - AutoBahn for IoT– Xively Cloud for IoT – Python Web application Framework-Django – Designing a REST ful 631

Web API – Amazon Web Services for IoT – SkynetIoT messaging platform.

UNIT V: ADVANCED IOT: [14 HRS]

Data Analytics for IoT : Introduction – Apache Hadoop – Using Hadoop Map Reduce for Batch Data Analysis – Apache Oozier – Apache Spark – Apache Storm – Using Apache Storm for Real-time Data Analysis.

UNIT –VI DYNAMISM (Evaluation Pattern-CIA only) (5 HRS.)

Current scenario in IOT technologies

TEXT BOOK:

1. Internet of Things, Arshdeep Bahga, Vijay Madisetti, Universities Press (INDIA) Private Ltd., 2015.

Unit I : Chapters 1 and2

Unit II : Chapters 3 and 4

Unit III : Chapters 5 and 6

Unit IV : Chapters 7 and 8

Unit V : Chapters 9 and 10

REFERENCE BOOKS:

1. Getting Started with the Internet of Things, CunoPfister, O'Relly, 2011.

2. Designing the Internet of Things, AdrianMcewen, HakinCassimally, Willey,2015.

3. The Internet of Things in the Cloud: A Middleware Perspective,Honbo Zhou, CRC Press, 2012.

4. Architecting the Internet of Things, Dieter Uckelmann; Mark Harrison; Florian Michahelles, (Eds.) Springer, 2011.

5. The Internet of Things , Key Applications and Protocols, Oliver Hersent, David Boswarthick, Omar Elloumi, Wiley , 2017

WEB REFERNCES :

1. https://www.iotforall.com/what–is–iot–simple–explanation/
2. https://internetofthingsagenda.techtarget.com/definition/Internet–of–Things–IoT
3. https://www.ibm.com/blogs/internet–of–things/what–is–the–iot/

DOER REFERNCE :

https://nptel.ac.in/courses/106/105/106105166/

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 1	Understand the basic concepts of IoT	K2	PSO1, PSO2
CO 2	Discuss physical and logical design of IoT enabled technologies	K2,K3	PSO2,PSO3
CO 3	Analyze how and where IoT can be applied	K3,K4	PSO5, PSO9
CO 4	Compare M2M and IoT	K2,K3,K4	PSO1, PSO3 PSO9
CO 5	Analyse the features of Python used for IoT implementation	K4,K5	PSO6, PSO8

Mapping of COs with PSOs

CO/ PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9
CO1	3	2	1	3	2	1	1	1	1
CO2	1	1	2	3	2	3	1	1	1
CO3	2	1	1	1	3	3	1	1	1
CO4	1	1	1	3	1	1	1	1	3
CO5	1	1	2	1	2	3	1	3	2

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4
CO1	3	2	1	1
CO2	3	2	1	1
CO3	3	2	1	1
CO4	3	2	1	1
CO5	3	2	1	1

Note: ♦ Strongly Correlated – **3** ♦ Moderately Correlated – **2**

♦ Weakly Correlated -**1**

COURSE DESIGNER:

1. **Staff Name T. Charanya Nagammal**

Forwarded By

HOD'S Signature

& Name