FATIMA COLLEGE (AUTONOMOUS)

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

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT : INFORMATION TECHNOLOGY

NAME OF THE PROGRAMME : M. Sc.

PROGRAMME CODE : PSIT

ACADEMIC YEAR : 2023-24

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

- ᚦ Empower women by teaching them technology and life lessons.

- ᚦ Encourage students to be the change in the society.

- ᚦ Educate students and prepare them in various aspects of IT industry.

- ᚦ Provide leadership quality for effective strategic and tactical planning in use of technology.

- ᚦ 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						
23PG1I1	Python Programming	5	5	40	60	100
23PG1I2	Python Programming Practical	5	5	40	60	100
23PG1I3	Web Development using Wordpress	4	4	40	60	100
SEMESTER - II						
23PG2I4	Database Systems	5	5	40	60	100
23PG2I5	RDBMS Lab	5	5	40	60	100
23PG2I6	Open Source Technologies Practical	4	4	40	60	100
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 AdvancedPython Programming	5	3	40	60	100
SEMESTER - IV						
21PG4IT16	Biometrics	-	4	40	60	100

MAJOR ELECTIVE / EXTRA DEPARTMENTAL COURSE / INTERNSHIP/ PROJECT

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. Mks
1.	I	23PG1IAE	Image Editing and Animation	2	1	40	60	100
2.		23PG1IE1 23PG1IE2	Elective – I Data Structures Natural Language Processing	5	3	40	60	100
3.		23PG1IE3 23PG1IE4	Elective - II Operating Systems Human Computer Interaction	5	3	40	60	100
4.	II	23PG2ISE1	E-Commerce and Content Management Systems	3	2	40	60	100
5.		23PG2IE5 23PG2IE6	Elective – III Networks and Security Biometric Techniques	4	3	40	60	100
6.		23PG2IE7 23PG2IE8	Elective – IV Object Oriented Analysis and Design Software Project Management	4	3	40	60	100
7.	III	21PG3ITE4 22PG3ITE5 21PG3ITE6	Elective - II Software Testing System Software & Compiler Design Computer Forensics	5	5	40	60	100

8.		21PG3ITE7 21PG3ITE8 22PG3ITE9	Elective - III Big Data Analytics Internet of Things Algorithm Design and Analysis	5	5	40	60	100
9.		19PG3ITSI	Summer Internship	-	3	40	60	100
10.	IV	19PG4ITPR	Project& Viva Voce	-	6	40	60	100

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	-	2	IV	-	-	100

8

	for all the papers by the respective course teachers)						
	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
21PGCASLIT1	**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	-	Minimum 2	I – IV	-	-	

	Certified online Courses (Department Specific Courses/any other courses) * Students can opt other than the listed course from UGC-SWAYAM /UGC /CEC		Cred its					

- **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

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Skill Development 100%

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I M.Sc.,

SEMESTER –I

For those who joined in 2023 onwards

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
PSIT	23PG1I1	**PYTHON PROGRAMMING**	Lecture	7	5

COURSE DESCRIPTION

This course introduces the Basic understanding onobject oriented programming concepts.

COURSE OBJECTIVES

To acquire programming skills in core Python and to develop database applications in Python.

UNITS

UNIT I: CORE PYTHON (14Hrs)

Introduction - Python Basics: Comments - Statements and syntax - variable Assignment - Identifiers - **Python objects:** Built-in-types - Internal types - Standard Type operators - Standard type Built-in-functions. **Numbers :** Introduction to Numbers - Integers - Floating point numbers - Complex numbers - Operators - Built-in and factory functions – Conditionals and Loops -**Sequences : Strings, Lists and Tuples(Self study)**

UNIT II: FUNCTIONS AND FUNCTIONAL PROGRAMMING (14Hrs)

Mapping and set types.- Introduction - Calling functions - Creating functions - passing functions - Formal arguments - Variable - Length Arguments - Functional Programming - Variable Scope – Recursion

11

UNIT III: MODULES AND OBJECT ORIENTED (14Hrs)

Modules: Modules and Files – namespaces - Importing Modules - Features - Built-in functions. **Object Oriented Programming**: Introduction - Object Oriented Programming – Encapsulation Inheritance – Polymorphism - **Errors and Exceptions**: Introduction – Exceptions in Python.

UNIT IV: GUI PROGRAMMING (14Hrs)

Introduction – **Using Widgets**: Core widgets- Generic widget properties – Labels – Buttons – Radio Buttons – Check Buttons – Text – Entry – List Boxes – Menus – Frame – Scroll Bars – Scale

UNIT V: DATABASE PROGRAMMING (14Hrs)

Connecting to a database using MongoDB - Creating Tables - INSERT-UPDATE - DELETE - **READ operations (Self Study)**

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

Current trends in implementation of Python Programming in Machine Learning Techniques.

Recommended Text:

1. *Wesley J. Chun, (2007), "Core Python Programming", Pearson Education, Second Edition – (Unit I, II, III).*

2. *Charles Dierbach, (2015), "Introduction to Computer Science Using Python A Computational Problem-Solving Focus", Wiley India Edition- (Unit III- Object Oriented Programming)*

3. *Martin C Brown, (2018), "The Complete Reference Python", McGraw Hill Education (India) Private Limited – (Unit IV)*

Reference Books:

1. *MarkLutz,(2013),"LearningPythonPowerfulObjectOrientedProgrammi ng",O"reillyMedia,5 th Edition.*

2. *TimothyA.Budd,(2011),"ExploringPython",TataMCGrawHillEducatio nPrivateLimited,First Edition.*

3. *AllenDowney,JeffreyElkner,ChrisMeyers,(2012),"Howtothinklikeaco mputerscientist:learningwithPython"*

Digital Open Educational Resources (DOER) :

1. http://interactivepython.org/courselib/static/pythonds

2. http://www.ibiblio.org/g2swap/byteofpython/read/

3. http://www.diveintopython3.net/

4. http://docs.python.org/3/tutorial/index.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**CORE PYTHON**			
1.1	Introduction - Python Basics: Comments - Statements and syntax - variable Assignment - Identifiers	5	Chalk & Talk	Black Board
1.2	Built-in-types - Internal types - Standard Type operators - Standard type Built-in-functions	6	Chalk & Talk	LCD
1.3	Introduction to Numbers - Integers - Floating point numbers - Complex numbers	3	Discussion	Google Classroom
1.4	Operators - Built-in and factory functions – Conditionals and Loops - **Sequences : Strings, Lists and Tuples (Self study)**	3	Chalk & Talk	LCD
UNIT -2	**FUNCTIONS AND FUNCTIONAL PROGRAMMING**			

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	Mapping and set types.- Introduction - Calling functions	6	Lecture	Green Board
2.2	Functional Programming - Variable Scope – Recursion	5	Chalk &Talk	Green Board
2.3	Functional Programming - Variable Scope – Recursion	3	Discussion	Google Classroom
UNIT -3 MODULES AND OBJECT ORIENTED				
3.1	**Modules:** Modules and Files – namespaces -	4	Chalk & Talk	Black Board
3.2	Importing Modules - Features - Built-in functions.	5	Chalk & Talk	LCD
3.3	**Object Oriented Programming**: Introduction - Object Oriented Programming – Encapsulation Inheritance – Polymorphism -	3	Chalk & Talk	Black Board
3.4	**Errors and Exceptions**: Introduction – Exceptions in Python	3	Lecture	Green Board
UNIT -4 GUI PROGRAMMING				
4.1	Introduction – **Using Widgets**: Core widgets- Generic widget properties	3	Chalk & Talk	Black Board
4.2	Labels – Buttons – Radio Buttons – Check Buttons – Text	6	Lecture	Green Board
4.3	Entry – List Boxes – Menus – Frame – Scroll Bars – Scale	3	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -5 DATABASE PROGRAMMING				
5.1	Connecting to a database using MongoDB -	6	Chalk & Talk	Black Board
5.2	Creating Tables - INSERT- UPDATE - DELETE - **READ operations (Self Study)**	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Current trends in implementation of Python Programming in Machine Learning Techniques.	5	Assignments	Google class room

- **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:

SNO.	COURSE OUTCOMES
CO 1	Explainthebasicconceptsinpythonlanguage.
CO 2	Applythevariousdatatypesandidentifytheusageofcontrolstatements,loops,functionsand modules in python forprocessingthedata
CO 3	Analyzeandsolveproblemsusingbasicconstructsandtechniquesofpython.
CO 4	Assesstheapproachesusedinthedevelopmentof interactiveapplication.
CO 5	Tobuildrealtimeprogramsusingpython

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	3	2
CO3	3	2	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	13	15	15	13	15

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**

HOD'S Signature

& Name

I M.Sc.,

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1I2	PYTHON PROGRAMMING PRACTICAL	Practical	7	5

COURSE DESCRIPTION

This course introduces the Basic implementation python programming concepts.

COURSE OBJECTIVES

This course gives practical experience in Python basics, Object Oriented programming like Classes, Inheritance, and Polymorphism, GUI Applications and Database connection.

UNITS - List of Programs

1. Python Basic programs

2. Control Structures

3. Lists

4. Functions and Recursions

5. Modules

6. String Processing

7. Dictionaries and Sets

8. Classes and Objects

9. Polymorphism

10. Inheritance

11. GUI Application

12. Working with Database

Recommended Text:

1. *Wesley J. Chun, (2007), "Core Python Programming", Pearson Education, Second Edition.*

Reference Books:

1. *MarkLutz,(2013),"LearningPythonPowerfulObjectOrientedProgramming",O¨reillyMedia,5 th Edition.*

2. *TimothyA.Budd,(2011),"ExploringPython",TataMCGrawHillEducationPrivateLimited,First Edition.*

3. *AllenDowney,JeffreyElkner,ChrisMeyers,(2012),"Howtothinklikeacomputerscientist:learningwithPython"*

Digital Open Educational Resources (DOER) :

5. http://interactivepython.org/courselib/static/pythonds

6. http://www.ibiblio.org/g2swap/byteofpython/read/

7. http://www.diveintopython3.net/

8. http://docs.python.org/3/tutorial/index.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1	Program using Python Basic Concepts	6	Demonstration	Desktop PC
2	Program using Control Structures.	6	Demonstration	Desktop PC

3	Program using List.	6	Demonstration	Desktop PC
4	Program using Functions.	6	Demonstration	Desktop PC
5	Program using Recursion.	6	Demonstration	Desktop PC
6	Programs Using Modules.	6	Demonstration	Desktop PC
7	Program using String Processing	6	Demonstration	Desktop PC
8	Program using Dictionaries and Set.	6	Demonstration	Desktop PC
9	Program using Classes and Objects.	6	Demonstration	Desktop PC
10	Program using Inheritance	6	Demonstration	Desktop PC
11	Program using GUI Applications.	6	Demonstration	Desktop PC
12	Working with Database	6	Demonstration	Desktop PC

- **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:

S.NO.	COURSE OUTCOMES
CO 1	Understandthesignificanceofcontrolstatements,loopsandfunctionsin creatingsimpleprograms.
CO 2	plythecoredatastructuresavailableinpythontostore,processandsortthe data
CO 3	Analyzethe realtimeproblemusingsuitablepython concepts
CO 4	Assessthecomplexproblemsusingappropriateconceptsinpython
CO 5	Developtherealtimeapplicationsusingpythonprogramminglanguage.

Mapping of C0s with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	3	2
CO3	3	2	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	13	15	15	13	15

Mapping of COs with POs

CBCS Curriculum for M. Sc Information Technology

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**

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For those who joined in 2023 onwards

Employability 100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1I3	WEB DEVELOPEMENT USING WORDPRESS	Practical	6	4

COURSE DESCRIPTION

This course introduces the Basic understanding of HTML & CSS concepts along with Word Press.

COURSE OBJECTIVES

The primary course objective of this paper is to learn the fundamentals of basic web concepts, HTML, DHTML, JavaScript and Word Press.

UNITS

UNIT I: INTRODUCTION (14Hrs)

Introduction to HTML - Lists - Adding Graphics to HTML Documents - Tables -Linking Documents - Frames- Developing HTML Forms

UNIT II: DHTML & CSS (14Hrs)

Dynamic HTML - Cascading Style Sheets - Use of SPAN Tag - External Style Sheets -Use of DIV Tag - Developing Websites

UNIT III: JAVASCRIPT

(14Hrs)

Introduction to JavaScript - JavaScript in Web Pages - Advantages - Writing JavaScript into HTML - Basic Programming Techniques - Operators and

Expressions- JavaScript Programming Construct: Conditional Checking, Controlled Loops, Functions: Built-in Functions, User-Defined Functions - Placing Text in a Browser - Dialog Boxes.

UNIT IV: DOCUMENT OBJECT MODEL (14Hrs)

JavaScript Document Object Model: Introduction - Understanding Objects in HTML - Handling Events using JavaScript. Forms used by a Website: Form Object - Built-in Objects

UNIT V: WORD PRESS (14Hrs)

Word Press: Installation - Stetting and administration- Word press: Theming basics - Our First Word Press Website - Theme Foundation - Menu and navigation - Home page - Dynamic Sidebars and Widgets - Page - archive Page results - Testing and Launching

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

Creating Website and Blogs.

Recommended Text:

1. *Ivan N. Bayross, (2005), Web Enabled Commercial Applications Development Using HTML, DHTML, JavaScript, perlCGI, 3rd Edition, BPB Publications. (Unit I, II, III and IV)*

2. *Jesse Friedman,(2012), Web Designer's Guide to WordPress: Plan, Theme, Build, Launch (Voices That Matter), 1st Edition , New Riders. (Unit V)*

Reference Books:

1. *N.P. Gopalan, J. Akilandeswari, (2009), Web Technology: A Developer"s Perspective, Eastern Economy Edition, PHI Learning Private Limited.*

2. *Deitel&Deitel, (2000), Internet and World Wide Web How to program, Prentice Hall.*

3. *Jon Duckett, (2004), Beginning Web Programming with HTML, XHTML, and CSS, Wiley Publishing, I*

Digital Open Educational Resources (DOER) :

1. http://www.sergey.com/web_course/content.html

2. http://www.pageresource.com/jscript/index.html

3. http://www.peachpit.com/guides/content.aspx

   https://www.tutorialspoint.com/wordpress/index.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	**Introduction to HTML** - Lists - Adding Graphics to HTML Documents - Tables	5	Chalk & Talk	Black Board
1.2	-Linking Documents - Frames-Developing HTML Forms	6	Chalk & Talk	LCD
UNIT -2	**DHTML AND CSS**			
2.1	**Dynamic HTML** - Cascading Style Sheets	6	Lecture	Green Board
2.2	Use of SPAN Tag - External Style Sheets	5	Chalk &Talk	Green Board
2.3	Use of DIV Tag - Developing Websites	3	Discussion	Google Classroom
UNIT -3	**JAVASCRIPT**			
3.1	Introduction to JavaScript - JavaScript in Web Pages - Advantages - Writing JavaScript into HTML -	4	Chalk & Talk	Black Board
3.2	Basic Programming Techniques - Operators and Expressions-JavaScript Programming Construct:	5	Chalk & Talk	LCD
3.3	Conditional Checking, Controlled Loops, Functions:	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.4	Built-in Functions, User-Defined Functions - Placing Text in a Browser - Dialog Boxes.	3	Lecture	Green Board
UNIT -4 DOCUMENT OBJECT MODEL				
4.1	**JavaScript Document Object Model:** Introduction - Understanding Objects in HTML.	3	Chalk & Talk	Black Board
4.2	Handling Events using JavaScript	6	Lecture	Green Board
4.3	Forms used by a Website: Form Object - Built-in Objects	3	Chalk & Talk	LCD
UNIT -5 WORD PRESS				
5.1	**Word Press:** Installation - Stetting and administration- Word press: Theming basics.	6	Chalk & Talk	Black Board
5.2	Our First Word Press Website - Theme Foundation - Menu and navigation	4	Discussion	Google Classroom
5.3	Home page - Dynamic Sidebars and Widgets - Page - archive Page results - Testing and Launching	6	Chalk & Talk	Black Board
UNIT -6 DYNAMISM				
6.1	Creating Website and Blogs.	5	Assignments	Google class

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
				room

- **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
CO 1	Identifythe tools whichwillbesuitableforthe requirement ofthe webpage.
CO 2	ImplementJavascriptandStyleSheetseffectivelyintheWebPages
CO 3	Analyzethedifferenttoolsandbuilt-infunctionsavailabletobeappliedinthe webpage
CO 4	RatethedesignandeffectivenessoftheWebPages created.
CO 5	Design andpublishawebsiteusingWordpress

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	2	2	3
CO2	3	3	3	2	2	3

CO3	3	3	3	2	2	3
CO4	3	3	3	2	2	3
CO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	15	15	11	11	15

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**

HOD'S Signature

& Name

I M.Sc.,

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1IE1	DATA STRUCTURES	Lecture	5	3

COURSE DESCRIPTION

This course introduces Basic understanding of programming and foundational concepts in data structures.

COURSE OBJECTIVES

To become familiar with the various data structures and their applications and to increase the understanding of basic concepts of the design and use of algorithms.

UNITS

UNIT I: INTRODUCTION AND OVERVIEW (14Hrs)

Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures – Arrays: Definition – One Dimensional Array – Multidimensional Arrays: Two Dimensional Array – Sparse Matrices – Three dimensional and n-dimensional Arrays – Stacks : Introduction – Definition – Representation of Stack – Operations on Stack – Applications of Stacks: Evaluation of Arithmetic Expressions – **Implementation of Recursion - Tower of Hanoi Problem (Self study)**

UNIT II: QUEUES & LINKED LIST (14Hrs)

Introduction – Definition – Representation of Queues – **Various Queue Structures :** Circular Queue – Deque – Priority Queue – **Applications of Queues :** Simulation – CPU Scheduling in a Multiprogramming Environment – Round Robin Algorithm – **Linked Lists:** Single Linked List – Circular

Linked List – Double Linked List – Circular Double Linked List – **Applications of Linked List:** Polynomial Representation

UNIT III: TREES   (14Hrs)

Trees: Basic Terminologies – Representation of Binary Tree: Linear Representation – Linked Representation – Operations: Traversals – Types of Binary Trees: Expression Tree – Binary Search Tree – Splay tree.

UNIT IV: SORTING & SEARCHING   (14Hrs)

Sorting: Bubble Sort, Insertion Sort, Selection Sort, Shell Sort – Quick Sort - Merge Sort - Radix Sort - Heap Sort – **Searching:** Linear Search - Binary Search

UNIT V: GRAPHS   (14Hrs)

Graphs: Introduction – Graph representation and its operations – Path Matrix – Graph Traversal - Application of DFS – Shortest Path Algorithm -**Minimum Spanning Tree :** Prim"s Algorithm – Kruskal"sAlgorthim - Greedy – Knapsack – Back Tracking – 8 Queens **(Self Study)**

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

Real Time Applications using Data Structures

Recommended Text:

1. *Debasis Samantha (2013), Classic Data Structures, Second Edition, PHI Learning Private Limited.*

2. *P. Sudharsan, J. John Manoj Kumar, C & Data Structures, Third Edition, RBA Publications. Unit 4: Chapter 14, Unit 5: Chapter 13*

3. *Ellis Horowitz, SartajSahni, SanguthevarRajeshakaran, (2007), Fundamentals of Computer Algorithms, Second Edition, Universities Press (P) Limited*

Reference Books:

1. *Sara Baase, (1991), Computer Algorithms – Introduction to Design and Analysis, Addison- Wesley Publishing Company*

2. *Robert Kruse, C.L.Tondo, Bruce Leung, Data Structures and Program Design in C ,2nd Edition, PHI Publications"*

Digital Open Educational Resources (DOER) :

1. http://www.cs.sunysb.edu/~skiena/214/lectures/
2. http://datastructures.itgo.com/graphs/dfsbfs.htm
3. http://oopweb.com/Algorithms/Documents/PLDS210/VolumeFrames.html
4. http://discuss.codechef.com/questions/48877/data-structures-and-algorithms
5. http://code.tutsplus.com/tutorials/algorithms-and-data-structures--cms-20437

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION AND OVERVIEW**			
1.1	Definitions – Concept of Data Structures – Overview of Data Structures – Implementation of Data Structures –	5	Chalk & Talk	Black Board
1.2	Arrays: Definition – One Dimensional Array – Multidimensional Arrays: Two Dimensional Array – Sparse Matrices – Three dimensional and n-dimensional Arrays –	6	Chalk & Talk	LCD
1.3	Stacks : Introduction – Definition – Representation of Stack –	3	Discussion	Google Classroom
1.4	Operations on Stack –	3	Chalk &Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Applications of Stacks: Evaluation of Arithmetic Expressions – **Implementation of Recursion - Tower of Hanoi Problem**			
UNIT -2	**QUEUES AND LINKED LIST**			
2.1	Introduction – Definition – Representation of Queues – **Various Queue Structures :** Circular Queue – Deque – Priority Queue	6	Lecture	Green Board
2.2	**Applications of Queues :** Simulation – CPU Scheduling in a Multiprogramming Environment – Round Robin Algorithm	5	Chalk &Talk	Green Board
2.3	**Linked Lists:** Single Linked List – Circular Linked List – Double Linked List – Circular Double Linked List	3	Discussion	Google Classroom
2.4	**Applications of Linked List:** Polynomial Representation	5	Chalk &Talk	Green Board
UNIT -3	**TREES**			
3.1	Trees: Basic Terminologies Representation of Binary Tree:	4	Chalk & Talk	Black Board
3.2	Linear Representation of Trees	5	Chalk & Talk	LCD
3.3	Linked Representation – Operations: Traversals –	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.4	Types of Binary Trees: Expression Tree – Binary Search Tree – Splay tree	3	Lecture	Green Board
UNIT -4 SEARCHING AND SORTING				
4.1	**Sorting:** Bubble Sort, Insertion Sort, Selection Sort, Shell Sort, Quick Sort	3	Chalk & Talk	Black Board
4.2	Merge Sort - Radix Sort - Heap Sort –	6	Lecture	Green Board
4.3	**Searching:** Linear Search - Binary Search	3	Chalk & Talk	LCD
UNIT -5 GRAPHS				
5.1	**Graphs:** Introduction – Graph representation and its operations – Path Matrix – Graph Traversal - Application of DFS	6	Chalk & Talk	Black Board
5.2	**Minimum Spanning Tree :** Shortest Path Algorithm - Prim‟s Algorithm – Kruskal‟sAlgorthim – Greedy –	4	Discussion	Google Classroom
5.3	Knapsack – Back Tracking – 8 Queens **(Self Study)**			
UNIT -6 DYNAMISM				
6.1	Real Time Applications using Data Structures.	5	Assignments	Google class room

- **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
CO 1	Outline the basic data structures
CO 2	Identify the different operations and memory representations
CO 3	Interpret different techniques with their complexities
CO 4	Compare the applications of various data structures
CO 5	Choose an algorithm to solve simple problems suited for appropriate situations

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	2	2	1	2
CO2	3	2	2	2	2	3
CO3	3	2	3	3	3	2

CO4	3	3	2	3	3	3
CO5	3	3	3	3	3	2
Weightage of course contribute to each PSO	15	11	12	13	12	14

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**

HOD'S Signature& Name

I M.Sc.,

SEMESTER –I

<div style="border: 2px solid green; color: green;">

Skill Development 100%

</div>

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1IE2	NATURAL LANGUAGE PROCESSING	Lecture	5	3

COURSE DESCRIPTION

This course introduces the basic understanding of of natural language and linguistics

COURSE OBJECTIVES

To learn the fundamentals of natural language processing and to understand the role of CFG, semantics of sentences and pragmatics.

UNITS

UNIT I: INTRODUCTION   (14Hrs)

Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM - Regular Expressions, Finite-State Automata – English Morphology, Transducers for lexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, **Minimum Edit Distance (Self study)**

UNIT II: WORD LEVEL ANALYSIS   (14Hrs)

Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rulebased, Stochastic and Transformation-based tagging, Issues in PoS tagging – Hidden Markov and Maximum Entropy models

UNIT III: SYNTACTIC ANALYSIS   (14Hrs)

Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing – Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs - Feature structures, Unification of feature structures.

UNIT   IV: SEMANTICS AND PRAGMATICS   (14Hrs)

Requirements for representation, FirstOrder Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selection restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods

UNIT V: DISCOURSE ANALYSIS AND LEXICAL RESOURCES   (14Hrs)

Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC) **(Self Study)**

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

To perform the large scale analysis and Stream line process

Recommended Text:

1. *Daniel Jurafsky, James H. Martin;Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech; Pearson Publication; 2014.*

2. *Steven Bird, Ewan Klein and Edward Loper, ―Natural Language Processing with Python , First Edition, OReilly Media, 2009.*

Reference Books:

1. *Breck Baldwin, ―Language Processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015.*

2. *Richard M Reese, —Natural Language Processing with Java ,O_Reilly Media, 2015.*

3. *NitinIndurkhya and Fred J. Damerau, —Handbook of Natural Language Processing, Second Edition, Chapman and Hall/CRC Press, 2010.*

4. *TanveerSiddiqui, U.S. Tiwary, —Natural LanguageProcessing and Information Retrieval, Oxford University Press, 2008.*

Digital Open Educational Resources (DOER) :

1. http://www.cse.iitb.ac.in/~pb/papers/nlp-iitb.pdf
2. https://www.nitk.ac.in/faculty/dr-sarika-jain
3. https://www.simplilearn.com/tutorials/artificial-intelligence-tutorial/what-is-natural-language-processing-nlp
4. https://www.sas.com/en_us/insights/analytics/what-is-natural-language-processing-nlp.html
5. https://towardsdatascience.com/your-guide-to-natural-language-processing-nlp-48ea2511f6e1

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	Origins and challenges of NLP – Language Modeling: Grammar-based LM	5	Chalk & Talk	Black Board
1.2	Statistical LM - Regular Expressions, Finite-State Automata	6	Chalk & Talk	LCD
1.3	English Morphology, Transducers for lexicon and rules, Tokenization	3	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.4	Detecting and Correcting Spelling Errors, **Minimum Edit Distance**	3	Chalk & Talk	LCD
UNIT -2	**WORD LEVEL ANALYSIS**			
2.1	Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes,	6	Lecture	Green Board
2.2	Part-of-SpeechTagging, Rulebased, Stochastic and Transformation-based tagging, Issues in PoS tagging	5	Chalk &Talk	Green Board
2.3	Hidden Markov and Maximum Entropy models	3	Discussion	Google Classroom
UNIT -3	**SYNTACTIC ANALYSIS**			
3.1	Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar	4	Chalk & Talk	Black Board
3.2	Dependency Grammar Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing –-	5	Chalk & Talk	LCD
3.3	Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs	3	Chalk & Talk	Black Board
3.4	Feature structures, Unification of feature structures.	3	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -4	**SEMANTICS AND PRAGMANTICS**			
4.1	Requirements for representation, FirstOrder Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments.	3	Chalk & Talk	Black Board
4.2	Word Senses, Relations between Senses, Thematic Roles, selection restrictions – Word Sense Disambiguation, WSD using Supervised, Dictionary & Thesaurus.	6	Lecture	Green Board
4.3	Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.	3	Chalk & Talk	LCD
UNIT -5	**DISCOURSE ANALYSIS AND LEXICAL RESOURCES**			
5.1	Discourse segmentation, Coherence – Reference Phenomena	5	Chalk & Talk	Black Board
5.2	Anaphora Resolution using Hobbs and Centering Algorithm – Coreference	5	Discussion	Google Classroom
5.3	Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill's Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC)	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -6 DYNAMISM				
6.1	To perform the large scale analysis and Stream line process.	5	Assignments	Google class room

- **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:

S.NO.	COURSE OUTCOMES
CO 1	Describe the concepts of morphology, syntax, semantics, discourse & pragmatics of natural language
CO 2	Identify various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parsing and semantic analysis
CO 3	Classify the text into an organized group using a set of handicraft linguistic rules with appropriate NLP processes and algorithms

S.NO.	COURSE OUTCOMES
CO 4	Analyze the system with various language analysis methods and interpret the results
CO 5	Assess NLP systems, identify and suggest solutions for the shortcomings

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	2	2	2
CO2	3	2	2	2	2	2
CO3	3	2	2	3	2	3
CO4	3	2	2	3	2	3
CO5	3	2	2	3	3	3
Weightage of course contribute to each PSO	15	10	10	13	11	13

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**

HOD'S Signature& Name

CBCS Curriculum for M. Sc Information Technology

I M.Sc.,

SEMESTER –I

Skill Development 100%

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1IE3	OPERATING SYSTEMS	Lecture	5	3

COURSE DESCRIPTION

This course introduces the Basic understanding of working principles of computer and about hardware and software components.

COURSE OBJECTIVES

To develop fundamental knowledge of Operating systems, to become familiar with CPU Scheduling, memory and file management concepts, to learn concepts and programming techniques of Linux.

UNITS

UNIT I: INTRODUCTION   (14Hrs)

Evolution of Operating System - Structure - Processes - The Process Concepts - Inter Process Communication - IPC Problems - Scheduling Levels - PreemptiveVs Non- Preemptive Scheduling - **Scheduling Algorithms:** First Come First Served - Shortest Job First - Shortest Remaining Time Next - Three Level Scheduling - Round Robin Scheduling - Priority Scheduling - Multiple Queues - Shortest Process Next - Guaranteed Scheduling - Lottery Scheduling - Fair-Share Scheduling - **Thread Scheduling (Self study)**

UNIT II: MEMORY MANAGEMENT   (14Hrs)

Swapping - Virtual Memory - Page Replacement Algorithm - Segmentation

UNIT III: DEADLOCK   (14Hrs)

Deadlock - Examples of Deadlock - Detection - Recovery - Avoidance - Prevention – Semaphore -Shared Memory.

UNIT IV: FILE SYSTEM   (14Hrs)

File System - Files - Directories - I/O Management - Disks - Disk Arm Scheduling Algorithm.

UNIT V: LINUX   (14Hrs)

Introduction to Linux: Introducing Shell Programming - Linux File Systems - Linux File system calls - Implementation of Linux File systems - Linux Commands - Directory Oriented Commands - File Oriented Commands - Communication Oriented Commands- General Purpose Commands **(Self Study)**

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

Processing the operating systems with some real time applications

Recommended Text:

1. *Andrew S. Tanenbaum, (2001), Modern Operating Systems, 2nd Edition, Prentice Hall of India.*

2. *B.Mohamed Ibrahim, (2005) Linux Practical Approach, Firewall Media.*

Reference Books:

1. *Silberchatz, Galvin, Gagne, (2003), Operating Systems Concepts, 6th Edition Wiley India Edition.*

2. *JhonGoerzen, (2002), Linux Programming Bible, 4th Edition, Wiley-dreamtech India (P) Ltd.*

Digital Open Educational Resources (DOER) :

1. https://www.webopedia.com/TERM/O/operating_system.html
2. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
3. http://iips.icci.edu.iq/images/exam/Abraham-Silberschatz-Operating-System-Concepts--- 9th2012.12.pdf

4. htt ps://www.informatics.indiana.edu/rocha/academics/i101/pdfs/os
   _intro.pdf

5. htt ps://www.youtube.com/watch?v=oJMYYMIGVMU

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	Evolution of Operating System - Structure - Processes - The Process Concepts - Inter Process Communication	5	Chalk & Talk	Black Board
1.2	IPC Problems - Scheduling Levels - PreemptiveVs Non-Preemptive Scheduling	6	Chalk & Talk	LCD
1.3	Scheduling Algorithms:First Come First Served - Shortest Job First - Shortest Remaining Time Next	3	Discussion	Google Classroom
1.4	Three Level Scheduling - Round Robin Scheduling - Priority Scheduling -Multiple Queues - Shortest Process Next - Guaranteed Scheduling - Lottery Scheduling - Fair-Share Scheduling - **Thread Scheduling**	3	Chalk & Talk	LCD
UNIT -2	**MEMORY MANAGEMENT**			
2.1	Swapping - Virtual Memory	6	Lecture	Green Board
2.2	Page Replacement Algorithm -	5	Chalk &Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.3	Segmentation	3	Discussion	Google Classroom
UNIT -3	**DEADLOCK**			
3.1	**Deadlock** & Examples of Deadlock	4	Chalk & Talk	Black Board
3.2	Detection - Recovery	5	Chalk & Talk	LCD
3.3	Avoidance - Prevention	3	Chalk & Talk	Black Board
3.4	Semaphore -Shared Memory	3	Lecture	Green Board
UNIT -4	**FILE SYSTEM**			
4.1	**File System** - Files - Directories	3	Chalk & Talk	Black Board
4.2	I/O Management - Disks	6	Lecture	Green Board
4.3	Disk Arm Scheduling Algorithm	3	Chalk & Talk	LCD
UNIT -5 LINUX				
5.1	**Introduction to Linux:** Introducing Shell Programming - Linux File Systems - Linux File system calls	6	Chalk & Talk	Black Board
5.2	Implementation of Linux File systems - Linux Commands - Directory Oriented Commands - File Oriented Commands	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	Communication Oriented Commands- General Purpose Commands	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Processing the operating systems with some real time applications	5	Assignments	Google class room

COURSE OUTCOMES

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

NO.	COURSE OUTCOMES
CO 1	Outline the fundamental concepts of an OS and their respective functionality
CO 2	Demonstrate the importance of open-source operating system commands
CO 3	Identify and stimulate management activities of operating system
CO 4	Analyze the various services provided by the operating system
CO 5	Interpret different problems related to process, scheduling, deadlock, memory and files

Mapping of COs with PSOs

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

CLO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	12	11	13	12	12

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**

I M.Sc.,

SEMESTER –I

Skill Development 100%

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1IE4	HUMAN COMPUTER INTERACTION	Lecture	5	3

COURSE DESCRIPTION

This course introduces the basic understanding of the impact of human factors and Computer Science fundamentals.

COURSE OBJECTIVES

To think constructively and analytically in designing and evaluating interactive technologies.

UNITS

UNIT I: INTRODUCTION   (14Hrs)

Foundations: The Human: Introduction-Input-Output Channels- Memory. The Computer: Introduction- Text Entry Devices- Display Devices- Memory. The Interaction: Introduction – Models of Interaction-Frameworks and HCI Ergonomics-Interaction Styles-Elements of the WIMP Interface-Interactivity - **The Context of the Interactions (Self study)**

UNIT II: DESIGN PROCESS   (14Hrs)

Design Basics- Introduction - Process- User Focus-Scenarios- Navigation Design- Screen Design and Layout-Interaction and Prototyping. Design Rules-Introduction- Principles to Support Usability-Guidelines-Golden Rules and Heuristics-HCI Patterns

UNIT III: IMPLEMENTATION SUPPORT (14Hrs)

Introduction - Elements of Windowing Systems - Programming the Application- Using Toolkits-User Interface Management Systems. Evaluation Techniques: What is an Evaluation- Goal of Evaluation-Evaluation Through Expert Analysis-Choosing an Evaluation Method.

UNIT IV: UNIVERSAL DESIGN (14Hrs)

Introduction - Universal Design Principles-Designing for Diversity. User Support: Introduction-Requirements of User Support-Approaches to User Support-Adaptive Help Systems-Designing User Support Systems.

UNIT V: MODELS (14Hrs)

Cognitive Models: Introduction-Goals and Task-Linguistic Models- Challenge of Display Based System-Physical and Device Models - Cognitive Architectures**(Self Study)**

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

Identification of interaction tasks between Human and Computer System

Recommended Text:

1. *Alan dix, Janet finlay, Gregory D. Abowd and Russell Beale,(2004),Human Computer Interaction, 3rd edition, Pearson Education*

Reference Books:

1. *John C. Caroll, (2002), Human Computer Interaction in the new millennium, Pearson Education*
2. *Jenny Preece, Yvonne Rogers, Helen Sharp (2019), Interaction Design: Beyond Human–Computer Interaction,fifth edition, John Wiley & Sons Inc*

Digital Open Educational Resources (DOER) :

1. http://courses.iicm.tugraz.at/hci/
2. http://www.hcibook.com/hcibook/downloads/pdf/exercises.pdf
3. http://www.idemployee.id.tue.nl/g.w.m.rauterberg/lectures.html

4. http://user.medunigraz.at/andreas.holzinger/holzinger/papersen /HCI/Workshop/forISSEP%202005.pdf

5. http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/ (Unit IV: Universal DesignPrinciples)

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	Foundations: The Human: Introduction-Input-Output Channels- Memory.	5	Chalk & Talk	Black Board
1.2	The Computer: Introduction- Text Entry Devices- Display Devices- Memory.	6	Chalk & Talk	LCD
1.3	The Interaction: Introduction – Models of Interaction- Frameworks and HCI Ergonomics-	3	Discussion	Google Classroom
1.4	Interaction Styles-Elements of the WIMP Interface-Interactivity - **The Context of the Interactions**	3	Chalk & Talk	LCD
UNIT -2	**DESIGN PROCESS**			
2.1	Design Basics- Introduction - Process- User Focus-Scenarios- Navigation Design-Screen Design and Layout-Interaction and Prototyping. Design Rules	6	Lecture	Green Board
2.2	Introduction- Principles to	5	Chalk &Talk	Green

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Support Usability-Guidelines			Board
2.3	Golden Rules and Heuristics-HCI Patterns	3	Discussion	Google Classroom
UNIT -3 IMPLEMENTATION SUPPORT				
3.1	Introduction - Elements of Windowing Systems - Programming the Application	4	Chalk & Talk	Black Board
3.2	Using Toolkits-User Interface Management Systems.	5	Chalk & Talk	LCD
3.3	Evaluation Techniques: What is an Evaluation- Goal of Evaluation	3	Chalk & Talk	Black Board
3.4	Evaluation Through Expert Analysis-Choosing an Evaluation Method	3	Lecture	Green Board
UNIT -4 UNIVESAL DESIGN				
4.1	Introduction - Universal Design Principles-Designing for Diversity.	3	Chalk & Talk	Black Board
4.2	User Support: Introduction-Requirements of User Support-Approaches to User Support-	6	Lecture	Green Board
4.3	Adaptive Help Systems-Designing User Support Systems	3	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -5 MODELS				
5.1	Cognitive Models: Introduction-Goals and Task-Linguistic Models	6	Chalk & Talk	Black Board
5.2	Challenge of Display Based System-	4	Discussion	Google Classroom
5.3	Physical and Device Models – Cognitive Architectures	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Identification of interaction tasks between Human and Computer System.	5	Assignments	Google class room

End Semester - PG

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

- **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
CO 1	Describe typical human–computer interaction (HCI) models, styles, and various historic HCI paradigms
CO 2	Identify the usability and the beneficiary factors of User support systems
CO 3	Analyze the core theories, models and methodologies in the field of HCI
CO 4	Evaluate interactive systems based on the human factor theories
CO 5	Elaborate an interactive system based on the design principles, standards and guidelines

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	1	2	2	2
CO2	3	2	1	2	2	2
CO3	3	2	2	3	3	3
CO4	3	3	2	3	3	3
CO5	3	2	2	3	3	3
Weightage of course	15	11	8	13	13	13

contribute to each PSO					

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**

HOD'S Signature& Name

I M.Sc.,

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG1IAE	Image Editing and Animation	Practical	2	2

COURSE DESCRIPTION

This course content is enables other disciplined students to strengthen and increase the understanding of basis Image editingand Animation software like Photoshop and Alice3.

COURSE OBJECTIVES

The objective of this course is to provide the necessary knowledge and to impart, practical knowledge on various editing techniques in Photoshop and animation techniques in Alice3

UNITS

UNIT 1:PHOTOSHOPTOOLS   (6 HRS.)

Marquee Tool-Crop Tool-Lasso Tool-Move Tool, Rubber/clone Stamp tool-Eraser Tool-Paint Brush Tool-Art History/History Brush Tool-Text Tool.

UNIT II: TRANSFORMATION AND FILTERS   (6 HRS)

Resizing: Resizing an image- Resizing a canvas- Resizing a selection Rotating: Rotate 180 degrees and 90 degrees clockwise or counter clockwise- Rotate by degrees- Rotate a selection Sharpen Filters: Sharpen, Sharpen more, Blur Filters: Blur, Blur-more,Distort Filters: Pinch(Squeezing, bulging), Pixellate Filters: crystallize, Extracting an part of image from background image.

UNIT III: EXPLORING THE INTERFACE   (6 HRS)

Introduction to Alice - download and install Alice 3.1-A brief tour of the Alice 3 IDE -A brief tour of the Menu Bar- Set Preferences -Touring the Gallery- Adding an object to a scene- set object properties in the Scene editor- set special effects in a scene-Marking - position and resize an object in the Scene editor.

Unit IV:LEARNING TO PROGRAM THROUGH ALICE   (6 HRS)

Sequential & Parallel Execution - Do in order - Do together- Further nesting-Branching & Looping-Conditional execution-Relational Operators-Randomness-Repetition-While loops- Lists

Unit V: EVENT HANDLING & 3D ANIMATION   (6 HRS)

Interactive programming & event handling - Control of flow- Events- Event handing method - Create 3D Text- Billboards- Creating a Sound- Adding a Sound - Posting on YouTube.

PROGRAM LIST

1. Program for Creation of Image Web gallery

2. Program for Creation of Brochure

3. Program for Visiting card creation

4. Program for how to remove redeye & hotspot in the image

5. Program for Catalogue creation.

6. Alice Interface

7. Alice Objects

8. Alice Scene

9. Sequential and Parallel Execution

10.   Branching and Looping

11.   Event Handling

12.   Methods

13.   3D text

REFERENCES:

1. Photoshop 7 Complete reference , ISBN 978-0072223118 - Greenberg – McGraw Hill Publications.

2. MichealKolling, "Introduction to Programming with Green foot.

OPEN EDUCATIONAL RESOURCES:

1. Photoshop Online Training

https://www.tutorialspoint.com/photoshop_online_training/index.asp

2. http://www.alice.org/3.1/materials_videos.php

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1	Program for Creation of Image Web gallery	6	Demonstration	Desktop PC
2	Program for Creation of Brochure	6	Demonstration	Desktop PC
3	Program for Visiting card creation	6	Demonstration	Desktop PC
4	Program for how to remove redeye & hotspot in the image	6	Demonstration	Desktop PC
5	Program for Catalogue creation.	6	Demonstration	Desktop PC
6	Alice Interface	6	Demonstration	Desktop PC

7	Alice Objects	6	Demonstration	Desktop PC
8	Alice Scene	6	Demonstration	Desktop PC
9	Sequential and Parallel Execution	6	Demonstration	Desktop PC
10	Branching and Looping	6	Demonstration	Desktop PC
11	Event Handling	6	Demonstration	Desktop PC
12	Methods	6	Demonstration	Desktop PC
13.	3D text	6	Demonstration	Desktop PC

- **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	Design and edit images using image-editing tool.	K2 & K3	PSO1& PSO2
CO 2	Apply layer features for creating images for web and print.	K2 & K3	PSO2 &PSO3
CO 3	Build program in Alice using looping and branching.	K2 & K3	PSO3 & PSO6
CO 4	Apply event handlers in alice.	K2 & K3	PSO1& PSO2
CO 5	Develop 3D animations.	K2 & K3	PSO7 & PSO8

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:

HOD'S Signature& Name

I M.Sc.,

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2I4	DATABASE SYSTEMS	Lecture	6	5

COURSE DESCRIPTION

Fundamental computer knowledge that includes the hardware and memory storage.

COURSE OBJECTIVES

To understand the basic DBMS models, architecture, query and to normalize the database. To Learn Transaction Processing, Recovery and Distributed Database.

UNITS

UNIT I: (14Hrs)

Introduction: Database System Applications-Purpose of Database Systems-ViewofData-Database Users and Administrators. **Relational Database**: Structure of Relational Databases-Databases Schema- Keys-Schema Diagrams-**Formal Relational Query Languages**: Relational Algebra-Tuple Relational Calculus

UNIT-II :Database Design : (14Hrs)

Overview of Design Process-The Entity Relationship Model-Constraints-Removing Redundant Attributes in Entity Sets-Entity-Relationship Diagrams- Reduction to Relational Schemas-Extended E-Rfeatures-Alternative Notations for Modeling Data**. Relational Database Design:** Features of Good Relational Design-Functional Dependency-**Normalization**: 1NF,2NF,3NF,BCNF,4NF,5NF- Functional Dependency Theory

UNIT II: FUNCTIONS AND FUNCTIONAL PROGRAMMING (14Hrs)

Mapping and set types.- Introduction - Calling functions - Creating functions - passing functions - Formal arguments - Variable - Length Arguments - Functional Programming - Variable Scope – Recursion

UNIT-III :(14Hrs)

Transaction Management: Transaction Concept-Simple Transaction Model-Storage Structure-TransactionAtomicityandDurability-TransactionIsolation-Serializability.**Concurrency Control:** Lock Based Protocols-Locks-Granting of Locks-Two Phase Locking Protocol-Time Stamp Based Protocol -**Recovery System:** Failure Classification-**Recovery and Atomicity**: Log Records-Database Modification-Concurrency Control and Recovery-Recovery Algorithm

UNIT-IV : Distributed Database: (14Hrs)

Homogeneous and Heterogeneous Databases-Distributed Data storage-DistributedTransactions-CommitProtocols-ConcurrencyControlinDistributedDatabases-Distributed Query Processing.Casestudy: Mongo DB

UNIT-V: SQL (14Hrs)

Table Fundamentals - Viewing Data - Inserting - Deleting - Updating - Modifying -Constraints-Functions -Grouping-Subqueries-Joins-Views.**PL/SQL**:Introduction-PL/SQLBlock-DataTypesAndVariables-ControlStructure-Cursors - PL/SQL Security - Locks. PL/SQL Database Objects: Exception Handling- Packages -Proceduresand Functions-DatabaseTriggers

Recommended Text:

1. AbrahamSilberchatz,HenryF.Korth,S.Sudarshan,DatabaseSystemsConcepts,SixthEdition,TataMcgrawHill.

2. IvanBayross,SQL,PL/SQLTheProgrammingLanguageofORACLE,Fourthedition,BPBPublications.UnitIV& V

Reference Books:

1. AtulKahate,IntroductiontoDatabaseManagementsystems,Pearsoneducation.

2. CarloZaniolo,StefanoCeri,ChristosFaloustsos,R.T.Snodgrass,V.S.Subrahmanian,(1997),AdvancedDatabaseSystems, Morgan Kaufman.

3. *GeorgeKoch,KelvinLoney,(2002),Oracle9i:TheCompleteReference,Oracle Press,TataMcGrawHillPublication.*

4. *RamezElmasri,ShamkantB.Navathe(2014),"DatabaseSystems",Sixthedi tion,PearsonEducation,NewDelhi*

Digital Open Educational Resources (DOER) :

1. *http://awtrey.com/tutorials/dbeweb/database.php*

http://www.slideshare.net/SalamaAlbusaidi/emerging-   database- technology-

multimedia- database.

3. *http://www.tutorialspoint.com/dbms/index.htm*

4. *http://www.tutorialspoint.com/plsql/index.htm*

5. *https://opentextbc.ca/dbdesign/chapter/chapter-11-functional- dependencies/(FunctionalDependencies)*

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No.of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DatabaseSystemApplications				
1.1	DatabaseSystemApplications-PurposeofDatabaseSystems-ViewofData-Database Users and Administrators.	4	Discussion	Black Board
1.2	**Relational Database**:Structure of Relational Databases-Databases Schema	3	Chalk & Talk	Black Board
1.3	Keys-Schema Diagrams-**Formal Relational Query Languages**: RelationalAlgebra-	4	Lecture	LCD
1.4	TupleRelational Calculus	4	Discussion	Google classroo m

Module No.	Topic	No.of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -2 DatabaseDesign:				
2.1	**DatabaseDesign:**OverviewofDesignProcess-TheEntity RelationshipModel-Constraints-RemovingRedundantAttributesinEntitySets-Entity	5	Lecture	PPT & White board
2.2	RelationshipDiagrams-ReductiontoRelationalSchemas-ExtendedE-Rfeatures-AlternativeNotationsforModelingData.**RelationalDatabaseDesign:**FeaturesofGoodRelationalDesign-FunctionalDependency-	5	Chalk & Talk	Green Board
2.3	**Normalization**:1NF,2NF,3NF,BCNF, 4NF,5N-FunctionalDependencyTheory	5	Chalk & Talk	Black Board
UNIT – 3 Transaction Management:				
3.1	**Transaction Management:** Transaction Concept-Simple Transaction Model	4	Discussion	PPT & White board
3.2	-Storage Structure-TransactionAtomicityandDurability-TransactionIsolation-Serializability.	4	Chalk &Talk	Green Board
3.3	**ConcurrencyControl:** Lock Based Protocols-Locks-Granting of Locks-Two Phase Locking Protocol-TimeStamp Based Protocol	4	Chalk & Talk	Black Board
3.4	**Recovery System:** Failure	3	Chalk	Black

Module No.	Topic	No.of Lectures	Teaching Pedagogy	Teaching Aids
	Classification-**Recovery and Atomicity**: LogRecords-Database Modification-ConcurrencyControland Recovery-RecoveryAlgorithm		&Talk	Board
UNIT – 4Distributed Database:				
4.1	**Distributed Database:** Homogeneous and Heterogeneous Databases	3	Discussion	PPT &White board
4.2	Distributed Data storage-DistributedTransactions-	3	Chalk & Talk	Green Board
4.3	CommitProtocols-ConcurrencyControlinDistributedDatabases-	3	Chalk & Talk	Black Board
4.4	Distributed QueryProcessing.	3	Chalk & Talk	Black Board
4.5	Casestudy: MongoDB	3	Discussion	Black Board
UNIT – 5 SQL				
5.1	**SQL** - Table Fundamentals - Viewing Data - Inserting - Deleting - Updating -	3	Lecture	PPT & White board
5.2	Modifying -Constraints-Functions - Grouping-Subqueries-Joins-Views.	3	Chalk & Talk	Black Board
5.3	**PL/SQL**:Introduction-PL/SQLBlock-DataTypesAndVariables-ControlStructure-	3	Lecture	Black Board
5.4	Cursors - PL/SQL Security - Locks. PL/SQL Database Objects:	3	Chalk & Talk	Black Board

Module No.	Topic	No.of Lectures	Teaching Pedagogy	Teaching Aids
	Exception Handling-			
5.5	Packages –Proceduresand Functions-DatabaseTriggers	3	Chalk &Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Advanced Concepts	2	Discussion	Black Board

- **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	Explaintherelationaldatabases andusesofPL/SQL	K1	PSO3
CO 2	ApplySchema,ER-Model,normalization,transaction,concurrency,andrecoveryon tables usingSQLand PL/SQL.	K1, K2	PSO3
CO 3	Analyze and manage Concurrencycontrol andquerylanguages	K1 & K3	PSO3
CO 4	Assessdatabasesbasedonmodelsand Normal Forms.	K1, K2, K3	PSO6
CO 5	Designandconstructtablesand manipulateiteffectivelyusingPL/SQLdatabaseobjects	K1 & K3	PSO6

Mapping of C0s with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	3	2
CO3	3	2	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	13	15	15	13	15

Mapping of COs with POs

CO/	PO1	PO2	PO3	PO4

PSO				
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**

CBCS Curriculum for M. Sc Information Technology

I M.Sc.,

SEMESTER –II

For those who joined in 2023 or

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2I5	RDBMS LAB	Practical	6	5

COURSE DESCRIPTION

Basic understanding of SQL queries

COURSE OBJECTIVES

The primary Course Objective of this paper is to learn and implement SQL & PL/SQL.

UNITS - List of Programs

1. DDLCommands
2. DMLCommands
3. DCLCommands
4. UsageofSubQueriesinDMLand Create-SQL
5. Solvingqueriesusingbuilt-in functions
6. SimpleprogramsinPL/SQLblock
7. ExceptionHandlinginPL/SQL
8. ProgramsusingImplicitCursors
9. ProgramsusingExplicitCursors
10. Procedures &User-definedfunctions
11. CreationofTriggers

Recommended Text:

Ivan Bayross, SQL, PL/SQL The Programming Language of ORACLE, Fourth edition, BPB Publications

Reference Books:

RamezElmasri, Shamkant B. Navathe (2014), "Database Systems", Sixth edition, Pearson Education, New Delhi

Digital Open Educational Resources (DOER) :

1. *http://awtrey.com/tutorials/dbeweb/database.php*
2. *http://www.slideshare.net/SalamaAlbusaidi/emerging-database-technology-*
   multimedia- *database.*
3. *http://www.tutorialspoint.com/dbms/index.htm*
4. *http://www.tutorialspoint.com/plsql/index.htm*

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1	DDLCommands	6	Demonstration	Desktop PC
2	DMLCommands.	6	Demonstration	Desktop PC
3	DCLCommands	6	Demonstration	Desktop PC
4	UsageofSub QueriesinDMLand Create-SQL	6	Demonstration	Desktop PC
5	Solvingqueries usingbuilt-in functions	6	Demonstration	Desktop PC

6	SimpleprogramsinPL/SQLblock	6	Demonstration	Desktop PC
7	ExceptionHandlinginPL/SQL	6	Demonstration	Desktop PC
8	ProgramsusingImplicitCursors	6	Demonstration	Desktop PC
9	ProgramsusingExplicitCursors	6	Demonstration	Desktop PC
10	Procedures &User-definedfunctions	6	Demonstration	Desktop PC
11	CreationofTriggers	6	Demonstration	Desktop PC

- **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
CO 1	Understandthesignificanceofcontrolstatements,loopsandfunctionsin creatingsimpleprograms.
CO 2	Applythecoredatastructures available inSQLtostore,processandsortthe data
CO 3	Analyzethe realtimeproblemusingsuitableSQL concepts
CO 4	AssessthecomplexproblemsusingappropriateconceptsinSQL
CO 5	Developtherealtimeapplicationsusingprogramminglanguage.

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	2	2
CO2	3	3	3	3	3	2
CO3	3	2	3	3	3	3
CO4	3	3	3	3	3	3
CO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	13	15	15	13	15

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**

I M.Sc.,

SEMESTER –II

Employability 100%

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2I6	OPEN SOURCE TECHNOLOGIES	Practical	6	4

COURSE DESCRIPTION

Basic understanding of computer programming, Internet and HTML/XHTML

COURSE OBJECTIVES

To learn the efficiency of Open Source Technology and to train to have agoodpracticalknowledgeofhowtowritesuccessfulPHPandRubycodeandutil izingadatabaseusingPHP.

UNIT I: PHP (14Hrs)

PHP: Introduction – Creating a PHP page– Running PHP page –HTML and PHP – Printing Text – Comment Statements – Working with variables – Storing data in variables – Interpolating strings – Constants - Understanding Internal Data types – Operators – Flow Control – Strings: String Functions - Converting to and from strings -Formatting text strings - Working with numbers.

UNIT II: Date and Time (14Hrs)

DateandTime-CreateanArray-UseanAssociativeArray- FunctionstoWorkwithArrays-Workwith Arrays of Arrays-Create and Use Functions

UNIT III: Reading Data in web pages (14Hrs)

Reading Data in web pages: Handling various controls - PHP Browser-Handling power: Data Validation - File Handling : Opening a file – Reading Text from a file – Closing a file- Working with Databases: Creating ,

Inserting , Accessing , Updating , Deleting and Sorting Database - Work with Cookies and Sessions

UNIT IV: Ruby   (14Hrs)

Ruby: Getting Started with Ruby – Working with Numbers and Strings – Variables – Constants– Operators – Conditionals and Loops

UNIT V: Classes and Objects   (14Hrs)

Arrays - Hashes - Methods - Blocks : Classes and Objects : Creating a Class and an Object- Exception Handling – File Handling

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

Current trends in implementation of OPEN SOURCE tools

Recommended Text:

1.Steven Holzner, (2016), "PHP: The Complete Reference", McGraw Hill Education Private Limited, Indian Edition. (Unit I, II)

2.RachnaKapur, Mario Briggs, Tapas Saha, Ulisses Costa, Pedro Carvalho, Raul F. Chong, Peter Kohlmann (2010), "Getting Started with Open Source Development", DB2 on Campus Book Series. (Unit III)

3.http://indexof.es/Ruby/Beginning%20Ruby%20On%20Rails.pdf (Unit IV)

4.http://www.cs.uni.edu/~wallingf/teaching/agile-may2010/ruby/programming-ruby.pdf(Unit V)

Reference Books:

1.W. Jason Gilmore (2010), "Beginning PHP &MySql", Apress.

2.JoelMurach, Ray Harris (2010), "PHP and MySQL",Shroff Publishers & Distributors

3.Larry Ullman (2008), "PHP 6 and MySQL 5", Pearson Education.

4.JohnCoggeshall (2006), "PHP 5", Pearson Education.

5.Michale C. Glass (2004), "Beginning PHP, Apache, MySQL Web Development", Wiley DreamTech Press.

Digital Open Educational Resources (DOER) :

1. http://www.w3schools.com/php/

2.http://howtostartprogramming.com/PHP/

3.http://www.massey.ac.nz/~nhreyes/MASSEY/159339/Lectures/Lecture%2011%20-

%20PHP%20-%20Part%205%20-%20CookiesSessions.pdf

4.http://www.tutorialspoint.com/mysql/

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**Introduction**			
1.1	Introduction – Creating a PHP page– Running PHP page – HTML and PHP – PrintingText – Comment Statements	5	Chalk & Talk	Black Board
1.2	Working with variables – Storing data in variables - Interpolatingstrings – Constants - Understanding Internal Datatypes – Operators – Flow Control –	6	Chalk & Talk	LCD
1.3	– Strings:String Functions - Converting to and from strings -Formatting text strings -	3	Discussion	Google Classroom
1.4	Working withnumbers.	3	Chalk & Talk	LCD
UNIT -2	**Array**			
2.1	DateandTime-CreateanArray-UseanAssociativeArray	6	Lecture	Green Board
2.2	-FunctionstoWorkwithArrays-	5	Chalk &Talk	Green Board
2.3	Workwith Arrays of Arrays-	3	Discussion	Google

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	CreateandUseFunctions			Classroom
UNIT -3	**Reading Data in web pages**			
3.1	Reading Data in web pages: Handling various controls -	4	Chalk & Talk	Black Board
3.2	PHP Browser-Handling power: Data Validation -	5	Chalk & Talk	LCD
3.3	File Handling : Opening a file – Reading Text from a file – Closing a file-	3	Chalk & Talk	Black Board
3.4	Working with Databases: Creating , Inserting , Accessing , Updating , Deleting and Sorting Database - Work with Cookies and Sessions	3	Lecture	Green Board
UNIT -4 Ruby				
4.1	Ruby: Getting Started with Ruby –	3	Chalk & Talk	Black Board
4.2	Working with Numbers and Strings – Variables –	6	Lecture	Green Board
4.3	Constants– Operators – Conditionals and Loops	3	Chalk & Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -5 Classes and Objects				
5.1	Classes and Objects : Creating a Class and an Object	6	Chalk & Talk	Black Board
5.2	Exception Handling – File Handling	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	Current trends in implementation of open source tools	5	Assignments	Google class room

EVALUATION PATTERN

- **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
CO 1	Demonstratethesetupandconfigurationofdevelopmentenvironmenttowrite PHP and RubyScripts
CO 2	Selecttheappropriatelanguagefundamentalsandtechniquestowriteand compilePHP and Rubyprograms
CO 3	Examinethebugsandanalyzehowtoprevent and removethebugs
CO 4	Testanddebugtheapplicationwithsampleinputstocheckthecorrectnessandconsistencyof thescripts
CO 5	CreatesimpleprogramsthatmakeuseofvariousPHPandRubyfeaturesand functionsandsolvewebapplicationanddatabasetasksusingPHP

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CLO1	3	3	3	3	2	2
CLO2	3	3	3	3	3	2
CLO3	3	2	3	3	3	3
CLO4	3	3	3	3	3	3
CLO5	3	3	3	3	3	3
Weightage of course contribute to each PSO	15	13	15	15	13	15

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**

HOD'S Signature

& Name

I M.Sc.,

SEMESTER –II

<div style="border: 2px solid green;">

Skill Development 100%

</div>

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2IE5	NETWORK SECURITY	Lecture	4	3

COURSE DESCRIPTION

Basic knowledge about computer networks

COURSE OBJECTIVES

To understand the importance of networking and the basic model followed in network design and to understand necessary approaches and techniques to build protection mechanisms in order to secure computer networks

UNITS

UNIT I: Introduction   (14Hrs)

Uses of Computer Networks – Network Hardware – Line Configuration – Topology – Transmission Modes – Reference Models: OSI Reference Model – TCP/IP Reference Model – Physical Layer: Guided Transmission Media – Wireless Transmission – Communication Satellites – Public Switched Telephone Network: Local Loop – Multiplexing – Switching

UNIT II: Design Issues   (14Hrs)

Data Link Layer: Design Issues - Error Detection and Correction - Network Layer : Design Issues – Routing Algorithms : Shortest Path Routing – Distance Vector Routing – Link State Routing – Broadcast Routing – Multicast Routing – Congestion Control

UNIT III: Layers   (14Hrs)

Network Layer in the Internet: IP Addresses –Transport Layer: Elements of Transport Protocols: Addressing – Connection Establishment – Connection

Release – Application Layer: Domain Name System – Email: Architecture and Services

UNIT IV: Network Security: **(14Hrs)**

Introduction to Cryptography - Symmetric - Key Cryptography - Asymmetric- key Cryptography – Security Services: Message Confidentiality - Message Integrity - Message Authentication - Digital Signature - Entity Authentication – Security in the Internet: IPSecurity - SSL/TLS: SSL services - SSL Protocols - Firewalls

UNIT V: Security **(14Hrs)**

Security for Wireless Networks: Introduction – Protecting the wireless networks – Physical Security – Authentication and access control- Smartphone Security: Security Threats - Steps to smartphone security – Websites and Web application Security: Definition – Available Technologies - Threats - Strategies.

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

To study recent Wi -Fi and Smartphone technologies

Recommended Text:

1.AndrewS.Tanenbaum, David J. Wetherall (2010), Computer Networks, Prentice Hall of India, V Edition. (Unit I - Unit - III) Unit I – Chapter 1,2

Unit II – Chapter 3,5

Unit III – Chapter 5,6,7

2.Behrouz A. Forouzan, (2016), Data Communications and Networking, Tata McGraw-Hill Publishing Company Limited, IV Edition. (Unit IV) Unit IV - Chapter 30, 31, 32

Reference Books:

1.Charles P. Pfleeger, Shari Lawrence Pfleeger(2002), Security in Computing, 3rd Edition, Pearson Education.

2.James F. Kurose, Keith W. Ross (2005),Computer Networking, 3rd Edition, Addison Wesley,.

3.William Stallings(2006), Cryptography and Network Security: Principles and Practice, 3rd Edition, PHI.

Digital Open Educational Resources (DOER) :

1.http://wndw.net/pdf/wndw3-en/ch09-security-for-wireless-networks.pdf

(Unit V- Wireless Networks Security)

2.https://www.fcc.gov/sites/default/files/smartphone_master_document.pdf

(Unit V- Steps to smartphone security)

3.https://www.csoonline.com/article/3241727/mobile-security/6-mobile-

security-threats-you- should-take-seriously-in-2019.html

(Unit V – SmartPhone Security Threats)

4.https://kgk.uni-obuda.hu/sites/default/files/12_Kadena.pdf (Unit V – SmartPhone Security Threats)

5.https://www.goodfirms.co/glossary/web-security/ (Unit V – Web Security)

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**Introduction and overview**			
1.1	Uses of Computer Networks – Network Hardware – Line Configuration –	5	Chalk & Talk	Black Board
1.2	Topology – Transmission Modes – Reference Models: OSI Reference Model –	6	Chalk & Talk	LCD
1.3	TCP/IP Reference Model – Physical Layer: Guided Transmission Media – Wireless Transmission –	3	Discussion	Google Classroom
1.4	Communication Satellites –	3	Chalk &Talk	LCD

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Public Switched Telephone Network: Local Loop – Multiplexing – Switching			
UNIT -2	**Design Issues**			
2.1	Data Link Layer: Design Issues - Error Detection and Correction -	6	Lecture	Green Board
2.2	Network Layer : Design Issues – Routing Algorithms : Shortest Path Routing –	5	Chalk &Talk	Green Board
2.3	Distance Vector Routing – Link State Routing –	3	Discussion	Google Classroom
2.4	Broadcast Routing – Multicast Routing – Congestion Control	5	Chalk &Talk	Green Board
UNIT -3	**Layers**			
3.1	Network Layer in the Internet: IP Addresses –	4	Chalk & Talk	Black Board
3.2	Transport Layer: Elements of Transport Protocols: Addressing – Connection Establishment –	5	Chalk & Talk	LCD
3.3	Connection Release –	3	Chalk &Talk	Black

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Application Layer: Domain Name System –			Board
3.4	Email: Architecture and Services	3	Lecture	Green Board
UNIT -4 Network Security:				
4.1	Network Security: Introduction to Cryptography -	3	Chalk & Talk	Black Board
4.2	Symmetric - Key Cryptography - Asymmetric- key Cryptography – Security Services: Message Confidentiality -	6	Lecture	Green Board
4.3	Message Integrity - Message Authentication - Digital Signature - Entity Authentication – Security in the Internet: IPSecurity - SSL/TLS: SSL services - SSL Protocols - Firewalls	3	Chalk & Talk	LCD
UNIT -5 Security				
5.1	Security for Wireless Networks: Introduction –	6	Chalk & Talk	Black Board
5.2	Protecting the wireless networks – Physical Security –	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Authentication and access control-			
5.3	Smartphone Security: Security Threats - Steps to smartphone security –Websites and Web application Security: Definition – Available Technologies - Threats - Strategies.	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	To study recent Wi -Fi and Smartphone technologies	5	Assignments	Google class room

- **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
CO 1	Outline the basic data structures
CO 2	Identify the different operations and memory representations
CO 3	Interpret different techniques with their complexities
CO 4	Compare the applications of various data structures
CO 5	Choose an algorithm to solve simple problems suited for appropriate situations

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	2	2	1	2
CO2	3	2	2	2	2	3
CO3	3	2	3	3	3	2
CO4	3	3	2	3	3	3
CO5	3	3	3	3	3	2
Weightage of course contribute to each PSO	15	11	12	13	12	14

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**

HOD'S Signature& Name

I M.Sc.,

SEMESTER –II

For those who joined in 2023 onwards

Skill Development 100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2IE6	BIOMETRIC TECHNIQUES	Theory	4	3

COURSE DESCRIPTION

This course introduces the Basic knowledge of computer vision and cyber security concepts

COURSE OBJECTIVES

To understand various physiological and behavioural biometrics and its applications.

UNITS

UNIT I: INTRODUCTION (14Hrs)

Introduction: Biometric Fundamentals - Biometrics Vs Traditional Techniques - Benefits of Biometrics in Identification Systems - Key Biometric Terms and Processes: Verification, Identification and Biometric Matching - Accuracy in Biometric Systems: False Match Rate, False Non-Match Rate, Failure to Enroll Rate, **Derived Metrics (Self Study)**

UNIT II: PHYSIOLOGICAL BIOMETRICS (14Hrs)

Finger Scan: Components-How it works-Competing Technologies-Deployments-Strengths and Weaknesses. Facial Scan: Components- How it Works-Competing Technologies-Deployments-Strengths and Weaknesses

UNIT III: OTHER PHYSIOLOGICAL BIOMETRICS (14Hrs)

Iris Scan: Components- How it Works-Competing Technologies-Deployments-Strengths and Weaknesses. Voice Scan: How it Works-Competing Technologies-Deployments-Strengths and Weaknesses. Other Physiological Biometrics: Hand Scan and Retina Scan.

UNIT IV: BEHAVIOURAL BIOMETRICS (14Hrs)

Signature Scan and Keystroke Scan: How it Works-Competing Technologies-Deployments-Strengths and Weaknesses. Esoteric Biometrics: Vein Pattern-Facial Thermography-DNA- Sweat Pores- Hand Grip- Finger Nail Bed- Body Odor- Ear-Gait- Skin Luminescence- Brain Wave Pattern- Foot Print and Foot Dynamics

UNIT V: BIOMETRIC APPLICATIONS (14Hrs)

Categorizing Biometric Applications - Application Areas: Criminal and Citizen Identification, Surveillance, PC/Network Access, E-Commerce/Telephony and Retail/ATM - Costs to Deploy -Issues in Deployment- Biometric Standards

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

Security in identification access control and authentication

Recommended Text:

1. *Samir Nanavati, Michael Thieme, Raj Nanavati,(2003),Biometrics - Identity Verification in a Networked World, Wiley-dreamtech India Pvt Ltd, New Delhi*

2. *John D. Woodward, Nicholas M. Orlans, Peter T. Higgins, Biometrics: the ultimate reference, Dreamtech Press*

Reference Books:

1. *Anil K Jain, Patrick Flynn, Arun A Ross, (2008), Handbook of Biometrics, Springer*

Digital Open Educational Resources (DOER) :

1. http://www.sans.org/reading-room/whitepapers/authentication/biometric-scanning/
2. http://www.biometrics.gov/documents/biointro.pdf
3. http://www.cse.unr.edu/~bebis/CS790Q/Lect/IntroBiometrics.pdf
4. http://www.planetbiometrics.com/creo_files/upload/article-files/btamvol1 update.pdf

5. http://www.biometrics.gov/documents/biointro.pdf (Unit V: Biometric Applications)

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**INTRODUCTION**			
1.1	Introduction: Biometric Fundamentals - Biometrics Vs Traditional Techniques -	5	Chalk & Talk	Black Board
1.2	Benefits of Biometrics in Identification Systems - Key	6	Chalk & Talk	LCD
1.3	Biometric Terms and Processes: Verification, Identification and Biometric Matching - Accuracy in	5	Chalk & Talk	Black Board
1.4	Biometric Systems: False Match Rate, False Non-Match Rate, Failure to Enroll Rate, **Derived Metrics**	6	Chalk & Talk	LCD
UNIT -2	**PHYSIOLOGICAL BIOMETRICS**			
2.1	Finger Scan: Components-How it works-Competing Technologies- Deployments- Strengths and Weaknesses.	6	Lecture	Green Board
2.2	Facial Scan: Components- How it Works	5	Chalk &Talk	Green Board
2.3	Competing Technologies- Deployments-Strengths and Weaknesses	3	Discussion	Google Classroom
UNIT -3	**OTHER PHYSIOLOGICAL BIOMETRICS**			

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.1	Iris Scan: Components- How it Works-Competing Technologies.	4	Chalk & Talk	Black Board
3.2	Deployments-Strengths and Weaknesses	5	Chalk & Talk	LCD
3.3	Voice Scan: How it Works-Competing Technologies-Deployments-Strengths and Weaknesses	3	Chalk & Talk	Black Board
3.4	Other Physiological Biometrics: Hand Scan and Retina Scan	3	Lecture	Green Board
UNIT -4 BEHAVIOURAL BIOMETRICS				
4.1	Signature Scan and Keystroke Scan: How it Works-Competing Technologies-Deployments-Strengths and Weaknesses.	3	Chalk & Talk	Black Board
4.2	Esoteric Biometrics: Vein Pattern- Facial Thermography-DNA- Sweat Pores- Hand Grip-Finger Nail Bed- Body Odor-Ear-Gait-	6	Lecture	Green Board
4.3	Skin Luminescence- Brain Wave Pattern- Foot Print and Foot Dynamics	3	Chalk & Talk	LCD
UNIT -5 BIOMETRIC APPLICATIONS				
5.1	Categorizing Biometric Applications - Application Areas	6	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.2	Criminal and Citizen Identification, Surveillance, PC/Network Access,	4	Discussion	Google Classroom
5.3	E-Commerce/Telephony and Retail/ATM - Costs to Deploy - Issues in Deployment- Biometric Standards	6	Chalk & Talk	Black Board
UNIT -6 DYNAMISM				
6.1	Security in identification access control and authentication	5	Assignments	Google class room

- **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:

S.NO.	COURSE OUTCOMES
CO 1	Outline the existing theories, methods and interpretations in thefield of

S.NO.	COURSE OUTCOMES
	biometrics
CO 2	Identify the deployment areas, competing technologies, strength and weakness of various Physiological and Behavioral Biometrics
CO 3	Analyze various Application areas, Biometric security issues andBiometric standards
CO 4	Assess the methods relevant for design, development and operation of biometric access control systems
CO 5	Determine identification /verification systems to validate the user identity and technological uplifts in biometrics compared to traditional securing mechanisms

Mapping of COs with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	2	1	1	1	1	1
CO2	2	2	1	1	2	2
CO3	3	2	1	2	2	3
CO4	3	2	2	3	3	2
CO5	3	3	2	3	3	3
Weightage of course contribute to each PSO	13	10	7	10	11	11

Mapping of COs with POs

CO/ PSO	PO1	PO2	PO3	PO4

CBCS Curriculum for M. Sc Information Technology

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**

I M.Sc.,

SEMESTER –II

For those who joined in 2023 onwards

Employability 100%

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2IE7	OBJECT ORIENTED ANALYSIS AND DESIGN	Lecture	4	3

COURSE DESCRIPTION

This course introduces Basic understanding of one of the object-oriented programs

COURSE OBJECTIVES

The primary objective is to understand the principles & requirements and apply the UML (Unified Modeling Language) and tools for OOA and Design

UNIT I: OBJECT BASICS   (14Hrs)

Object- oriented Philosophy – Object – Object State, Behaviours and Methods. Encapsulation and Information Hiding – Class Hierarchy – Polymorphism, Aggregation, Object Containment, Meta Classes

UNIT II: OBJECT ORIENTED METHODOLOGIES   (14Hrs)

Object Oriented Methodologies: Rumbaugh Object Model, Booch Methodology- Jacobson Methodology, Patterns, Frameworks and Unified Approach..

UNIT III: OBJECT ORIENTED ANALYSIS   (14Hrs)

Business Object Analysis– Use Case Driven Approach – Use Case Model. Object Analysis – Noun Phrase Approach – CRC – Identifying Object Relationships and Methods.

UNIT IV: OBJECT ORIENTED DESIGN (14Hrs)

The Design Process – Design Axioms – Corollaries – Design Patterns – Designing Classes. Software Quality: Tests- Testing Strategies – Test Cases – Test Plan – Continuous Testing – Mier"s Debugging Principles.

UNIT V: UML AND PROGRAMMING (14Hrs)

Introduction – State and Dynamic Models – UML Diagrams – Class Diagrams – Use Case Diagrams- UML Dynamic Modeling

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

To study recent tools on analysis and design

Recommended Text:

1. *Ali Brahami, Object Oriented Systems Development, Tata-McGraw Hill, New Delhi*

Reference Books:

1. *Martin Fowler, Kendall Scott, UML Distilled- Applying the Standard Object Modeling Language, Addition Wesley.*
2. *Grady Booch, (1994), Object-oriented Analysis and Design with applications, 2nd Edition, Addition Wesley*

Digital Open Educational Resources (DOER) :

1. *http://www.slideshare.net/helghareeb/object-oriented-analysis-and-design-12164752*
2. *http://www.uml-diagrams.org/uml-object-oriented-concepts.html*
3. *http://www.tutorialspoint.com/object_oriented_analysis_design/index.htm*
4. *https://www.mppmu.mpg.de/english/kluth_oo_intro.pdf*
5. *http://www.agilemodeling.com/artifacts/useCaseDiagram.htm (Unit V: Use Case Diagrams)*

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**OBJECT BASICS**			
1.1	Object- oriented Philosophy – Object – Object State.	5	Chalk & Talk	Black Board
1.2	Behaviours and Methods. Encapsulation and Information Hiding – Class Hierarchy	6	Chalk & Talk	LCD
1.3	Polymorphism, Aggregation, Object Containment, Meta Classes	3	Discussion	Google Classroom
UNIT -2	**OBJECT ORIENTED METHODOLOGIES**			
2.1	Object Oriented Methodologies: Rumbaugh Object Model, Booch Methodology-	6	Lecture	Green Board
2.2	Jacobson Methodology, Patterns, Frameworks and Unified Approach..	6	Chalk &Talk	Green Board
UNIT -3	**OBJECT ORIENTED ANALYSIS**			
3.1	Business Object Analysis– Use Case Driven Approach –	4	Chalk & Talk	Black Board
3.2	Use Case Model.	5	Chalk & Talk	LCD
3.3	Object Analysis – Noun Phrase Approach – CRC	3	Chalk & Talk	Black Board
3.4	Identifying Object Relationships and Methods	3	Lecture	Green Board
UNIT -4 OBJECT ORIENTED DESIGN				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.1	The Design Process – Design Axioms – Corollaries – Design Patterns – Designing Classes.	3	Chalk & Talk	Black Board
4.2	Software Quality: Tests-Testing Strategies – Test Cases – Test Plan –	6	Lecture	Green Board
4.3	Continuous Testing – Mier"s Debugging Principles	3	Chalk & Talk	LCD
UNIT -5 UML AND PROGRAMMING				
5.1	Introduction – State and Dynamic Models –	6	Chalk & Talk	Black Board
5.2	UML Diagrams – Class Diagrams –	4	Discussion	Google Classroom
5.3	Use Case Diagrams- UML Dynamic Modeling	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	To study recent tools on analysis and design	5	Assignments	Google class room

- **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

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids

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:

CO's	Course Outcomes
CO1	Recognize the concepts and principles of object-oriented analysis, design and Testing
CO2	Demonstrate the importance of system development process using variousapproaches and choose the relevant technique for a system in each phases of SDLC
CO3	Differentiate various object-oriented analysis, design and testing methods and models.
CO4	Assess various analysis, design and testing strategies appropriate to build high-performance object-oriented system
CO5	Design Object oriented systems using object modelling techniques and analyze them for correctness and quality

Mapping of C0s with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	2	3	2	2
CO2	3	2	2	3	2	3
CO3	3	3	2	3	2	3
CO4	3	2	2	3	2	3
CO5	3	2	3	3	3	3
Weightage of						

course contribute to each PSO	15	11	11	15	11	14

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**

I M.Sc.,

SEMESTER –II

Employability 100%

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2IE8	SOFTWARE PROJECT MANAGEMENT	Lecture	4	3

COURSE DESCRIPTION

Basic knowledge about the fundamentals of software project development

COURSE OBJECTIVES

The primary objective is to define and highlight importance of software project management and to become familiarize in formulating software management metrics & strategy in managing projects

UNIT I: Introduction (14Hrs)

Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization

UNIT II: Domain Processes (14Hrs)

Managing Domain Processes - Project Selection Models - Project Portfolio Management - Financial Processes - Selecting a Project Team - Goal and Scope of the Software Project -Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS - Project Milestones - Work Packages - Building a WBS for Software.

UNIT III: Tasks and Activities (14Hrs)

Tasks and Activities - Software Size and Reuse Estimating - The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures - COCOMO: A

Regression Model - COCOMO II - SLIM: A Mathematical Model - Organizational Planning - Project Roles and Skills Needed.

UNIT IV: Resource Activities   (14Hrs)

Project Management Resource Activities - Organizational Form and Structure - Software Development Dependencies - Brainstorming - Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling

UNIT V: Quality: (14Hrs)

Quality: Requirements – The SEI CMM - Guidelines - Challenges - Quality Function Deployment - Building the Software Quality Assurance - Plan - Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software

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

To study recent tools on software project management tools

Recommended Text:

2. Robert T. Futrell, Donald F. Shafer, Linda I. Safer, "Quality Software Project Management", Pearson Education Asia 2002

Reference Books:

1.PankajJalote, "Software Project Management in Practice", Addison Wesley 2002.

2.Hughes, "Software Project Management", Tata McGraw Hill 2004, 3rd Edition.

Digital Open Educational Resources (DOER) :

1.https://highered.mheducation.com/sites/0077109899/information-center-view/

2.https://www.tutorialspoint.com/software_engineering/software_project_management.htm

3.https://www.smartsheet.com/content/software-project-management

4.https://www.philadelphia.edu.jo/academics/lalqoran/uploads/SPM_Chapter_1-%202016%204.ppt

5.https://cs.gmu.edu/~kdobolyi/cs421/projectmanagement.ppt

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1	**Introduction**			
1.1	Introduction to Competencies - Product Development Techniques - Management Skills - Product Development Life Cycle - Software Development Process and models - The SEI CMM - International Organization for Standardization.	5	Chalk & Talk	Black Board
1.2	Management Skills - Product Development Life Cycle	6	Chalk & Talk	LCD
1.3	- Software Development Process and models -	3	Discussion	Google Classroom
1.4	The SEI CMM - International Organization for Standardization.	3	Chalk & Talk	LCD
UNIT -2	**Domain Processes**			

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	Managing Domain Processes - Project Selection Models -	6	Lecture	Green Board
2.2	Project Portfolio Management - Financial Processes -	5	Chalk &Talk	Green Board
2.3	Selecting a Project Team - Goal and Scope of the Software Project -Project Planning - Creating the Work Breakdown Structure - Approaches to Building a WBS -	3	Discussion	Google Classroom
2.4	Project Milestones - Work Packages - Building a WBS for Software.	5	Chalk &Talk	Green Board
UNIT -3 Tasks and Activities :				
3.1	Tasks and Activities - Software Size and Reuse Estimating -	4	Chalk & Talk	Black Board
3.2	The SEI CMM - Problems and Risks - Cost Estimation - Effort Measures -	5	Chalk & Talk	LCD
3.3	COCOMO: A Regression Model - COCOMO II - SLIM: A Mathematical Model -	3	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.4	Organizational Planning - Project Roles and Skills Needed.	3	Lecture	Green Board
UNIT -4 Project Management Resource:				
4.1	Project Management Resource Activities -	3	Chalk & Talk	Black Board
4.2	Organizational Form and Structure - Software Development Dependencies - Brainstorming -	6	Lecture	Green Board
4.3	Scheduling Fundamentals - PERT and CPM - Leveling Resource Assignments - Map the Schedule to a Real Calendar - Critical Chain Scheduling	3	Chalk & Talk	LCD
UNIT -5Quality				
5.1	Quality: Requirements – The SEI CMM - Guidelines - Challenges	6	Chalk & Talk	Black Board
5.2	Quality Function Deployment - Building the Software Quality Assurance - Plan	4	Discussion	Google Classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.3	Software Configuration Management: Principles - Requirements - Planning and Organizing - Tools - Benefits - Legal Issues in Software -	4	Discussion	Google Classroom
UNIT -6 DYNAMISM				
6.1	To study recent tools on software project management tools	5	Assignments	Google class room

- **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:

CO's	Course Outcomes

CO's	Course Outcomes
CO1	Understanding of project management fundamentals such as project planning, risk management and quality assurance
CO2	Choose the appropriate scheduling and testing techniques to build a quality product
CO3	Apply different cost estimation techniques and quality measures for software development
CO4	Differentiate various software development models and methodologies, planning activities and scheduling methods
CO5	Asses the importance of software project documentation and identify the methods to create project documentation, including requirements documents, design documents, and project plans

Mapping of C0s with PSOs

CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	1	2	2	1	2
CO2	3	2	2	2	2	3
CO3	3	2	3	3	3	2
CO4	3	3	2	3	3	3
CO5	3	3	3	3	3	2
Weightage of course contribute to each PSO	15	11	12	13	12	14

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**

CBCS Curriculum for M. Sc Information Technology

I M.Sc.,

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	23PG2IAE	E-Commerce and Content Management Systems	Practical	3	2

COURSE DESCRIPTION

This is a Web scripting language PHP able tobuild dynamic Web applications. Semantics and syntax of the PHP language, including discussion on the practical problems that PHP solves.

COURSE OBJECTIVES

The objective of this course is to provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP.

UNITS

Unit 1: Introduction to E-Commerce (6 HRS)

Welcome to Electronic Commerce: Electronic commerce Framework – Electronic Commerce and Media Convergence – The Anatomy of E-commerce- Electronic Commerce Consumer Applications

Electronic Commerce and World Wide Web: Architectural Framework for Electronic Commerce – World Wide Web as the Architecture – Web Background: Hypertext Publishing – Technology behind the web.

Unit II: Cascading Style Sheets&JavaScripts (6 HRS)

CSS introduction - CSS properties - Controlling Fonts, Text formatting - Text- pseudo classes, Selectors, Links, Backgrounds, Lists - Introduction to

Java Script - Functions and events - Popup boxes-alert, prompt, conform box - Built-in objects, writing JavaScript form validation

Unit III: Introduction to PHP   (6 HRS)

Introduction - Server side scripting - Role of web server software - PHP comments, variables - echo and print - PHP operators, data types - Branching statements - Loops – Arrays

Unit IV: PHP functions, Cookie, Error Handling   (6 HRS)

PHP functions - PHP form - Passing information between pages, $_GET, $_POST, $_REQUEST. - String functions - session and cookie management - Error handling in PHP

Unit V: PHP with MYSQL   (6 HRS)

Functions for MySQL connectivity and operation- mysql_connect, mysql_select_db, mysql_query - mysql_fetch_row, mysql_fetch_array, mysql_result, mysql_list_fields, mysql_num_fields, insertion - Updation and deletion of data using PHP - Displaying data from MySQL in webpage

REFERENCES:

1. Dave W Mercer, Allan Kent, Steven D Nowicki, David Mercer, Dan Squier, Wankyu Choi - Beginning PHP‖, Wiley Publishing, Inc

2. Ivan Bayross -"HTML, DHTML, JavaScript, Pearl & CGI", Fourth Revised Edition, BPB Publication

3. "Programming PHP",RasmusLerdorf and Kevin Tatore, Shroff Publishers & Distributors Pvt.Ltd

4. "Beginning PHP", Dave W Mercer, Allan Kent, Steven D Nowicki, David Mercer, Dan Squier, Wankyu Choi, Wiley Publishing

OPEN EDUCATIONAL RESOURCES:

1. https://www.tutorialspoint.com › php

2. https://www.php.net › manual › tutorial

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 introduction to E commerce				
1.1	Welcome to Electronic Commerce: Electronic commerce Framework –	2	Demonstration	Desktop PC
1.2	Electronic Commerce and Media Convergence	1	Demonstration	Desktop PC
1.3	The Anatomy of E-commerce-Electronic Commerce Consumer Applications	1	Demonstration	Desktop PC
1.4	**Electronic Commerce and World Wide Web:** Architectural Framework for Electronic Commerce	1	Demonstration	Desktop PC
1.5	World Wide Web as the Architecture – Web Background: Hypertext Publishing – Technology behind the web.	1	Demonstration	Desktop PC
UNIT -2 CASCADING STYLE SHEETS& JAVASCRIPTS				
2.1	CSS introduction - CSS properties - Controlling Fonts	2	Demonstration	Desktop PC
2.2	Text formatting - Text- pseudo classes, Selectors, Links,	1	Demonstration	Desktop

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Backgrounds, Lists			PC
2.3	Introduction to Java Script - Functions and events - Popup boxes-alert, prompt, conform box	2	Demonstration	Desktop PC
2.4	Built-in objects, writing JavaScript form validation	1	Demonstration	Desktop PC
UNIT -3 INTRODUCTION TO PHP				
3.1	Introduction, Server side scripting, Role of web server software	1	Demonstration	Desktop PC
3.2	PHP comments, variables - echo and print	1	Demonstration	Desktop PC
3.3	PHP operators, data types	1	Demonstration	Desktop PC
3.4	Branching statements ,Loops ,Arrays	1	Demonstration	Desktop PC
UNIT -4 PHP FUNCTIONS, COOKIE, ERROR HANDLING				
4.1	PHP Functions	2	Demonstration	Desktop PC
4.2	PHP form, Passing information between pages	1	Demonstration	Desktop PC
4.3	-, $_GET, $_POST,_REQUEST.	1	Demonstration	Desktop PC
4.4	String functions - session and	1	Demonstratio	Desktop

Modul e No.	Topic	No. of Lecture s	Teaching Pedagogy	Teaching Aids
	cookie management		n	PC
4.5	Error handling in PHP	1	Demonstratio n	Desktop PC
UNIT -5 PHP with MYSQL				
5.1	Functions for MySQL connectivity and operation, insertion	1	Demonstratio n	Desktop PC
5.2	Queries on Select, Update	1	Demonstratio n	Desktop PC
5.3	Queries in fetch, List	1	Demonstratio n	Desktop PC
5.4	Updation and deletion of data using PHP	1	Demonstratio n	Desktop PC
5.5	Displaying data from MySQL in webpage	1	Demonstratio n	Desktop PC

- **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	Describe fundamentals of web.Introduce the creation of static webpage using HTML.	K2 & K3	PSO1& PSO2
CO 2	Describe the importance of CSS in web development	K2 & K3	PSO2 &PSO3
CO 3	Describe the function of JavaScript as a dynamic webpage creating tool	K2 & K3	PSO2, PSO3&PSO7
CO 4	Distinguish PHP as a server side programming language	K2 & K3	PSO2, PSO3 &PSO7
CO 5	Outline the principles behind using MySQL as a backend DBMS with PHP	K3 & K4	PSO7& PSO8

Mapping of C0s with PSOs

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

Weightage of course contribute to each PSO	15	11	8	13	13	13

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:

HOD'S Signature& Name

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
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)

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:

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	Introduction to Data Mining- its importance — Data Mining on what kind of Data- Data Mining Functionalities-	5	Chalk & Talk	Black Board
1.2	What Kinds of Patterns Can Be Mined – Are All of the Patterns Interesting – Classification of Data Mining Systems - Data Mining Task Primitives –	6	Chalk & Talk	LCD
1.3	Integration of Data Mining - System with a Database or Data Warehouse System- Major Issues in Data Mining (Self Study)	3	Discussion	Google Classroom
UNIT -2	**DATA PREPROCESSING**			
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	5	Chalk &Talk	Green

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Technology : An Overview - What is a Data Warehouse – A Multidimensional Data Model - Data Warehouse Architecture			Board
2.3	Data Warehouse implementation - From Data Warehousing to a Data Mining	3	Discussion	Google Classroom
UNIT -3 MINING 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 CLUSTER ANALYSIS				
4.1	What is Cluster Analysis – Types of Data in Cluster Analysis	3	Chalk & Talk	Black Board
4.2	A Categorization of Major Clustering Methods Partitioning Methods	6	Lecture	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.3	Hierarchical Methods – Density-Based Methods	3	Chalk & Talk	LCD
4.4	Grid-Based Methods – Model-Based Clustering Methods	2	Chalk & Talk	Black Board
UNIT -5 APPLICATIONS AND TRENDS IN DATA MINING				
5.1	Data Mining Applications – Data Mining System Products and Research Prototypes	6	Chalk & Talk	Black Board
5.2	Additional Themes on Data Mining -Social Impacts of Data Mining - Trends in Data Mining (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

- **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 applications and in major issues.	K4 ,K5	PSO1, PSO2, PSO3& PSO9

Mapping of C0s 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	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

CBCS Curriculum for M. Sc Information Technology

II M.Sc.,
SEMESTER –III

Skill Development 100%

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT13	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)

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:

1. Richard L.Halterman ,"LEARNING TO PROGRAM WITH PYTHON",ELITE PUBLISHING, 2011

2. Ch. Satyanarayana, M. Radhikamani, 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

4.

5. 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 Examples-More Arithmetic Operators-Algorithms (Self	4	Group discussion	White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	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 -3	**LISTS & 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 List.	4	Lecture	Green Board

CBCS Curriculum for M. Sc Information Technology

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
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 -4	**OBJECT 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 -5	**TKINTER , 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 –	4	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	Message – Combo box – Scale – Canvas.			
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

6.

7.

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 %

8.

CIA	
Scholastic	35
Non Scholastic	5
	40

9.

10.

11.   EVALUATION PATTERN

12.

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

13.
14.   **C1** – Average of Two Session Wise Tests
15.   **C2** – Average of Two Monthly Tests
16.   **C3** - Mid Sem Test
17.   **C4** – Best of Two Weekly Tests
18.   **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 of C0s 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	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.Staff Name : V. Mageshwari

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

Employability 100%

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3IT14	LAB IN DATA MINING AND DATA WAREHOUSING	Practical	5	3

COURSE DESCRIPTION

Data Mining and Data Warehousing consists of introduction about data mining, data warehousing, data pre-processing, :mining frequent pattern, association, classification and cluster analysis and applications of data mining.

COURSE OBJECTIVES

- To assess data preprocessing steps involved in different datasets
- To evaluate classification algorithms using Weka tool with sample data.
- To evaluate clusters algorithms using Weka tool with sample data .

DATA MINING AND DATA WAREHOUSE PROGRAM - WEKA TOOL

1. Rules for identifying attributes.
2. Listing of categorical attributes and the real-valued attributes separately.
3. Demonstration of preprocessing on dataset student.arff
4. Demonstration of Association rule process on dataset test.arff using apriori algorithm
5. Training a decision tree algorithm.
6. Test on classification of decision tree.
7. Demonstration of classification rule process on dataset employee.arff using j48 algorithm.

8. Demonstration of classification rule process on dataset employee.arff using id3 algorithm
9. Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm
10.   Demonstration of clustering rule process on dataset student.arff using simple k-m

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
LAB PROGRAMS				
1	Rules for identifying attributes.	8	Demonstration	Desktop
2	Listing of categorical attributes and the real-valued attributes separately.	8	Demonstration	Desktop
3	Demonstration of preprocessing on dataset student.arff	8	Demonstration	Desktop
4	Demonstration of Association rule process on dataset test.arff using apriori algorithm	10	Demonstration	Desktop
5	Training a decision tree algorithm	10	Demonstration	Desktop
6	Demonstration of classification rule process on dataset employee.arff using j48 algorithm	10	Demonstration	Desktop
7	Test on classification of decision tree.	10	Demonstration	Desktop
8	Demonstration of classification rule process on dataset employee.arff using id3 algorithm	10	Demonstration	Desktop

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
9	Demonstration of classification rule process on dataset employee.arff using naïve bayes algorithm	8	Demonstration	Desktop
10	Demonstration of clustering rule process on dataset student.arff using simple k-m	8	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	Utilize Weka tool to evaluate Data Mining algorithms.	K4 & K5	PSO1, PSO2& PSO4
CO 2	Demonstrate preprocessing steps involved in different datasets.	K4 & K5	PSO4, PSO5, PSO6&PSO7
CO 3	Develop the decision tree algorithm using different datasets	K4 & K5	PSO3, PSO7, PSO8 &PSO9
CO 4	Demonstrate the classification and clusters algorithms using large datasets.	K4 & K5	PSO4, PSO6 &PSO7
CO 5	Analyze Data Mining techniques for realistic data.	K4 & K5	PSO8, PSO9

Mapping of C0s 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	3	2	1	2	1	1
CO2	1	1	2	3	3	3	3	1	2
CO3	2	2	3	2	1	2	3	3	3
CO4	1	2	2	3	2	3	3	1	2
CO5	2	2	1	2	2	2	2	3	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 varamanisulekha**

Forwarded By

V. Mageshwari

HOD'S Signature

& Name

II M.Sc.,

SEMESTER –III

For those who joined in 2019 onwards

Employability 100%

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
PSIT	19PG3IT 15	LAB IN ADVANCED PYTHON PROGRAMMING	Practical	5	3

COURSE DESCRIPTION

This course content plays a vital role in building the basic programming skill in Python.

COURSE OBJECTIVES

The focus of the lab is to provide students with an introduction to visualizethe real time problems using the Python programming language as a practical session. The goal of this course is to train the students to face the industrial requirements.

PROGRAM LIST

1. Program using String

2. Program using List

3. Program using Dictionary

4. Program using Tuple

5. Program using Sets

6. Program using Array

7. Program using Condition Statements and Loops

8. Program using Functions

9. Program using Date Time

10. Program using Class

11. Program using Data Structure

12. Program using Search and Sorting

13. Program using Recursion

14. Program using Math

15. Program using File I/O

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1	Program using String	6	Demonstration	Desktop PC
2	Program using List	6	Demonstration	Desktop PC
3	Program using Dictionary	6	Demonstration	Desktop PC
4	Program using Tuple	6	Demonstration	Desktop PC
5	Program using Sets	6	Demonstration	Desktop PC
6	Program using Array	6	Demonstration	Desktop PC
7	Program using Condition Statements and Loops	6	Demonstration	Desktop PC

8	Program using Functions	6	Demonstration	Desktop PC
9	Program using Date Time	6	Demonstration	Desktop PC
10	Program using Class	6	Demonstration	Desktop PC
11	Program using Recursion	6	Demonstration	Desktop PC
12	Program using Search and Sorting	6	Demonstration	Desktop PC
13	Program using Math	6	Demonstration	Desktop PC
14	Program using Loops	6	Demonstration	Desktop PC
15	Program using File I/O	6	Demonstration	Desktop PC

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	Demonstrate the basic concepts of variables expressions.	K4 & K5	PSO8, PSO9

CO 2	Develop basic python programs with I/O operations.	K4 & K5	PSO8, PSO9
CO 3	Develop programs with function control structure.	K4 & K5	PSO8, PSO9
CO 4	Apply strings and lists in python.	K4 & K5	PSO8, PSO9
CO 5	Develop python programs with files.	K4 & K5	PSO8, PSO9

Mapping of C0s with PSOs

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

Mapping of C0s 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.Staff Name

Forwarded By

                                    HOD'S Signature

                                        & Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE4	SOFTWARE TESTING	PG Core	5 Hrs.	5

COURSE DESCRIPTION

To study fundamental concepts in software testing, planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

COURSE OBJECTIVES

- To give strong foundation in software quality assurance by teaching standards, models and measurement techniques.
- To enhance the knowledge of the students to provide innovative solutions to various quality assurances related problems.

UNITS

UNIT I:QUALITY ASSURANCE (14 Hrs)

Introduction to Quality:Introduction,What is quality, Definition of quality,Quality view. **Software Quality:**Introduction, Characteristics of software,Software development process, Software Quality Management, Important quality management

Basic Concepts of Software Testing: Introduction,Definition of testing,Approaches to testing,Popular definition of testing,Testing during development life cycle,Principles of software testing,salient feature of good testing,TestPlanning,Catageries of defect,Defect,Error,Mistake in software,

Developing testing methodologies(test plan),Testing process(Self Study),Test methodologies/Approcahes.

UNIT II: SOFTWARE VERIFICATION AND VALIDATION   (14 Hrs)

Verification:Verification work bench,Methods of verification,Types of Review on the Basis of Stage/Phase,Coverage in Verification. **Validation:** Validation Work Bench,Levels of Work Bench,Management of verification and validation,Software Development Verification and Validation Activities.

V Test Model: Introduction,V Model for software,**Testing During Proposal Stage,Testing during Requirement Stage,Testing During Test-Planning Phase,(Self Study)**Testing During Coding Phase,**DefectManagement**:DefectClassification,Defect Management Process(fixing and Root Cause of Defect),Techniques for Finding Defects

UNIT III: TESTING TECHNIQUES   (14Hrs)

Levels of Testing: Introduction,ProposalTesting,DesignTesting,UnitTesting,ModuleTesting,IntegrationTesting,SystemTesting,Testing Stages.

Acceptance Testing: AlphaTesting,BetaTesting,Gamma Testing

Special Tests:ComplexityTesting,Graphical User Interface Testing,CompatabilityTesting,PerformanceTesting,Volume Testing and Stress Testing,**Ad-Hoc Testing Monkey Testing, Exploratory Testing,Random Testing(Self-Study)**

UNIT IV: TESTING PROCESS   (14Hrs)

Test Planning:Introduction,TestPlanning,TestPlan,Quality plan and Test Plan,Quality plan template,TestEstimation,Building test data and test cases,TestScenario,TestCases,Essential Activities in Testing,Template for test cases,Building Test Data,Roles and Responsibilities in Testing Life Cycle,Test Progress Monitoring,**Test Metrics ,Testing Related Data, Effectiveness of Testing,DefectDensity,Defect Leakage Ration(Self-Study)**

UNIT V :TESTING TOOLS   (14 Hrs)

Software Testing Tool:AnOverview:Need for Automation Testing Tools,Taxonomy of Testing Tool,Functional Regression Testing Tools,Performance Testing Tool,Testing Management Tool,Source Code Testing Tool,Load Runner – Overview of LoadRunner – Creating Vuser script

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

Tools used in real time applications and their implementations

TEXT BOOK:

3. *Software Testing - Principles, Techniques and Tools,* M.G. Limaye, Tata McGraw-Hill Education Private Ltd., 2017.
4. *Software Testing Tools,* Dr.K.V.K.K.Prasad, Published by Dreamtech Press, Edition, 2012.   Chapters :3, 7 , 8

REFERENCES:

*1. Software Quality Assurance : Principles and Practice for the New Paradigm,*N.S.Godbole, 2nd Edition, Narosa Publishing House, 2017.Chapters: 1, 2.1, 2.5, 4.4 - 4.6, 6.1 - 6.12

2. Software Quality and Testing: A Concise Study, S. A. Kelkar, 3rd Edition, PHI Learning, 2012.

5. *Software Testing - Principles, Techniques and Tools,* M.G. Limaye, Tata McGraw-Hill Education Private Ltd., 2017.
6. *Software Testing Tools,* Dr.K.V.K.K.Prasad, Published by Dreamtech Press, Edition, 2012.   Chapters :3, 7 , 8

REFERENCES:

Software Quality and Testing: A Concise Study, S. A. Kelkar, 3rd Edition, PHI Learning, 2012.

COURSE CONTENTS & LECTURE SCHEDULE

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 INTRODUCTION				
1.1	Generic view of Process – Software Engineering	1	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.2	A layered technology – A process framework	1	Chalk & Talk	LCD
1.3	The capability Maturity Model Integration (CMMI)	4	Lecture	PPT & White board
1.4	Process patterns – Process Assessment	1	Lecture	Smart Board
1.5	Personal and Team Process Models – Process Technology	1	Lecture	Black Board
1.6	Product and Process – Specialized Process Models	1	Chalk & Talk	Black Board
1.7	The Unified Process –Agility – Agile Process(Self Study)	2	Discussion	Google classroom
1.8	Agile Process Models(Self Study)	1	Discussion	Google classroom
UNIT -2 SYSTEM MODELING REQUIREMENTS				
2.1	System Engineering – Computer Based Systems	1	Lecture	Green Board Charts
2.2	System Modeling Requirements Engineering – A bridge to design and construction	2	Chalk & Talk	Green Board
2.3	Requirements engineering tasks, developing Use-Cases	2	Chalk & Talk	Black Board
2.4	Building the analysis model Requirement Analysis	2	Chalk & Talk	Black Board
2.5	Analysis modeling approaches	2	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.6	Data modeling concepts - Object- Oriented Analysis – Class based modeling (Self Study)	3	Discussion	Google classroom
UNIT -3 DESIGN ENGINEERING				
3.1	Design Engineering – Design within the context of Software Engineering	3	Chalk & Talk	Black Board
3.2	Design Process and Design Quality Creating an Architectural Design- Software Architecture	4	Chalk & Talk	Black Board
3.3	Data design Modeling Component level design Component- Designing Class-Based Components(Self Study)	4	Discussion	Google classroom
UNIT -4 USER INTERFACE DESIGN				
4.1	Performing User Interface Design – The Golden Rules	3	Chalk & Talk	Black Board
4.2	User Interface analysis and Design Testing Strategies	3	Chalk & Talk	Black Board
4.3	A strategic approach to software testing	3	Chalk & Talk	Black Board
4.4	Test strategies for Object-Oriented Software - Testing Tactics - Object Oriented Testing Methods (Self Study)	3	Discussion	Google classroom
UNIT -5 UML				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.1	Introducing the UML	3	Chalk & Talk	Black Board
5.2	Classes – Class Diagrams	3	Chalk & Talk	Black Board
5.3	Use cases- Use case diagrams- Case Study	4	Discussion	Smart board
UNIT -6 DYNAMISM				
6.1	Case study in software engineering tools and techniques	3	Group Discussion	LCD & PPT

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

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	Discuss various software application domains and different process model used in software development.	K2	PSO1,PSO2
CO 2	Demonstrate the basics of software quality assurance and defect prevention.	K2, K3	PSO4,PSO5

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 3	Compare different testing strategies and tactics.	K3,K4	PSO5,PSO6
CO 4	Apply the software testing techniques in commercial environment.	K3, K4	PSO3,PSO6
CO 5	Explain high performance testing using Jmeter.	K4, K5	PSO6,PSO8

Mapping of COs with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

Mapping of COs with POs

CBCS Curriculum for M. Sc Information Technology

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

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

♦WeaklyCorrelated -**1**

COURSE DESIGNER: Mrs. I.Razul Beevi

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

Employability 100%

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEE K	CREDIT S
PSIT	22PG3IT E5	SYSTEM SOFTWARE AND COMPILER DESIGN	Lecture	5	5

COURSE DESCRIPTION

The primary goals will be to make the students obtain in depth knowledge on system software and working principles of compiler.

COURSE OBJECTIVES

- Develop a grasp of the system software and compiler analyses.
- Understand the concepts of Assembler, Linker, Loader and Compilers.

UNITS

UNIT I: INTRODUCTION TO SYSTEM SOFTWAREAND ASSEMBLERS

(10Hrs)

Introduction to system software and machine architecture-simplified instructional computer-CISC Machines-RISC Machines-Basic Assembler Functions-Machine Dependent Assembler Features-Machine Independent Assembler Features-Assembler Design Options.

UNIT II: LOADERS AND LINKERS (12 Hrs)

Basic Loader Functions- Machine Dependent Loader Features- Machine Independent Loader Features- Loader Design Options.

UNIT III: COMPILERS   (10 Hrs)

Basic Compiler Functions - Machine-Dependent Compiler features – Machine-Independent Complier Features -Compiler Design Options

UNIT IV: LEXICAL ANALYZER   (12 Hrs)

Need and Role of Lexical Analyzer-Simple Approach to the Design of Lexical Analyser-Regular Expressions-Finite Automata-Language for specifying Lexical Analyzer –Implementation of Lexical Analyser- Design of Lexical Analyzer for a sample language.

UNIT V: SYNTAX ANALYZER   (12 Hrs)

Syntax Analyzer (Parser): The Role of Parser-Context free Grammars-Shift reduce Parsing -Operator-Precedence Parsing-Top-Down Parsing-Predictive Parsers

UNIT V: DYNAMISM

Analyze the concepts of Various types of Compilers

TEXT BOOK:

1. "System Software – An Introduction to Systems Programming" by Leland L. Beck, D. Manjula, Pearson, ISBN: 978-81-317-6281-3.
2. "Principles of Compiler Design" by Alfred V. Aho Jeffrey D. Ullman, Narosa Publishing House, ISBN: 81-85015-61-9

REFERENCES:

1. "Compiler Design" by Dr.S.Malathi, K.Kiruthika, Jackulin C, Ane Books Pvt Ltd, ISBN: 978-93-8546-259-7.

Open Educational Resources:
1. https://www.javatpoint.com/system-software
2. https://www.guru99.com/compiler-design-tutorial.html

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DIGITAL DATA & BIG DATA				
1.1	Types of Digital Data – Introduction	4	Discussion	Black Board
1.2	Characteristics of Big data – Evolution of Big data –	4	Chalk & Talk	Black Board
1.3	Big Data - BI versus Big Data – Data warehouse Environment –	4	Lecture	LCD
1.4	Hadoop Environment	2	Discussion	Google classroom
UNIT -2 BIG DATA ANALYTICS & TECHNOLOGY				
2.1	Big Data Analytics – Challenges in Big Data	4	Lecture	PPT & White board
2.2	Importance of Big data Analytics – Terminologies used in Big Data	4	Chalk & Talk	Green Board
2.3	NoSQL Databases – Advantages of NoSQL – Use of NoSQL – SQL versus NoSQL – NewSQL - Features of Hadoop	4	Chalk & Talk	Black Board
2.4	Advantages of Hadoop - Hadoop EcoSystem – Hadoop versus SQL	2	Chalk & Talk	Black Board
UNIT – 3 HADOOP				
3.1	Introduction to Hadoop – Hadoop Overview	4	Chalk & Talk	Green Board
3.2	Hadoop Distributed File System	4	Discussion	Google classroom

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
3.3	Processing Data with Hadoop	4	Chalk & Talk	Black Board
3.4	Hadoop Ecosystem	2	Chalk & Talk	Black Board
UNIT – 4 MANGODB				
4.1	Introduction to MangoDB – Data Types in MangoDB	4	Discussion	PPT & White board
4.2	Insert method – Save method –	4	Chalk & Talk	Green Board
4.3	adding and removing fields – Array- Aggregate function	4	Chalk & Talk	Black Board
4.4	Cursors in MangoDB	2	Chalk & Talk	Black Board
UNIT – 5 MAPREDUCE & MACHINE LEARNING				
5.1	Mapper – Reducer – Combiner – Practitioner	4	Lecture	PPT & White board
5.2	Searching – Sorting – Machine Learning algorithms:	4	Discussion	PPT & White board
5.3	Regression model – clustering – collaborative filtering	4	Lecture	Black Board
5.4	Association rule mining - decision tree	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Advanced Concepts in Big Data Analytics	5	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i)	Section A (ii)	Section B	Section C	Section D	Section E	Total	

	5 Mks.	5 Mks	8 Mks.	12 Mks	20 Mks.	10 Mks.	60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

Nos

C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks
C4	-	Open Book Test/PPT	2 *	-	5 Mks
C5	-	Quiz	2 *	-	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	Interpret the concepts of system software and machine architecture	K2	PSO1, PSO4
CO 2	Identify the concepts of loader and linkers	K2, K3	PSO2, PSO5
CO 3	Analyse the concepts of working principles of compilers	K3, K4	PSO5, PSO6
CO 4	Experiment Finite Automata for regular expressions.	K3, K4	PSO3, PSO6
CO 5	Simplify the expressions using Parser	K4, K5	PSO6, PSO8

Mapping of C0s with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

Mapping of C0s with POs

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

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

♦WeaklyCorrelated -**1**

COURSE DESIGNER: Dr. N. Kalaichelvi

Forwarded By

HOD'S Signature

& Name

IIM.Sc IT

SEMESTER –III

Skill Development 100%

For those who joined in 2021 onwards

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
PSIT	21PG3ITE6	COMPUTER FORENSICS	Lecture	4	5

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:

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
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

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
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 investigations- investigating	3	Lecture	Black Board
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

- **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 of COs with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3

Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

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.,

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	21PG3ITE7	BIG DATA ANALYTICS-	PG Core	5Hrs.	5

COURSE DESCRIPTION

Big Data Analytics includes Introduction to Big Data, Big Data Analytics, The Big Data Technology, Introduction to MAPREDUCE Programming: and Introduction to Recommendation Engines.

COURSE OBJECTIVES

- To understand Characteristics and challenges of Big Data
- To interpret Big Data Analytics and Big Data Technologies
- To demonstrate MAPREDUCE Programming and Recommendation Systems

UNITS

UNIT I: INTRODUCTION   (14Hrs)

Introduction to Big Data: Characteristics of Data – Evolution of Big Data – Definition of Big Data – Challenges with Big Data – What is Big Data – Other Characteristics of Data Which are not Definitional Traits of Big Data – Why Big Data – Are we just an Information Consumer or Do we also Produce Information – Traditional Business Intelligence(BI) versus Big Data – A Typical Data warehouse Environment – **A Typical Hadoop Environment – What is New Today – What is Changing in the Realms of Big Data(Self study).**

UNIT II :BIG DATA ANALYTICS   (14 Hrs)

Big Data Analytics: Classification of Analytics – Greatest Challenges that Prevent Businesses from Capitalizing on Big Data – Top Challenges Facing Big Data – Why is Big Data Analytics Important – What kind of Technologies are we Looking Toward to Help Meet the Challenges Posed by Big Data – Data Science – Data Scientist Your New Best Friend - **Terminologies Used in Big Data Environments – Basically Available Soft State Eventual Consistency – Few Top Analytics Tools(Self study).**

UNIT III: THE BIG DATA TECHNOLOGY   (14 Hrs)

  The Big Data Technology Landscape:– Hadoop. Features of Hadoop. Key advantages of Hadoop, Version of Hadoop- Overview of hadoop Ecosystems- Hadoop distributios- Hadoop verus SQL – Integrated Hadoop System Offered by Leading Markers Vendors- Cloud – based Hadoop Solutions. Introduction to Hadoop**:** Introducing Hadoop – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – Distributed Computing Challenges – History of Hadoop – Hadoop Overview – Use Case of Hadoop – Hadoop Distributors – HDFS (Hadoop Distributed File System) – **Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN (Yet Another Resource Negotiator) – Interacting with Hadoop Ecosystem(Self study).**

UNIT IV :INTRODUCTION TO MAP REDUCE PROGRAMMING   (14 Hrs)

Introduction to MAP REDUCE Programming: Introduction – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression.Introduction to Machine Learning: Introduction to Machine Learning – Machine Learning Algorithm-Regression Model- Linear Regression- Clustering- Collaboration filtering- Association Rule Mining- **Decision Tree(Self study).**

UNIT V: RECOMMENDATION ENGINES   (14 Hrs)

Introduction to Recommendation Engines: Recommendation engine definition – Need for Recommender Systems – Big Data Driving the Recommender Systems – Types of Recommender Systems –Evolution of Recommender Systems with Technology. Evolution of Recommendation

Engines Explained: Evolution of Recommendation Engines – Nearest Neighborhood-based **Recommendation Engines – Content-based**Recommender Systems – Hybrid Recommender Systems – Model-based Recommender Systems.(Self study)

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

Current scenario in Big Data Analytical technologies

REFERENCES:

1. Big Data and Analytics, SeemaAcharya andSubhashiniChellappan, 2nd edition ,Wiley India Private Limited, 2017.   Chapters : 2,3, 4.2 - 5, 8,12.

2**. Building Recommendation Engines. -Suresh Kumar Gorakala,** 1st edition, Packt Publishing Limited, United Kingdom, 2016. Chapters: 1, 3

3.Big Data Strategies , Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.

4.Big Data, Dr. Anil Maheshwari, 1st edition , Published by McGraw Hill Education (India) Private Limited, 2017.

5. Big Data Fundamentals Concepts, Driver & Techniques, Thomas Erl,WajidKhattak and Paul Buhler, 3rd Edition, Pearson publication, 2018.

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DIGITAL DATA & BIG DATA				
1.1	Types of Digital Data – Introduction	4	Discussion	Black Board
1.2	Characteristics of Big data – Evolution of Big data –	4	Chalk & Talk	Black Board
1.3	Big Data - BI versus Big Data – Data warehouse Environment –	4	Lecture	LCD
1.4	Hadoop Environment	2	Discussion	Google classroom
UNIT -2BIG DATA ANALYTICS & TECHNOLOGY				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
2.1	Big Data Analytics – Challenges in Big Data	4	Lecture	PPT & White board
2.2	Importance of Big data Analytics – Terminologies used in Big Data	4	Chalk & Talk	Green Board
2.3	NoSQL Databases – Advantages of NoSQL – Use of NoSQL – SQL versus NoSQL – NewSQL - Features of Hadoop	4	Chalk & Talk	Black Board
2.4	Advantages of Hadoop - Hadoop EcoSystem – Hadoop versus SQL	2	Chalk & Talk	Black Board
UNIT – 3 HADOOP				
3.1	Introduction to Hadoop – Hadoop Overview	4	Chalk & Talk	Green Board
3.2	Hadoop Distributed File System	4	Discussion	Google classroom
3.3	Processing Data with Hadoop	4	Chalk & Talk	Black Board
3.4	Hadoop Ecosystem	2	Chalk & Talk	Black Board
UNIT – 4 MANGODB				
4.1	Introduction to MangoDB – Data Types in MangoDB	4	Discussion	PPT & White board
4.2	Insert method – Save method –	4	Chalk & Talk	Green Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.3	adding and removing fields – Array- Aggregate function	4	Chalk & Talk	Black Board
4.4	Cursors in MangoDB	2	Chalk & Talk	Black Board
UNIT – 5 MAPREDUCE & MACHINE LEARNING				
5.1	Mapper – Reducer – Combiner – Practitioner	4	Lecture	PPT & White board
5.2	Searching – Sorting – Machine Learning algorithms:	4	Discussion	PPT & White board
5.3	Regression model – clustering – collaborative filtering	4	Lecture	Black Board
5.4	Association rule mining - decision tree	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Advanced Concepts in Big Data Analytics	5	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1	T2	Quiz	Assignment	OBT/PPT				

CBCS Curriculum for M. Sc Information Technology

	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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**

UG CIA Components

Nos

C1 - Test (CIA 1)   1   -   10 Mks

C2 - Test (CIA 2)   1   -   10 Mks

C3 - Assignment   1   -   5 Mks

C4 - Open Book Test/PPT   2 *   -   5 Mks

C5 - Quiz   2 *   -   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 Characteristics and challenges of Big Data	K2	PSO1& PSO2
CO 2	Describe the concepts of Big Data Analytics	K2	PSO4
CO 3	Utilize Hadoop for Big Data Technologies	K3, K4	PSO5, PSO6
CO 4	Demonstrate MAPREDUCE Programming	K3, K4	PSO3, PSO9
CO 5	Describe types of Recommendation Systems using Big Data Analytics.	K4, K5	PSO6, PSO8

Mapping of C0s with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

Mapping of COs with POs

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

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

♦WeaklyCorrelated -**1**

COURSE DESIGNER:

1. Staff Name V. Mageshwari

Forwarded By

HOD'S Signature

& Name

II M.Sc.

SEMESTER –III

For those who joined in 2019 onwards

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

Skill Development 100%

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 IoTdevices.

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, ArshdeepBahga, 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 CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DIGITAL DATA & BIG DATA				
1.1	Types of Digital Data – Introduction	4	Discussion	Black Board
1.2	Characteristics of Big data – Evolution of Big data –	4	Chalk & Talk	Black Board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
1.3	Big Data - BI versus Big Data – Data warehouse Environment –	4	Lecture	LCD
1.4	Hadoop Environment	2	Discussion	Google classroom
UNIT -2BIG DATA ANALYTICS & TECHNOLOGY				
2.1	Big Data Analytics – Challenges in Big Data	4	Lecture	PPT & White board
2.2	Importance of Big data Analytics – Terminologies used in Big Data	4	Chalk & Talk	Green Board
2.3	NoSQL Databases – Advantages of NoSQL – Use of NoSQL – SQL versus NoSQL – NewSQL - Features of Hadoop	4	Chalk & Talk	Black Board
2.4	Advantages of Hadoop - Hadoop EcoSystem – Hadoop versus SQL	2	Chalk & Talk	Black Board
UNIT – 3 HADOOP				
3.1	Introduction to Hadoop – Hadoop Overview	4	Chalk & Talk	Green Board
3.2	Hadoop Distributed File System	4	Discussion	Google classroom
3.3	Processing Data with Hadoop	4	Chalk & Talk	Black Board
3.4	Hadoop Ecosystem	2	Chalk & Talk	Black Board
UNIT – 4 MANGODB				

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
4.1	Introduction to MangoDB – Data Types in MangoDB	4	Discussion	PPT & White board
4.2	Insert method – Save method –	4	Chalk & Talk	Green Board
4.3	adding and removing fields – Array- Aggregate function	4	Chalk & Talk	Black Board
4.4	Cursors in MangoDB	2	Chalk & Talk	Black Board
UNIT – 5 MAPREDUCE & MACHINE LEARNING				
5.1	Mapper – Reducer – Combiner – Practitioner	4	Lecture	PPT & White board
5.2	Searching – Sorting – Machine Learning algorithms:	4	Discussion	PPT & White board
5.3	Regression model – clustering – collaborative filtering	4	Lecture	Black Board
5.4	Association rule mining - decision tree	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Advanced Concepts in Big Data Analytics	5	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %
Non Scholastic	-	-	-	-	-		5	5	12.5 %
Total	10	10	5	5	5	35	5	40	100 %

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %

K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

			Nos		
C1	-	Test (CIA 1)	1	-	10 Mks
C2	-	Test (CIA 2)	1	-	10 Mks
C3	-	Assignment	1	-	5 Mks

C4 - Open Book Test/PPT   2 *****   -   5 Mks

C5 - Quiz   2 *****   -   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 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	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3

Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

Mapping of C0s with POs

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

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

♦WeaklyCorrelated -**1**

COURSE DESIGNER:

1. **Staff Name T. CharanyaNagammal**

Forwarded By

HOD'S Signature

& Name

II M.Sc.,
SEMESTER –III
For those who joined in 2022 onwards

Employability 100%

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	22PG3IT E9	ALGORITHM DESIGN AND ANALYSIS	Lecture	4	5

COURSE DESCRIPTION

This course introduces basic methods for the designand analysis of efficient algorithms emphasizing methods useful in practice.

COURSE OBJECTIVES

To facilitate the student to analyze performance of algorithms and to choose the appropriate data structure and algorithm design method for a specified application.

UNITS

UNIT I: INTRODUCTION   (11 HRS.)

Algorithm -Psuedo code for expressing algorithms - Performance Analysis- Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis. **Divide and conquer:** General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

UNIT II: SEARCHING AND TRAVERSAL TECHNIQUES   (11 HRS.)

Efficient non - recursive binary tree traversal algorithm - Disjoint set operations, union and find algorithms - Spanning trees - Graph traversals - Breadth first search and Depth first search - Connected Components, Bi -

connected components - Disjoint Sets- disjoint set operations, union and find algorithms - Spanning trees, connected components and biconnected components.

UNIT III: GREEDY METHOD AND DYNAMIC PROGRAMMING   (11 HRS.)

Greedy Method: General method, applications - Job sequencing with deadlines, 0/1 knapsack problem - Minimum cost spanning trees - Single source shortest path problem.

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem - All pairs shortest path problem - Travelling sales person problem - Reliability design.

UNIT IV: BACKTRACKING AND BRANCH AND BOUND   (11 HRS.)

Backtracking: General method - applications-n-queen problem - sum of subsets problem - graph coloring - Hamiltonian cycles.

Branch and Bound: General method - applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution - FIFO Branch and Bound solution.

UNIT V: NP-HARD AND NP-COMPLETE PROBLEMS   (11 HRS.)

NP-Hard and NP-Complete problems: Basic concepts - non deterministic algorithms, NP - Hard and NPComplete classes - Cook's theorem.

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

Recent advancement in algorithm analysis.

TEXT BOOKS:

1. Fundamentals of Computer Algorithms, Ellis Horowitz,SatrajSahni and Rajasekharam,Galgotia publications pvt. Ltd.

REFERENCES:

1. Foundations of Algorithm, 4th edition, R. Neapolitan and K. Naimipour, Jones and Bartlett Learning.
2. Design and Analysis of Algorithms, P. H. Dave, H. B. Dave, Pearson Education, 2008.

Open Educational Resources:

1. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/analysis_of_algorithms.htm

COURSE CONTENTS & LECTURE SCHEDULE:

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
UNIT -1 DIGITAL DATA & BIG DATA				
1.1	Types of Digital Data – Introduction	4	Discussion	Black Board
1.2	Characteristics of Big data – Evolution of Big data –	4	Chalk & Talk	Black Board
1.3	Big Data - BI versus Big Data – Data warehouse Environment –	4	Lecture	LCD
1.4	Hadoop Environment	2	Discussion	Google classroom
UNIT -2 BIG DATA ANALYTICS & TECHNOLOGY				
2.1	Big Data Analytics – Challenges in Big Data	4	Lecture	PPT & White board
2.2	Importance of Big data Analytics – Terminologies used in Big Data	4	Chalk & Talk	Green Board
2.3	NoSQL Databases – Advantages	4	Chalk &	Black

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
	of NoSQL – Use of NoSQL – SQL versus NoSQL – NewSQL - Features of Hadoop		Talk	Board
2.4	Advantages of Hadoop - Hadoop EcoSystem – Hadoop versus SQL	2	Chalk & Talk	Black Board
UNIT – 3 HADOOP				
3.1	Introduction to Hadoop – Hadoop Overview	4	Chalk & Talk	Green Board
3.2	Hadoop Distributed File System	4	Discussion	Google classroom
3.3	Processing Data with Hadoop	4	Chalk & Talk	Black Board
3.4	Hadoop Ecosystem	2	Chalk & Talk	Black Board
UNIT – 4 MANGODB				
4.1	Introduction to MangoDB – Data Types in MangoDB	4	Discussion	PPT & White board
4.2	Insert method – Save method –	4	Chalk & Talk	Green Board
4.3	adding and removing fields – Array- Aggregate function	4	Chalk & Talk	Black Board
4.4	Cursors in MangoDB	2	Chalk & Talk	Black Board
UNIT – 5 MAPREDUCE & MACHINE LEARNING				
5.1	Mapper – Reducer – Combiner – Practitioner	4	Lecture	PPT & White board

Module No.	Topic	No. of Lectures	Teaching Pedagogy	Teaching Aids
5.2	Searching – Sorting – Machine Learning algorithms:	4	Discussion	PPT & White board
5.3	Regression model – clustering – collaborative filtering	4	Lecture	Black Board
5.4	Association rule mining - decision tree	2	Chalk & Talk	Black Board
UNIT –6 DYNAMISM				
6.1	Advanced Concepts in Big Data Analytics	5	Discussion	Black Board

INTERNAL - UG

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% of Assessment
	T1 10 Mks.	T2 10 Mks.	Quiz 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	5 Mks.	40Mks.	
K1	2	2	-	-	-	4	-	4	10 %
K2	2	2	5	-	-	9	-	9	22.5 %
K3	3	3	-	-	5	11	-	11	27.5 %
K4	3	3	-	5	-	11	-	11	27.5 %

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

End Semester - UG

Levels	Section A (i) 5 Mks.	Section A (ii) 5 Mks	Section B 8 Mks.	Section C 12 Mks	Section D 20 Mks.	Section E 10 Mks.	Total 60Mks.	
K1	5	5	-	4	-	-	14	23.33 %
K2	-	-	8	4	-	-	12	20 %
K3	-	-	-	-	20	-	20	33.33 %
K4	-	-	-	4	-	10	14	23.34 %
Total	5	5	8	12	20	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

UG CIA Components

                                                    Nos

C1 - Test (CIA 1)   1   -   10 Mks

C2 - Test (CIA 2)   1   -   10 Mks

C3 - Assignment   1   -   5 Mks

C4 - Open Book Test/PPT   2 *   -   5 Mks

C5 - Quiz   2 *   -   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	On completion of this course, students will learn big data.	K1, K2	PSO1
CO 2	Understand Big data analytics	K2 & K3	PSO1 &PSO2
CO 3	Analyze data using Hadoop	K2 & K3	PSO3& PSO5
CO 4	Learn and apply different mining algorithms and recommendation systems for large volumes of data.	K2 & K3	PSO2 &PSO3
CO 5	Perform analytics on data streams.	K3& K4	PSO5, PSO7 & PSO8

Mapping of C0s with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6
CO1	3	2	2	3	3	3
CO2	3	3	2	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	2	3	3	3
CO5	3	3	2	3	3	3
Weightage ofcoursecontributedtoeachPSO	15	14	11	15	15	15

Mapping of C0s with POs

CBCS Curriculum for M. Sc Information Technology

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

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

♦WeaklyCorrelated -**1**

COURSE DESIGNER:

1. **Staff Name: Dr. V. JANE VARAMANI SULEKHA**

Forwarded By

V. Mageshwari

HOD'S Signature
& Name

II M.Sc.,

SEMESTER –III

> **Entrepreneurship 100%**

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSIT	19PG3ITSI	SUMMER INTERNSHIP	Practical	-	3

COURSE DESCRIPTION :

It is a summer training programme undertaken by the students in a company of their choice. This is aimed to help them have an experience of the real time environment. It will act as a platform for the future placement.

The students are mandated to complete one online course in the area of their interest.

The students have to submit a report after the internship. This report will be assessed through a viva-voce internal exam.

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	Identify employment contacts leading directly to a full-time job following course completion	K4 & K5	PSO8, PSO9

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED
CO 2	Create communication, interpersonal and other soft skills essential for the job interview process	K4 & K5	PSO8, PSO9
CO 3	Analyse the project requirements and engages in continuing professional development	K4 & K5	PSO8, PSO9
CO 4	Analyze a problem and identify the computing requirements appropriate to its solution.	K4 & K5	PSO8, PSO9
CO 5	Utilizing a new software tool.	K4 & K5	PSO8, PSO9

COURSE DESIGNER:

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II M.Sc.IT

SELF STUDY PAPER

For those who joined in 2021 onwards

Skill Development 100%

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
PSIT	21PG4IT1 6	BIOMETRICS	Lecture	-	4

COURSE DESCRIPTION

Biometrics plays a vital role in Data protection in current scenario.This course facilitates the students to know the basic principles of biometric technology.

COURSE OBJECTIVES

To understand the basic concepts of Biometrics and its applications.

UNITS

UNIT I : INTRODUCTION

How Authentication Technologies Work – How Biometrics Work.

UNIT II: TYPES

Fingerprint and Hand Geometry – Facial and Voice Recognition

UNIT III: EYE BIOMETICS

Eye Biometrics: Iris and Retina Scanning – Signature Recognition and Keystroke Dynamics.

UNIT IV: ESOTERIC BIOMETRICS

Esoteric Biometrics – Features - characteristics

UNIT V: EVALUATION

Biometrics in Large Scale Systems – Biometric Testing and Evaluation.

TEXT BOOK:

1. John D.Woodward, Jr, Nicholas M.Orlans, Peter T. Higgins, **Biometrics – TheUltimate Reference**, Dream Tech Publishers, New Delhi, 2003.

Unit I Chapters - 1, 2

Unit II Chapters - 3, 4

Unit III Chapters - 5, 6

Unit IV Chapters - 7

Unit V Chapters - 9, 11

REFERENCE BOOK:

1. Paul Reid, **Biometrics for Network Security**, Prentice Hall Series in Computer

Networking and Distributed, New Delhi, 2004.

2. James L. Wayman (Editor), Anil Jain (Editor), DavideMaltoni , Dario Maio,

Biometric Systems: Technology, Design and Performance Evaluation, SpringerPublications, London, 2005.

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 enhance the security infrastructure in the industry and generally in information sensitive environments.	K2	PSO1, PSO4
CO 2	To enrich the knowledge about behavioural and physical Biometrics.	K3, K5	PSO5, PSO8
CO 3	To understand how to implement Biometrics in large scale system. .	K2, K3	PSO1, PSO3

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

COURSE DESIGNER:

Staff Name: V. Mageshwari

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& Name

II M.Sc.

SEMESTER IV

| Entrepreneurship |

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEE K	CREDIT S
PSIT	19PG4IT PR	PROJECT	PG Core	-	6

COURSE DESCRIPTION

The project will be of one semester duration. The students will be sent to different organizations involved in IT as per the interest and specialization of students, mostly located in the place of the study. They will have to carry out a project related to the area of interest and submit a project report at the end of the semester. The students shall defend their dissertation in front of a panel of experts during the Viva-Voce examination.

PROJECT PLAN

❖ Facilitates experiential learning
❖ Students are offered career training as part of the curriculum through this Project.
❖ This project work motivates them and also gives insights about Software Development.
❖ Encouraged to do Real time projects.
❖ At the end of the semester the project is evaluated by conducting viva-voce with presentation of the report.

Phase – I

- Students get acceptance letter to do project in any IT company in and around Madurai
- Problem identification in various IT, Academical, Societal, Commercial and Environmental applications
- Requirements gathering and analysis for selecting tool
- Separate modules individually

Phase – II

- Design UI

- Develop programs module level, test and debug individually

Phase – III

- Integrate the modules and show individual DEMO
- Test the app with the users, improve accordingly and conclude the results
- Document the above process as a report

EVALUATION PATTERN

MARKS				
Review 1	Review 2	CIA	ESE	Total
20	20	40	60	100

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	Discuss project development and the associated business processes	K4 & K5	PSO8, PSO9
CO 2	Plan as an individual or in a team in development of technical projects.	K4 & K5	PSO8, PSO9
CO 3	Communicate with engineers and the community at large in written and oral forms.	K4 & K5	PSO8, PSO9
CO 4	Create effective communication skills for presentation	K4 & K5	PSO8, PSO9
CO 5	Analyse problems and formulate solutions	K4 & K5	PSO8, PSO9

COURSE DESIGNER:

    1. **Staff Name**

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                       & Name

II M.Sc.

SEMESTER –III

For those who joined in 2021 onwards

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/W EEK	CREDIT S
PSIT	21PG3ITSL3	RESEARCH METHODOLOGY	SELF STUDY	-	2

COURSE DESCRIPTION:

Research Methodology is a hands-on **course** designed to impart education in the foundational **methods** and techniques of academic **research** in social sciences and business management context.

COURSE OBJECTIVES :

Understand some basic concepts of research and its methodologies.

UNITS

UNIT I : INTRODUCTION TO RESEARCH METHODOLOGY

Definition – History – Evolution of Scientific Inquiry, Scientific Research: Definition,Characteristics, types, need of research.

UNIT II : SCIENCE AND RESEARCH:

Identification of the problem, assessing the status of the problem, formulating the objectives, preparing design.

UNIT   III: TYPES OF RESEARCH

Meaning and importance of Research – Types of Research – Selection and formulation of Research Problem Research Design.

UNIT IV: DATA COLLECTION AND ANALYSIS

UNIT V: SCIENTIFIC WRITING

Types of Report – Technical-Reports and Thesis – Significance – Different steps in the preparation – Illustrations and tables – Bibliography.

TEXT BOOK:

Research Methodology, Dr P M Bulakh,Dr P. S. Patki and Dr A S Chodhary 2010 Published by Expert Trading Corporation Dahisar West, Mumbai 400068.

REFERENCE BOOKS:

1. Kothari, C.R.(2008). Research Methodology: Methods and Techniques. Second Edition. New Age International Publishers, New Delhi.
2. Sinha, S.C. and Dhiman, A.K., 2002. Research Methodology, EssEss Publications. 2 volumes.
3. Gupta S.P. (2008). Statistical Methods. 37 th ed. (Rev)Sultan Chand and Sons. New Delhi. 1470 p.

OPEN EDUCATIONAL RESOURCES:

1.http://www2.ift.ulaval.ca/~chaib/IFT-6001/articles/RMethodology_Marzuki_1.pdf

2.https://gradcoach.com/what-is-research-methodology/

EVALUATION PATTERN

MARKS				
Review 1	Review 2	CIA	ESE	Total
20	20	40	60	100

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	Identify appropriate research topics	K2	PSO3& PSO4
CO 2	Select and define appropriate research problem and parameters	K2, K3	PSO6
CO 3	Prepare a project proposal	K2,K4	PSO3,PSO9
CO 4	Organize and conduct research in a more appropriate manner	K2,K3	PSO3,PSO4
CO 5	Write a research report and thesis and research proposal	K4,K5	PSO7

COURSE DESIGNER:

1.T.LeenaPremaKumari

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HOD'S Signature

& Name

Skill Development 100%

INTER DEPARTMENTAL SELF LEARNING COURSE

DEPARTMENT OF IT AND Commerce with CA

I M.ComCA

SEMESTER –I

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCC	21PGCASLIT1	SUPPLY CHAIN MANAGEMENT	SELF STUDY		2

COURSE OBJECTIVES

To create awareness about the supply chain activities taken in order to deliver the goods

UNIT -I

Supply Chain Management – Global Optimization – importance – key issues – Inventory management – economic lot size model. Supply contracts – centralized vs. decentralized system

UNIT -II

Supply chain Integrates- Push, Pull strategies – Demand driven strategies – Impact on grocery industry – retail industry – distribution strategies

UNIT -III

Strategic Alliances: Frame work for strategic alliances – 3PL – merits and demerits – retailer – supplier partnership – advantages and disadvantages of RSP – distributor Integration

UNIT -IV

Procurement and Outsourcing: Outsourcing – benefits and risks – framework for make/buy decision – e-procurement – frame work of e-procurement

UNIT -V

Dimension of customer Value – conformance of requirement – product selection – price and brand – value added services – strategic pricing – smart pricing – customer value measures

TEXT BOOK:

1. Rushton, A., Oxley, J &Croucher, P, "Handbook of Logistics and Distribution Management", Kogan Page, 2nd Edition , 2007.

REFERENCE BOOKS:

1. Simchi-Levi, David, Kamisnsky, Philip, and Simchi-Levi, Edith, " Designing and Managing the supply chain concepts, strategies and case studies", 3rd Edition, 2008.
2. Irwin, "Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies", McGraw Hill.2006.
3. R.B. Handfield and E.L. Nochols, "Introduction to Supply Chain Management", Prentice Hall, 2006.

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	Explain the recent developments in the Indian financial system.	K2	PSO1,PSO2 & PSO 3
CO 2	Understand the fundamental concepts and working of financial service institutions.	K2, K3	PSO1,PSO2 , PSO3 & PSO 4
CO 3	Illustrate valuation of companies by venture capitalist.	K2, K4	PSO1,PSO2 , PSO 3 & PSO 6

CO 4	provide knowledge about the management of *mutual funds*	K2, K3 & K4	PSO1,PSO2 , & PSO 6
CO 5	Learn about stock market with Basics of Financial Markets	K3& K5	PSO1,PSO3 , & PSO5

COURSE DESIGNER:

1. **Mrs.CharanyaNagammai**
2. **Mrs. N. Jenifer Sharon Sumathi**

Forwarded By

    V. Mageshwari

Head, B.Sc IT Department

Dr. M. Arasammal

Head, B.Com CA Department