FATIMA COLLEGE (AUTONOMOUS)

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

Maryland, Madurai- 625 018, Tamil Nadu, India

NAME OF THE DEPARTMENT   : COMPUTER SCIENCE

NAME OF THE PROGRAMME: M.SC

PROGRAMME CODE   : PSCS

ACADEMIC YEAR   : 2023– 2024

VISION OF THE DEPARTMENT

To be in the Zenith of Scholastic Excellence in Computer Science by imparting Value Based, Skill Based and Career Oriented Education for Holistic Development.

MISSION OF THE DEPARTMENT

- ❖ Empower Women and First generation learners
- ❖ Inculcate lateral thinking and make them professionally competent to meet the global challenge in the field of Computer Science
- ❖ Develop the programming skills of the young learners to meet the current trends of Computer Science
- ❖ Motivate the students to be socially responsible and acquire entrepreneurial skills to become global leaders
- ❖ Promote quality and ethics among the students through Value Based Education

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

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 their strengths and improving on 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 entrepreneurs and 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 discipline 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)

On completion of M.Sc. Computer Science Programme, the learner 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. Computer Science programme, the learner will be able to

PSO 1	Develop professionally competent citizens by applying the scientific knowledge of Computer Science with the ability to think clearly, rationally and creatively to support in evolving solutions to the social/public/scientific issues with responsible democratic participation
PSO 2	Enterprising resourcefulness to identify, plan, formulate, design and evaluate solutions for complex computing problems that address the specific needs with appropriate consideration for Societal, Cultural, Environmental and Industrial domains
PSO 3	Holistic development to ignite the lateral thinking ability in problem solving, acquisition of new skills, open-minded and organized way of facing problems with self awareness and evolving analytical solutions
PSO 4	Create and initiate innovations effectively and communicate efficiently with the computing community and society at large to bridge the gap between computing industry and academia
PSO 5	Through Digital Literacy, understand, assess and commit to professional and ethical principles, norms and responsibilities of the cyber world and the ability for work efficacy as a part of a team and engage effectively with diverse stakeholders
PSO 6	Ability and willingness to embark on new ventures and initiatives with critical thinking and desire for more continuous learning focusing on life skills
PSO 7	Use research-based knowledge and research methods to design, analyse, and interpret data and to synthesize information to provide valid findings to serve community

FATIMA COLLEGE (AUTONOMOUS), MADURAI-18

DEPARTMENT OF COMPUTER SCIENCE

For those who joined in June 2023 onwards

MAJOR CORE – 60 CREDITS

PROGRAMME CODE:PSCS

S. No	SEM.	COURSE CODE	COURSE TITLE	H RS	CRE DITS	CIA Mks	ESE Mks	TOT. MKs
1.	I	23PG1B1	Core – I :Analysis& Design of Algorithms	6	5	40	60	100
2.		23PG1B2	Core – II : Python Programming	6	5	40	60	100
3.		23PG1B3	Core - III: Python Programming Lab	6	4	40	60	100
4.		23PG1BE1 23PG1BE2	**Elective I:** Advanced Software Engineering Advanced Computer Graphics	5	3	40	60	100
5.		23PG1BE3 23PG1BE4	**Elective II** Advanced Database Systems Object Oriented Analysis and Design & C++	5	3	40	60	100
6.		23PG1BAE	Web Development	2	1	40	60	100
			TOTAL	**30**	**21**			
7.	II	23PG2B4	Core –IV : Advanced Java Programming	6	5	40	60	100
8.		23PG2B5	Core – V: Data Mining and Warehousing	6	5	40	60	100
9.		23PG2B6	Core – VI : AdvancedJava Programming Lab	6	4	40	60	100
10.		23PG2BE5 23PG2BE6	**Elective - III :** Data Mining Lab using R Operating System Lab	4	3	40	60	100
11.		23PG2BE7 23PG2BE8	**Elective –IV :** Advanced Operating System Multimedia Technologies	4	3	40	60	100

S. No		COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks
12.		23PG2BAE	WEB Designing using CSS & JavaScript	4	2	40	60	100
			TOTAL	**30**	**22**			

S. No	SEM.	COURSE CODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks
13.		22PG3B12	Machine Learning	5	5	40	60
14.		19PG3B13	Data Mining and Data Warehousing	5	5	40	60
15.	III	22PG3B14	Lab V – Machine Learning Lab with Python	5	3	40	60
16.		19PG3B15	Lab VI – Data Mining And Data Warehousing	5	3	40	60
17.	IV	19PG4B16	Principles Of Internet Of Things (Self Study)	-	4	40	60

MAJOR ELECTIVE / EXTRA DEPARTMENTAL COURSE / INTERNSHIP/ PROJECT

S. No	SEM.	COURSECODE	COURSE TITLE	HRS	CREDITS	CIA Mks	ESE Mks	TOT. Mks
1.		19PG3BE5	PYTHON PROGRAMMING	5	5	40	60	100
2.		19PG3BE6	CRYPTOGRAPHY AND NETWORK SECURITY	5	5	40	60	100
3.		19PG3BE7	DISTRIBUTED DATABASE MANAGEMENT SYSTEM	5	5	40	60	100
4.	III	19PG3BE8	COMPILER DESIGN	5	5	40	60	100
5.		19PG3BE9	CLOUD COMPUTING	5	5	40	60	100
6.		19PG3BE10	ADVANCED COMPUTER GRAPHICS & ANIMATION	5	5	40	60	100
7.		19PG3BE11	BIG DATA ANALYTICS	5	5	40	60	100
8.		19PG3BE12	CYBER FORENSICS	5	5	40	60	100
9.		19PG3BE13	MOBILE COMMUNICATION	5	5	40	60	100

| 10. | | 19PG3BSI | SUMMER INTERNSHIP/ TRAINING/ ONLINE CERTIFICATION | - | 3 | 40 | 60 | 100 |
| 11. | IV | 19PG4BPR | PROJECT | - | 6 | 40 | 60 | 100 |

EXTRA CREDIT COURSES

Course Code	Courses	Hrs.	Credits	Semester in which the course is offered	CIA Mks	ESE Mks	Total Marks
19PGBSL1	**SELF LEARNING COURSE for ADVANCED LEARNERS** BIOINFORMATICS	-	5	III & IV	40	60	100
21PGBSL2	**SELF LEARNING COURSE for ADVANCED LEARNERS** DEVELOPING WEB SERVICES	-	5	III & IV	40	60	100
21PGBSL3	**SELF LEARNING COURSES for ADVANCED LEARNERS** EVOLUTIONARY COMPUTING	-	5	III & IV	40	60	100
	MOOC COURSES (Department Specific Courses) * Students can opt other than the listed course from UGC-SWAYAM portal as well as from NPTEL	-	Respective Credits allotted by UGC	-	-	-	100

OFF-CLASS PROGRAMMES
ADD-ON COURSES

COURSE CODE	COURSES	HRS.	CREDITS	SEMESTER IN WHICH THE COURSE IS OFFERED
23PAD1SS	**SOFT SKILLS**	40	3	I
23PAD2CS	**Cyber Security**	Online	1	I and II
23PADAJ	**Scripting using Angular JS** (Offered by Dept. Of Computer Science)	40	2	II
23PAD4CV	**COMPREHENSIVE VIVA** (Question bank to be prepared for all the papers by the respective course teachers)	-	2	IV
23PAD4RC	**READING CULTURE**	20/ Year	2	I - IV

I M.Sc. Computer Science
SEMESTER –I
For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG1B1	ANALYSIS AND DESIGN OF ALGORITHMS	CORE	6	5

COURSE DESCRIPTION

This course explains many algorithms and how to solve various problems using same or different kind of algorithms with efficient manner.

COURSE OBJECTIVES

- To stress the importance of the efficiency in writing programs
- To write algorithms efficient in terms of design and time complexity

UNITS

UNIT I : INTRODUCTION (18 hrs)

Introduction: - Algorithm Definition and Specification – Space complexity-Time Complexity- Asymptotic Notations - Elementary Data Structure: Stacks and Queues – Binary Tree - Binary Search Tree - Heap – Heap sort- Graph.

UNIT II : TRAVERSAL AND SEARCH TECHNIQUES (18 hrs)

Basic Traversal And Search Techniques: Techniques for Binary Trees-Techniques for Graphs -Divide and Conquer: - General Method – Binary Search – Merge Sort – Quick Sort.

UNIT III : GREEDY METHOD (18 hrs)

The Greedy Method:- General Method–Knapsack Problem– Minimum Cost Spanning Tree– Single Source Shortest Path.

UNIT IV : DYNAMIC PROGRAMMING (18 hrs)

Dynamic Programming – General Method – Multistage Graphs –All Pair Shortest Path – Optimal Binary Search Trees – 0/1 Knapsacks – Travelling Salesman Problem – Flow Shop Scheduling.

UNIT V : BACKTRACKING (16 hrs)

Backtracking:- General Method–8-Queens Problem–Sum Of Subsets–Graph Coloring– Hamiltonian Cycles – Branch And Bound: - The Method – Travelling Salesperson.

UNIT VI : CONTEMPORARY ISSUES (2 hrs)
Expert lectures, online seminars – webinars

SELF STUDY:

UNIT II

TEXT BOOK

1. Computer Algorithms, EllisHorowitz, Galgotia Publications.
2. Data Structures and Algorithms, Alfred V.Aho, JohnE. Hopcroft, JeffreyD.Ullman.

REFERENCES:
1. Data Structures & Algorithms in Java, *Goodrich, Wiley 3rd edition.*
2. The Algorithm Design Manual, *Skiena, Second Edition, Springer, 2008.*
3. Introduction to the Design and Analysis of algorithm, *Anany Levith, Pearson Education Asia, 2003.*
4. An Introduction to the Analysis of Algorithms, *Robert Sedgewick,Phillipe Flajolet, Addison-Wesley Publishing Company, 1996.*

Digital Open Educational Resources (DOER)

1. https://nptel.ac.in/courses/106/106/106106131/
2. https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm
3. https://www.javatpoint.com/daa-tutorial

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

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

C1 – Conducted for 30 marks and converted into 10 marks

COURSE OUTCOMES (CO)

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED	POs ADDRESSED
CO 1	Get knowledge about algorithms and determines their time complexity. Demonstrate specific search and sort algorithms using divide and conquer technique.	K3/K4	PSO1& PSO2	PO3
CO 2	Gain good understanding of Greedy method and its algorithm.	K1/K2	PSO3& PSO4	PO2
CO 3	Able to describe about graphs using dynamic programming technique.	K3/K4	PSO5	PO1
CO 4	Demonstrate the concept of back tracking & branch and bound technique.	K3/K4	PSO6	PO4
CO 5	Explore the traversal and searching technique and apply it for trees and graphs.	K1/K2	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	1	2	2	2	2	2	2
CO2	2	2	2	1	2	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	2	2	2
CO5	2	2	2	2	2	1	3

Mapping COs Consistency with POs

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

Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**
COURSE DESIGNER:
Dr.S.Arul Jothi

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG1B2	PYTHON PROGRAMMING	CORE	6	5

COURSE DESCRIPTION

Python is an interpreted, high-level, general-purpose programming language. it provides constructs that enable clear programming on both small and large scales

COURSE OBJECTIVES

● Presents an introduction to Python, creation of web applications, network applications and working in the clouds

● Use functions for structuring Python programs

● Understand different Data Structures of Python

● Represent compound data using Python lists, tuples and dictionaries

UNITS

UNIT I: INTRODUCTION   (18 HRS)
Python:
Introduction–Numbers–Strings–Variables–Lists–Tuples–Dictionaries–Sets–Comparison.

Unit II: CODE STRUCTURES   (18 HRS)
Code Structures: if, elseif, and else – Repeat with while – Iterate with for – Comprehensions – Functions – Generators – Decorators – Namespaces and Scope – Handle Errors with try and except – User Exceptions.

Unit III: MODULES, PACKAGES AND CLASSES   (18 HRS)
Modules, Packages, and Programs: Standalone Programs – Command-Line Arguments – Modules and the import Statement – The Python Standard Library.
Objects and Classes: Define a Class with class – Inheritance – Override a Method – Add a Method – Get Help from Parent with super – In self Defense –Get and Set Attribute Values with Properties –Name Mangling for Privacy – Method Types – Duck Typing – Special Methods –Composition.

Unit IV: DATA TYPES AND WEB   (18 HRS)
Data Types: Text Strings–Binary Data.
Storing and Retrieving Data: File Input/Output– Structured Text Files – Structured Binary Files - Relational Databases – No SQL Data Stores.

Unit V: SYSTEMS AND NETWORKS   (16 HRS)
Web: Web Clients –Web Servers

Systems: Files–Directories–Programs and Processes–Calendars and Clocks.
Concurrency: Queues– Processes–Threads

UNIT VI : CONTEMPORARY ISSUES   (2 hrs)
Expert lectures, online seminars – webinars

SELF STUDY:
Unit 4: Data Types: Text Strings–Binary Data.
Unit 5: Web: Web Clients –Web Servers

Text Books:

- Bill Lubanovic, "Introducing Python", O'Reilly, First Edition-Second Release, 2014.
Chapter : 2,3,4,5,6,7,8, 9 (Pg.no : 223 – 242) ,10, 11 (Pg.no : 267 – 273)

Reference Books:
- David M.   Beazley, "Python Essential Edition,2009. Reference", Developer's Library,   Fourth
- Sheetal Taneja, Naveen Kumar, Approach, Pearson Publications. "Python   Programming-A   Modular

Digital Open Educational Resources (DOER)

- https://www.programiz.com/python-programming/
- https://www.tutorialspoint.com/python/index.htm
- https://onlinecourses.swayam2.ac.in/aic20_sp33/preview

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**,** **K2-**Understand**,** **K3-**Apply**,** **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Understand the basic concepts of Python Programming	K3/K4	PSO1& PSO2	PO1
CO 2	Understand File operations, Classes and Objects	K1/K2	PSO3& PSO4	PO2
CO 3	Acquire Object Oriented Skills in Python	K3/K4	PSO5	PO4
CO 4	Develop web applications using Python	K3/K4	PSO6	PO2
CO 5	Develop Client Server Networking applications	K1/K2	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	1	2	2	2	2	2	2
CO2	2	2	2	1	2	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	2	2	2
CO5	2	2	2	2	2	1	3

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:
Dr.P.Meenakshi Sundari

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science
SEMESTER –I

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDIT S
PSCS	23PG1B3	**PYTHON PROGRAMMIN G LAB**	CORE	6	4

COURSE DESCRIPTION

The objective of the course is to develop knowledge and skills on python programming

COURSE OBJECTIVES

- This course presents an overview of elementary data items, lists, dictionaries, sets and tuples
- To understand and write simple Python programs
- To Understand the OOPS concepts of Python
- To develop web applications using Python

LIST OF PROGRAMS   75hours
Implement the following in Python:
1.   Programs using elementary data items, lists, dictionaries and tuples
2.   Programs using conditional branches
3.   Programs using loops.
4.   Programs using functions
5.   Programs using exception handling
6.   Programs using inheritance
7.   Programs using polymorphism
8.   Programs to implement file operations.
9.   Programs using modules.
10.   Programs for creating dynamic and interactive web pages using forms.

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**,   K2-**Understand**,   K3-**Apply**,   K4-**Analyse, **K5-**

Synthesis

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
25	10	5	40	60	100

C1 – Average of Two Monthly Tests

C2 – Average of Weekly Tests

C3 – Non – Scholastic

COURSE OUTCOME (CO)				
NO.	**COURSE OUTCOME**	**KNOWLEDGE LEVEL (ACCORDING TO BLOOM'S TAXONOMY)**	**PSOS ADDRESSED**	**POS ADDRESSED**
CO 1	To know the basics of algorithmic problem solving	K3	PSO1& PSO2	PO1
CO 2	To execute Python programs	K4	PSO3& PSO4	PO2
CO 3	To develop algorithmic solutions to simple computational problems	K3,K4	PSO5	PO3
CO 4	To represent compound data using Python lists, tuples, dictionaries	K3,K4	PSO6	PO3
CO 5	To implement input/output with files in Python	K4	PSO7	PO4

Mapping COs Consistency with PSOs							
CO/ PSO	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**	**PSO6**	**PSO7**

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

Mapping of COs with POs

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

Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**
COURSE DESIGNER:
Dr.P.Meenakshi Sundari

Forwarded By

(Dr.S.Vidya)

HOD'S Signature & Name

I M.Sc. Computer Science

SEMESTER –I

For those who joined in 2023 onwards

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDIT S
PSCS	23PG1BE 1	ADVANCED SOFTWARE ENGINEERING	ELECTIVE	5	3

COURSE DESCRIPTION

Object Oriented software Engineering provides object oriented programming techniques. And explains various object oriented development cycles with appropriate testing methods. And gives how to design and construct modular, reusable, extensible and portable object-oriented software.

COURSE OBJECTIVES

The main objectives of this course are to:
1.   Introduce to Software Engineering, Design, Testing and Maintenance.
2.   Enable the students to learn the concepts of Software Engineering.
3.   Learn about Software Project Management, Software Design & Testing.

UNITS

UNIT I : INTRODUCTION   (15 Hrs)

Introduction: The Problem Domain – Software Engineering Challenges - Software Engineering Approach – Software Processes: Software Process – Characteristics of a Software Process – Software Development Process Models – Other software processes.

Unit:2   SOFTWARE REQUIREMENTS   (15 Hrs)

Software Requirements Analysis and Specification : Requirement engineering – Type of Requirements – Feasibility Studies – Requirements Elicitation – Requirement Analysis – Requirement Documentation – Requirement Validation – Requirement Management – SRS - Formal System Specification – Axiomatic Specification – Algebraic Specification - Case study: Student Result management system. Software Quality Management –Software Quality, Software Quality Management System, ISO 9000, SEI CMM.

Unit:3   PROJECT MANAGEMENT   (15 Hrs)

Software Project Management: Responsibilities of a software project manager – Project planning – Metrics for Project size estimation – Project Estimation Techniques – Empirical Estimation Techniques – COCOMO – Halstead's software science – Staffing level estimation – Scheduling– Organization and Team Structures – Staffing – Risk management – Software Configuration Management – Miscellaneous Plan.

Unit:4   SOFTWARE DESIGN   (15 Hrs)

Software Design: Outcome of a Design process – Characteristics of a good software design – Cohesion and coupling - Strategy of Design – Function Oriented Design – Object Oriented Design - Detailed Design - IEEE Recommended Practice for Software Design Descriptions.

Unit:5   SOFTWARE TESTING   (13 Hrs)

Software Testing: A Strategic approach to software testing – Terminologies – Functional testing– Structural testing – Levels of testing – Validation testing - Regression testing – Art of Debugging–Testingtools-Metrics-ReliabilityEstimation.SoftwareMaintenance -Maintenance Process - Reverse Engineering – Software Re-engineering - Configuration Management Activities.

Unit:6   Contemporary Issues   (2 Hrs)

Expert lectures, online seminars –webinars

Text Books

1. An Integrated Approach to Software Engineering– Pankaj Jalote, Narosa Publishing House, Delhi, 3rd Edition.
2. Fundamentals of Software Engineering –Rajib Mall, PHI Publication, 3rd Edition.

Reference Books

1. Software Engineering –K. K. Aggarwaland Yogesh Singh, New Age International Publishers, 3rd edition.
2. A Practitioners Approach – Software Engineering- R.S.Pressman, McGraw Hill.
3. Fundamentals of   Software   Engineering-Carlo Ghezzi, M.Jarayeri, D.Manodrioli, PHI Publication.

Digital Open Educational

- **https://www.javatpoint.com/software-engineering-tutorial**
- **https://onlinecourses.swayam2.ac.in/cec20_cs07/preview**
- **https://onlinecourses.nptel.ac.in/noc19_cs69/preview**

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse,
K5-Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Understand about Software Engineering process	K2	PSO1& PSO2	PO2
CO 2	Understand about Software project management skills , design and quality management	K2, K3	PSO3& PSO4	PO3
CO 3	Analyze on Software Requirements and Specification	K2, K4	PSO5	PO4
CO 4	Analyze on Software Testing, Maintenance and Software Re-Engineering	K2, K3 & K4	PSO6	PO4
CO 5	Design and conduct various types and levels of software quality for a software project	K3& K5	PSO7	PO5

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	2	2	2	3	2	2
CO2	1	1	3	2	2	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	2	2	1
CO5	2	2	2	2	2	1	2

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:
Sr.Margaret Mary

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG1BE2	ADVANCED COMPUTER GRAPHICS	ELECTIVE	5	3

COURSE DESCRIPTION

To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.

COURSE OBJECTIVES

- To understand the basics of geometry processing.
- To understand the fundamentals of pipelined rasterization rendering of meshed objects and curved surfaces.
- To understand and work with advanced rendering methods such as radiosity.
- To design programs for advanced animation methods and
- To become proficient at graphics programming using OpenGL

UNITS

UNIT I: Output Primitive Of Attributes   (15 Hrs)

Points and Lines – Line-drawing algorithms – Loading the frame buffer – Line function – Circle-generating algorithms – Ellipse-generating algorithms – Other curves – Parallel curve algorithms – Curve functions – Pixel addressing – Filled-area primitives – Line attributes – Curve attributes – Color and grayscale levels – Area-fill attributes – Character attributes.

UNIT II: Two-Dimensional Geometric Transformations   (15 Hrs)

Basic Transformations – Matrix representations – Composite transformations – Other transformations – Transformations between coordinate systems.

UNIT III: Two-Dimensional Viewing   (15 Hrs)

The viewing pipeline – Viewing coordinate reference frame – Window-to-viewport coordinate transformation - Two-Dimensional viewing functions – Clipping operations – Point clipping – Line clipping – Polygon clipping – Curve clipping – Text clipping.

UNIT IV: Introduction To Animation, Interpolation   (15 Hrs)

Perception – The heritage of animation – Animation production – Computer Animation production – A Brief history of computer animation – Interpolation – Controlling the motion of a point – Interpolation of orientations.

UNIT V: Interpolation-Based Animation   (15 Hrs)

Key-frame systems – Animation languages – Deforming objects – Morphing.

SELF STUDY:

UNIT I: Output Primitive: Color& grayscale levels, Area-fill attributes, Character attributes.

UNIT II: Two-Dimensional Geometric Transformations : Basic Transformations– Matrix representations

UNIT III: Two-Dimensional Viewing Window-to-viewport coordinate transformation

UNIT IV: Introduction To Animation, Interpolation : Controlling the motion of a point.

UNIT V: Interpolation-Based Animation: Deforming objects

TEXT BOOKS

1. **Computer Graphics**, Donald D. Hearn, M. Pauline Baker, 4th Edition, Pearson Education Publication, 2014.

Chapters: 3.1 – 3.11, 4.1 – 4.5, 5.1 – 5.5, 6.1 – 6.10

2. **Computer Animation-Algorithms and Techniques**, Rick Parent, Morgan Kaufman Publishers, 2ndEdition, 2009.

Chapters: 1, 3.1 – 3.2, 4.1 – 4.3,4.5

REFERENCES:

1. **Computer Graphics, Multimedia and Animation**, Malay K.Pakhira, 2nd Edition, PHI Learning Pvt. Ltd., 2010.
2. **Interactive Computer Graphics: A top-down approach with OpenGL**, Edward Angel and Dave Shreiner,   6th Edition, Addison Wesley, 2012.
3. **Computer Graphics Principles and Practice**, Foley, Van Dam, Feiner, Hughes, 3rd Edition, C. Addison   Wesley, 2014.

Digital Open Educational Resources (DOER)

1. https://en.wikipedia.org/wiki/Computer_graphics
2. http://what-when-how.com/advanced-methods-in-computer-graphics/introduction-to-advanced-methods-in-computer-graphics/
3. https://inst.eecs.berkeley.edu/~cs294-13/fa09/

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholas	CIA Total	

	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	tic Marks C6 5 Mks.	40Mks.	% of Assessment
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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

C1 – Conducted for 30 marks and converted into 10 marks

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Explain the basic concepts in computer graphics.	K2	PSO1& PSO2	PO1
CO 2	Analyze various algorithms and to convert the basic geometrical primitives.	K2, K3	PSO3& PSO4	PO2
CO 3	Demonstrate the importance of viewing and clipping.	K2, K4	PSO5	PO4
CO 4	Discuss the fundamentals of animation	K2, K3 & K4	PSO6	PO2
CO 5	Describe Interpolation-Based Animation	K3& K5	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	2
CO2	1	1	3	3	1	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	1	3	1
CO5	2	2	2	2	1	1	3

Mapping COs Consistency with POs

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

Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**
COURSE DESIGNER:
Dr.S.Arul Jothi

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science
SEMESTER –I
For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG1BE3	ADVANCED DATABASE SYSTEMS	Elective	5	3

COURSE DESCRIPTION

Advanced Database System Concepts provides in-depth level knowledge of SQL for design of relational Database and process the data using PL/SQL. It also facilitates the students to acquire the knowledge of different types of Databases.

COURSE OBJECTIVES

- To understand intermediate and advanced SQL.
- To learn different types of normalisation techniques and Transaction Mechanism
- To learn Parallel and Distributed Data Bases.

UNITS

UNIT I: INTRODUCTION TO SQL   (15 HRS)

Overview of the SQL Query Language - SQL Data Definition - Basic Structure of SQL Queries - Additional Basic Operations - Set Operations - Null Values Aggregate Functions - Nested Sub queries -Modification of the Database.
INTERMEDIATE SQL: Join Expressions -Views -Transactions -Integrity Constraints -SQL Data Types and Schemas - Authorization.

UNIT II: ADVANCED SQL: (15 HRS)

Accessing SQL From a Programming Language -Functions and Procedures -Triggers -Recursive Queries-Advanced Aggregation Features, OLAP.

UNIT III: RELATIONAL DATABASE DESIGN :   (15 HRS)

Features of Good Relational Designs - Atomic Domains and First Normal Form -Decomposition Using Functional Dependencies - Functional-Dependency Theory - Algorithms for Decomposition .

UNIT IV: TRANSACTION: (15 HRS)

Transaction Concept - A Simple Transaction Model - Storage Structure - Transaction Atomicity and Durability - Transaction Isolation - Serializability -Transaction Isolation and Atomicity -Transaction Isolation Levels - Implementation of Isolation Levels - Transactions as SQL Statements

UNIT V: PARALLEL AND DISTRIBUTED DATABASES   (15 HRS)

Introduction   -I/O   Parallelism -Interquery Parallelism -Intraquery Parallelism -Intraoperation Parallelism -Interoperation Parallelism.
Distributed Databases : Homogeneous and Heterogeneous Databases

-Distributed Data Storage -Distributed Transactions -Commit Protocols - Concurrency Control in Distributed Databases .

.

SELF STUDY:

UNIT V:

TEXT BOOK

1. Database System Concepts-— 6th ed. ,Abraham Silberschatz, Henry F. Korth S. Sudarshan, McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY 10020. Copyright © 2011

Chapter: 3, 4, 5, 8.1-8.5, 14, 18.1- 18.6, 19.1 -19.5

REFERENCES:

1. Database Management Systems,*by RaghRamakrishnan and   Johannes Gehrke ,* 3rd *Edition* , McGraw Hill Education,2014

2. **Database system Concepts**, Abraham silberschatz, Henry F.Korth, S.Sudharshan, MGH, 6th Edition, 2013.

3. **Fundamentals of Database System,** RamezElmasri, Shamkant B. Navathe, Pearson Education Publications, 6th Edition, 2017

Digital Open Educational Resources (DOER)

1) https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/
2) https://www.bmc.com/blogs/dbms-database-management-systems/
3) https://www.tutorialspoint.com/dbms/index.htm

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks	CIA Total	% of Assessment

	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	C6 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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse**,
K5-Synthesis

EVALUATION PATTERN		
SCHOLASTIC	NON - SCHOLASTIC	MARKS

C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	40	60	100

C1 – Conducted for 30 marks and converted into 10 marks

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Demonstrate Database operations using SQL Procedures Functions and Triggers	K3/K4	PSO1& PSO2	PO1
CO 2	Identify approaches for accessing SQL from general purpose Programming Languages.	K1/K2	PSO3& PSO4	PO2
CO 3	Analyse different types of Normalisation techniques.	K3/K4	PSO5	PO4
CO 4	Apply the concepts of Transaction Mechanism using PL/SQL	K3/K4	PSO6	PO2
CO 5	Understand the concept of Parallel and Distributed Databases.	K1/K2	PSO7	PO3

Mapping COs Consistency with PSOs

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

Mapping COs Consistency with POs

CO/PO	PO1	PO2	PO3	PO4
CO1	1	2	2	2

CO2	2	3	2	2
CO3	3	2	2	2
CO4	2	2	1	2
CO5	2	2	2	1

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

COURSE DESIGNER:
Dr.T.Vasantha

Forwarded By

(Dr.S.Vidya)

HOD'S Signature & Name

I M.Sc. Computer Science

SEMESTER –I

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG1BE4	OBJECT ORIENTED ANALYSIS AND DESIGN & C++	ELECTIVE	5	3

COURSE DESCRIPTION

This course helps to provide the fundamental knowledge of a programming language and its features which enhances the user to write general purpose application programs..

COURSE OBJECTIVES

The main objectives of this course are to:

1. Present the object model, classes and objects, object orientation, machine view and model management view.
2. Enables the students to learn the basic functions, principles and concepts of object oriented analysis and design.
3. Enable the students to understand C++ language with respect to OOAD

UNITS

Unit:1 OBJECTMODEL (15 Hrs)

The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationship among Objects.

Unit:2 CLASSES AND OBJECTS (15 Hrs)

Classes and Object: Nature of Class – Relationship Among classes – The Interplay of classes and Objects. Classification: The importance of Proper Classification –identifying classes and objects –Key Abstractions and Mechanism.

Unit:3 C++ INTRODUCTION (15 Hrs)

Introduction to C++- Input and output statements in C++-Declarations-control structures – Functions in C++.

Unit:4 INHERITANCE AND OVERLOADING (13 Hrs)

Classes and Objects– Constructors and Destructors–operators overloading–Type Conversion- Inheritance – Pointers and Arrays.

Unit:5 POLYMORPHISM AND FILES (15 Hrs)

MemoryManagementOperators-Polymorphism–Virtualfunctions–Files–Exception Handling – String Handling -Templates.

Unit:6   Contemporary Issues   (2 Hrs) Expert
lectures, online seminars – webinars

TEXT BOOKS

"Object Oriented Analysis and Design with Applications", Grady Booch, Second Edition, Pearson Education.

"Object-Oriented Programming with ANSI & TurboC++", Ashok N.Kamthane, First Indian Print -2003, Pearson Education.

Reference Books

Balagurusamy "Object Oriented Programming with C++", TMH, Second Edition, 2003.

Digital Open Educational Resources (DOER)

- https://onlinecourses.nptel.ac.in/noc19_cs48/preview
- https://nptel.ac.in/noc/courses/noc16/SEM2/noc16-cs19/
- https://www.tutorialspoint.com/object_oriented_analysis_design/ooad_object_oriented_analysis.htm

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholas	CIA Total	

	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	tic Marks C6 5 Mks.	40Mks.	% of Assessment
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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

C1 – Conducted for 30 marks and converted into 10 marks

COURSE OUTCOMES (CO)				
NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED	POs ADDRESSED
CO 1	Understand the concept of Object-Oriented development and modelling techniques	K2,K3	PSO1& PSO2	PO1
CO 2	Gain knowledge about the various steps performed during object design	K2,K3	PSO3& PSO4	PO2
CO 3	Abstract object-based views for generic software systems	K3,K4	PSO2 &PSO5	PO3
CO 4	Link OOAD with C++ language	K4,K5	PSO6 &PSO7	PO2 & PO3
CO 5	Apply the basic concept of OOPs and familiarize to write C++ program	K3,K5	PSO1 &PSO3	PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	1	1	2	2	2	3
CO2	2	2	3	2	3	2	2
CO3	2	3	2	2	2	2	2
CO4	2	2	2	2	2	3	3
CO5	3	2	3	1	2	1	1

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:
Dr.T.Vasantha

Forwarded By

(Dr.S.Vidya)

HOD'S Signature & Name

I M.Sc. Computer Science
SEMESTER –I
For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	23PG1BAE	WEB DEVELOPMENT	Ability Enhancement Course	2	1

COURSE DESCRIPTION

This Course introduces basic web design using Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS). And this course provides knowledge to plan and design effective web pages with different text formatting and images to create websites.

COURSE OBJECTIVES

- To enhance the knowledge of the students in effective webpage designing.
- To provide skills to sharply focus on needed information to be presented in a website.
- To improve the quality of the students by giving a strong base in fundamental and advanced concepts.
- To give courage to face the real-world scenarios as it is practical oriented
- To inculcate the ability to explain, analyze, identify and define the technology required to build and implement a web site.

UNITS

UNIT I: OVERVIEW OF HTML   (6 Hrs)
Fundamentals of HTML - Root Elements-Metadata Elements- Section Elements-Heading Elements-Flow Elements- Phrasing Elements- Embedded Elements- Interactive Elements –Working with Headings-Character Entities – Horizontal Rules – Line Breaks – Paragraph – Citations – Quotations – Definitions - Comments.

UNIT II: WORKING WITH TEXT   (6   Hrs)
Working with Text - Formatting Text with HTML Elements – Physical styles – Logical styles – Defining the MARK Element- Defining the STRONG Element- Defining the CODE Element- Defining the SMALL Element.

UNIT III: ORGANIZING TEXT   (6 Hrs)
Organizing Text in HTML -Arranging text – Allowing Word Breaks- Defining

the preformatted Text - DIV Element and SPAN Element – Formatting Text in Tables - Creating Ruby (Captioned) Text – Displaying List-Immediate Solutions : Allowing Word Breaks Using the WBR Element – Displaying The Preformatted Text – Using the DIV Element - Positionaing Text Using the DIV Element – Using the SPAN Element – Formatting Text Using Tables – Creating the Ruby Text – Creating Lists.

UNIT IV: CREATING TABLES   (6 Hrs)

Creating Tables - Understanding Tables – Describing the TABLE Elements – CAPTION –COLGROUP – COL – TBODY – THEAD – TFOOT – TR – TD and TH - Creating a Simple Table – Adding a Title to a Table – Caption to a Table – Specifying the Properties of the Columns – Spanning Rows and Columns – Using Images in a Table.

UNIT V: UNDERSTANDING CSS   (6 Hrs)

Overview of CSS – Discussing the Evolution of CSS – Understanding the Syntax of CSS – Exploring CSS Selectors – Inserting CSS in an HTML Document.

SELF STUDY:

UNIT I: Working with Headings-Character Entities – Horizontal Rules – Line Breaks – Paragraph – Citations – Quotations – Definitions - Comments

UNIT III: Arranging text – Allowing Word Breaks- Defining the preformatted Text - DIV Element and SPAN Element – Formatting Text in Tables - Creating Ruby (Captioned) Text

UNIT IV: Adding a Title to a Table – Caption to a Table – Specifying the Properties of the Columns

TEXT BOOK

HTML5 Black Book, Kogent Learning Solutions Inc., Dreamtech Press, 2012.

Chapters (Page Numbers) : 2(31-50 & 68-76) ; 3(77-94); 4(113-128) ; 6 (145-164) ; 18 (465-476)

REFERENCES

1. ***Sergey's HTML5 & CSS3 Quick Reference: Color Edition,*** Sergey Mavrody, Published 16 Nov 2009.
2. ***HTML5: The Missing Manual,*** Matthew MacDonald,Published in 2011.
3. ***Head First HTML5 Programming: Building Web Apps with JavaScript,*** Elisabeth Freeman and Eric Freeman, Published in 2011.
4. ***Beginning HTML5 and CSS3 For Dummies,*** Chris Minnick and Ed Tittel, Published 2013.

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/html5/index.htm
2. https://www.w3schools.com/html/default.asp
3. https://www.tutorialrepublic.com/html-tutorial/
4. https://www.cs.uct.ac.za/mit_notes/web_programming.html

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Define various tags of HTML	K1	PSO1& PSO2	PO1
CO 2	Design a web page with attractive display	K3	PSO3& PSO7	PO2
CO 3	Create a Layout for a webpage using Block tags	K3	PSO4	PO4
CO 4	Explain how and where to apply CSS	K3	PSO6	PO3
CO 5	Analyze content to design website	K4	PSO5	PO4

Mapping COs Consistency with PSOs

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

Mapping COs Consistency with POs				

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

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

Dr.S.Arul jothi

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science
SEMESTER –II
For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG2B4	**ADVANCED JAVA PROGRAMMI NG**	CORE	6	5

COURSE DESCRIPTION

Advanced Programming in Java consists of Networking concepts, GUI Programming with Swing and Swing Menus, JDBC and JSP.

COURSE OBJECTIVES

- To understand the Networking concept using TCP/IP and RMI.
- To design and develop java program using Swings Components.
- To implement Server Side Program with Servlets.
- To understand   and develop java program using JSP.

UNITS

UNIT I: NETWORKING **(18 Hrs)**
Networking: Networking Basics – The Networking Classes and Interfaces – Inet Address – Inet4Address and Inet6Address - TCP/IP Client Sockets – URL – URL Connection – HttpURLConnection – The URI Class – Cookies – TCP/IP Server Sockets – Datagrams. Regular Expressions and other Packages: The Core Java API Packages - Regular Expression Processing – Reflection – RMI.

UNIT II: SWINGS **(18 Hrs)**
GUI Programming with Swing: Introducing Swing – Two key swing features – The MVG Connection – Components and Containers – Swing Packages – Event Handling – Swing Applet – Painting in Swing.
Exploring Swing: JLabel and ImageIcon – JTextField – The Swing Buttons – JTabbedPane – JScrollPane – JList – JComboBox – Trees – JTable.

UNIT III: SWING MENUS **(18 Hrs)**
Swing Menus: Menu Basics – Overview of JMenuBar, JMenu, and JMenuItem – Create a Main Menu – Add Mnemonics and Accelerators to Menu Items – Add Images and Tooltips to Menu Items – Use JRadioButtonMenuItem and JCheckBoxMenuItem – Create a Popup Menu – Create a Toolbar – Use Actions – Entire MenuDemo Program Together.

UNIT IV: JDBC **(18 Hrs)**
JDBC- Java Database Connectivity: Introducing JDBC Driver Types -

Creating Your First First JDBC Program – Performing Batch Updates – Using Save points - Configuring the JDBC-ODBC Bridge- Explaining Database Connection pools and data sources-Revisiting DBProcessor-Using the RowSet Interface. Servlets: The Life Cycle of a Servlet – Servlet Development Options – Using Tomcat – Simple Servlet – The Servlet API – The javax.servlet Package – Reading Servlet Parameters – The javax.servlet.http Package – Handling HTTP Requests and Responses – Using Cookies – Session Tracking.

UNIT V: JSP **(18 Hrs)**

JSP: Introducing JSP – Examining MVC and JSP - JSP Scripting Elements and Directives –Working with Variable Scopes – Error pages – Using java Beans – Designing an online Store with JSP – Simple programs using JSP. Using JSP Tag Extensions– Use of Tag Extensions - Explaining custom tag concepts – Explaining taglib mapping – Understanding Tag Handlers – Exploring Dynamic Attributes.

SELF STUDY:

UNIT II: The MVG Connection – Components and Containers
UNIT III: Create a Popup Menu – Create a Toolbar
UNIT IV: Servlet Development Options – Using Tomcat – Simple Servlet
UNIT V: Using JSP Tag Extensions– Use of Tag Extensions - Explaining custom tag concepts

TEXT BOOKS

1. ***Java The Complete Reference,*** Herbert Schildt 9th Edition, Mc Graw Hill Education, 2016.
Chapters: 22, 30, 31, 32, 33,38
2. ***James McGovern***, Rahim Adatia and others, ***J2EE 1.4 Bible,*** 1st Edition, Wiley India (P) Ltd, (2008).
Chapters: 6,7,18

REFERENCES:

1. ***Java How to program,*** Paul Deitel& Harvey Deitel, 10th Edition, Pearson Publications, 2014.

2. ***Java in a Nutshell,*** David Flnagan, 5th Edition, O'Reilly Media Inc., 2014.
3. ***J2EE : The Complete Reference,*** Jim Keogh, Tata McGraw-Hill Publishing Company Limited , New Delhi, 1st Edition, 18th Reprint 2008.
4. ***Thinking in Java,*** Harry H.Chaudhary, Bruce Eckel, 4th Edition, Prentice Hall Publications, 2006.
5. ***Java2 (JDK 5 edition) Programming Black Book,*** Steven Holzner et al., Dreamtech Press, New Delhi 2006.

Digital Open Educational Resources (DOER)

1.https://www.udemy.com/course/advanced-java-programming
2. https://nareshit.in/advanced-java-training/
3.https://www.youtube.com/watch?v=Ae-r8hsbPUo

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks	CIA Total	% of Assessment

	T1 10 Mks.	T2 10 Mks.	Seminar 5 Mks.	Assignment 5 Mks	OBT/PPT 5 Mks	35 Mks.	C6 5 Mks.	40 Mks.	
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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse**, **K5-**Synthesis

EVALUATION PATTERN								
SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total

10	10	5	5	5	5	40	60	100

COURSE OUTCOMES (CO)

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED	POs ADDRESSED
CO 1	Describe client/server applications, TCP/IP socket programming and distributed applications using RMI.	K2,K3	PSO1& PSO2	PO1
CO 2	Analyze and design Window based applications using Swing Objects.	K2,K3	PSO3& PSO4	PO2
CO 3	Develop and design Java programs using Swing components	K3,K4	PSO2 &PSO5	PO3
CO 4	Discuss the various JDBC drivers and demonstrate J2EE application using JDBC connection and server side programs with Servlets.	K4,K5	PSO6 &PSO7	PO2 & PO3
CO 5	Write component-based Java programs using. JavaBeans.	K3,K5	PSO1 &PSO3	PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	1	1	2	2	2	3
CO2	2	2	3	2	3	2	2
CO3	2	3	2	2	2	2	2
CO4	2	2	2	2	2	3	3
CO5	3	2	3	1	2	1	1

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:
Dr.T.Vasantha

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

I M.Sc. Computer Science
SEMESTER –II

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG2B5	DATA MINING AND WAREHOUSING	CORE	6	5

COURSE DESCRIPTION

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

COURSE OBJECTIVES

- To interpret the contribution of data mining and data warehousing to the decision support level of organizations
- To understand different models used for OLAP and data pre-processing
- To categorize and differentiate between situations for applying different data mining techniques: mining frequent pattern, association, classification and cluster analysis
- To utilize Data Mining techniques in various real applications

UNITS

UNIT I: INTRODUCTION   (18 Hrs)
Introduction to Data Mining-its importance — Data Mining on what kind of Data- Data Mining Functionalities-What Kinds of Patterns Can Be Mined – Are All of the Patterns Interesting – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of Data Mining System with a Database or Data Warehouse System – Major Issues in Data Mining.

UNIT   II: DATA PREPROCESSING   (18 Hrs)
Need to Pre-process 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.

UNIT III: MINING FREQUENT PATTERNS AND CLASSIFICATION (18 Hrs)
Efficient and Scalable Frequent Itemset   Mining   Methods: The Apriori

Algorithm : Finding Frequent Itemsets Using Candidate Generation- Generating Association Rules from Frequent Itemsets- Improving the Efficiency of Apriori – Mining Frequent Itemsets without Candidate Generation- Mining Frequent Itemsets Using Vertical Data Format – Mining Closed Frequent Itemsets. Classification - Prediction – Issues Regarding Classification and Prediction – Classification by Decision Tree Induction – Bayesian Classification – Rule-Based Classification – Classification by Back propagation.

UNIT IV: CLUSTER ANALYSIS (18 Hrs)
What is Cluster Analysis – Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical Methods – Density-Based Methods – Grid-Based Methods – Model.

UNIT V: APPLICATIONS AND TRENDS IN DATA MINING (18 Hrs)
Data Mining Applications – Data Mining System Products and Research Prototypes – Additional Themes on Data Mining – Social Impacts of Data Mining – Trends in Data Mining.

SELF STUDY:

UNIT I: Integration of Data Mining System with a Database or Data Warehouse System
UNIT II: A Multidimensional Data Model – Data Warehouse Architecture
UNIT IV: Grid-Based Methods – Model-Based Clustering Methods.
UNIT V: Data Mining System Products and Research Prototypes – Additional Themes on Data Mining

TEXT BOOK

Data Mining Concepts and Techniques, Jiawei Han and Micheline Kamber, 2nd Edition, Morgan Kaufmann Publishers An Imprint of Elsevier, 2009.

Chapters:1, 2, 3, 5.2, 6.1 - 6.7, 7.1 – 7.8, 11

REFERENCES:
1. ***Data Mining Techniques and Applications: An Introduction,***Hongbo DLL, Cengage Lmg Business Press, 2010.

2. ***Data Warehousing: Concepts, Techniques, Products and Applications***, 3rd Edition, PHI Learning, Delhi, 2012.

3. ***Data Mining & Data Warehousing***, Udit Agarwal, 1st Edition, S.K.Kataria& sons Publication, 2016.

4. ***Data Mining: Concepts and Techniques***, Jiawei Han, Micheline Kamber, 3rd Edition Morgan Kauffmann Publishers, 2011.

Digital Open Educational Resources (DOER)

1. https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm
2. https://www.guru99.com/data-mining- tutorial.html
3. https://www.youtube.com/watch?v=syY4tCAxGfk

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	% As m
	T1	T2	Seminar	Assignment	OBT/PPT				

	10 Mks.	10 Mks.	5 Mks.	5 Mks	5 Mks	35 Mks.	5 Mks.	40Mks.	
K2	4	4	-	-	-	8	-	8	2
K3	2	2	-	5	-	9	-	9	22
K4	2	2	-	-	5	9	-	9	22
K5	2	2	5	-	-	9	-	9	22
Non Scholastic	-	-	-	-	-		5	5	12
Total	10	10	5	5	5	35	5	40	10

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

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

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	POs ADDRESSED
CO 1	Explain the fundamental concept of Data Mining and analyze and evaluate the data cleaning, integration , transformation and reduction techniques	K1	PSO1& PSO2	PO1
CO 2	Design multidimensional data using Data Warehouse architecture.	K1,,K2	PSO3& PSO4	PO2
CO 3	Design and evaluate Classification algorithms	K1,K3,K4	PSO7	PO3
CO 4	Identify the types of data in Cluster Analysis and categorize the Cluster Methods	K3,K4	PSO5	PO3
CO 5	Utilize the Data Mining techniques in various real applications and in major issues	K1,K2	PSO6, PSO7	PO4

Mapping COs Consistency with PSOs							
CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	1	3	1	1	2	2
CO2	1	2	1	2	1	2	2
CO3	2	2	2	2	1	1	3
CO4	2	2	2	2	3	1	3

CO5	2	2	2	2	1	3	2

<p align="center">Mapping COs Consistency with POs</p>

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

Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**
COURSE DESIGNER:
Dr. T.Vasantha

                                                                 Forwarded By

                                                 [signature]

                                                 (Dr.S.Vidya)
                                                 HOD'S Signature & Name

<p align="center">I M.Sc. Computer Science</p>
<p align="center">SEMESTER –II</p>
<p align="center"><i>For those who joined in 2023 onwards</i></p>

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	23PG2B6	ADVANCED JAVA	CORE	6	4

		PROGRAMMIN G LAB			

COURSE DESCRIPTION

Advanced Programming in Java consists of Networking concepts, GUI Programming with Swing and Swing Menus, JDBC and JSP.

COURSE OBJECTIVES

- To develop java programs using TCP/IP and RMI.
- To design and develop java programs using Swings Components.
- To implement Server Side Program with Servlets.
- To develop java programs using JSP.

Programs are written using the following concepts

1. NETWORKS- TCP/IP
2. REGULAR EXPRESSION
3. RMI
4. GUI Programming with Swing and Swing Components
5. Java Database Connectivity
6. SERVLET
7. JSP

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**
K1- Remember**,** **K2-**Understand**,** **K3-**Apply**,** **K4-**Analyse,
K5-Synthesis

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total

25	10	5	40	60	100

C1 – Average of Two Monthly Tests

C2 – Average of Weekly Tests

C3 – 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	PSOs ADDRESSED
CO 1	Implementation of java applications that illustrate professionally acceptable coding and performance standards.	K2	PSO1& PSO2	PO1& PO2
CO 2	Develop distributed applications using RMI.	K2, K3	PSO3& PSO4	PO1& PO2
CO 3	Design and development-driven programming and graphical user interfaces using Swing-based GUI.	K2, K4	PSO5	PO3 & PO4
CO 4	Design and develop Java programs using JDBC connection for data access and also Develop server side programs with Servlets.	K2, K3 & K4	PSO6	PO3 & PO4
CO 5	Design and develop component-based Java programs using JavaBeans.	K3& K5	PSO7	PO3 & PO4

Mapping COs Consistency with PSOs							
CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	2	2	2	2	2	2
CO2	2	2	3	2	2	2	2
CO3	2	2	2	3	2	2	2
CO4	2	2	2	2	2	2	1

CO5	2	2	2	2	2	1	2

<div align="center">

Mapping of COs with POs

</div>

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

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

COURSE DESIGNER:
Dr. G.Germine Mary

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

<div align="center">

I M.Sc. Computer Science

SEMESTER –II

For those who joined in 2023 onwards

</div>

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG2BE5	DATA MINING LAB USING R	ELECTIVE	4	3

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 pre-processing steps involved in different datasets

- To evaluate   classification algorithms using Weka tool with sample data.

- To evaluate   cluster algorithms using Weka tool with sample data.

SYLLABUS
DATA MINING USING R

1. Implement Apriori algorithm to extract association rule of data mining.
2. Implement k-means clustering technique.
3. Implement any one Hierarchal Clustering.
4. Implement Classification algorithm.
5. Implement Decision Tree.
6. Linear Regression.
7. Data Visualization.

✔ **The levels of CIA on Revised are:**
K1- Remember,
K3-Apply,
K5-Synthesis

CIA	
Scholastic	35
Non Scholastic	5
	40

Assessment based Bloom's Taxonomy

K2-Understand,
K4-Analyse,

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
25	10	5	40	60	100

C1 – Average of Two Monthly Tests

C2 – Average of Weekly Tests

C3 – Non – Scholastic

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Utilize Weka tool to evaluate Data Mining algorithms.	K1,K2	PSO1& PSO2	PO1
CO 2	Demonstrate pre-processing steps involved in different datasets.	K2,K3	PSO3	PO2
CO 3	Develop the decision tree algorithm using different datasets	K3,K4	PSO4	PO3
CO 4	Demonstrate the classification and clusters algorithms using large datasets.	K3,K4	PSO5 & PSO6	PO4
CO 5	Analyse Data Mining techniques for realistic data.	K1, K3, K4	PSO7	PO4

Mapping COs Consistency with PSOs							
CO/PSO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	1	1	2	2
CO2	2	1	3	1	1	2	2
CO3	2	2	2	3	1	2	2
CO4	2	2	2	1	3	3	1
CO5	2	2	2	1	2	2	3

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:

Dr.T.Vasantha

Forwarded By

(Dr.S.Vidya)

HOD'S Signature & Name

I M.Sc. Computer Science

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	23PG2BE6	OPERATING SYSTEM LAB	ELECTIVE	4	3

COURSE DESCRIPTION
In this lab students are able to describe and use the fundamental LINUX system tools and utilities.

COURSE OBJECTIVE/S
- To introduce the students to LINUX kernel programming

- To make the students aware of the features and capabilities of Linux so that they can utilize its improved functionalities
- To develop new Linux based software and can also contribute to the development of the operating system itself.

Programs are written using the following concepts:

Shell Script using Linux:

- To demonstrate various Shell commands like cat, grep, ls, more, ps, chmod, finger, ftp, etc.,

- Shell script to perform simple mathematical operations

- Shell script to perform string operations

- Shell script program to manipulate files

- Shell script to illustrate various system configurations

- Creating user accounts, switching user accounts, setting umask

- Linux general purpose utilities

- Shell script to customize user environment

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse,

K5-Synthesis

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
25	10	5	40	60	100

C1 – Average of Two Monthly Tests

C2 – Average of Weekly Tests

C3 – Non – Scholastic

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Utilize basic LINUX Utilities.	K3/K4	PSO1& PSO2	PO1
CO 2	Write different LINUX shell scripts and execute various shell programs.	K3/K4	PSO3& PSO7	PO2
CO 3	Apply LINUX system calls.	K3/K4	PSO5	PO2
CO 4	Compute various file permissions and have a basic understanding of system security.	K3/K4	PSO4	PO3

CO 5	Demonstrate the basic knowledge of Linux commands and file handling utilities by using Linux shell environment.	K1/K2	PSO6	PO4

Mapping COs Consistency with PSOs

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

Mapping of COs with POs

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

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

COURSE DESIGNER:
Dr.S.Arul Jothi

Forwarded By

I M.Sc. Computer Science

SEMESTER –I

**For those who joined in 2023 onwards**

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG2BE7	ADVANCED OPERATING SYSTEMS	ELECTIVE	4	3

COURSE DESCRIPTION

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

COURSE OBJECTIVES

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

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

UNITS

UNIT I : BASICS OF OPERATING SYSTEMS   (12 hrs)

Basics of Operating Systems: What is an Operating System? – Main frame Systems –Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems –Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments -Process Scheduling – Cooperating Processes – Inter Process Communication- Deadlocks –Prevention – Avoidance – Detection – Recovery.

UNIT II : DISTRIBUTED OPERATING SYSTEMS   (12 hrs)

Distributed Operating Systems: Issues – Communication Primitives – Lamports Logical Clocks – Deadlock handling strategies – Issues in deadlock detection and resolution-distributed file systems – design issues – Case studies – The Sun Network File System - Coda.

UNIT III : REAL TIME OPERATING SYSTEM   (12 hrs)

Real time Operating Systems : Introduction – Applications of Real Time Systems – Basic Model of Real Time System – Characteristics – Safety and Reliability - Real Time Task Scheduling.

UNIT IV : HAND HELD SYSTEM   (12 hrs)

Operating Systems for Handheld Systems: Requirements –Technology Overview–Handheld Operating Systems – Palm OS - Symbian Operating System – Android – Architecture of android– Securing handheld systems

UNIT V : CASE STUDIES   (10 hrs)

Case Studies : Linux System: Introduction – Memory Management – Process Scheduling – Scheduling Policy - Managing I/O devices – Accessing Files- iOS : Architecture and SDK Framework - Media Layer - Services Layer - Core OS Layer - File System.

UNIT VI : CONTEMPORARY ISSUES   (2 hrs)

Expert lectures, online seminars – webinars

SELF STUDY:

UNIT II

TEXT BOOK

1. **Operating System Concepts,** Abraham Silberschatz; Peter Baer Galvin; Greg Gagne, Seventh Edition, John Wiley & Sons, 2004.
2. **Advanced Concepts in Operating Systems – Distributed, Database, and Multiprocessor Operating Systems,** Mukesh Singhal and Niranjan G.

Shivaratri, Tata McGraw-Hill, 2001.

REFERENCES:

1. Real-Time Systems: Theory and Practice, *Rajib Mall, Pearson Education India, 2006.*

2. An introduction to operating systems, concept and practice, *Pramod Chandra P.Bhatt, PHI,Third edition, 2010.*

3. Understanding the Linux kernel, *Daniel.P.Bovet & MarcoCesati, 3rdedition, O"Reilly, 2005.*

4. iPhone iOS4 Development Essentials –Xcode, *Neil Smyth, Fourth Edition, Payload media, 2011.*

Digital Open Educational Resources (DOER)

1. https://onlinecourses.nptel.ac.in/noc20_cs04/preview
2. https://www.udacity.com/course/advanced-operating-systems--ud189
3. https://minnie.tuhs.org/CompArch/Resources/os-notes.pdf

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 %**

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse,

K5-Synthesis

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

C1 – Conducted for 30 marks and converted into 10 marks

COURSE OUTCOMES (CO)

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED	POs ADDRESSED
CO 1	Understand the design issues associated with operating systems	K3/K4	PSO1& PSO2	PO3

CO 2	Master various process management concepts including scheduling, deadlocks and distributed file systems	K1/K2	PSO3& PSO4	PO2
CO 3	Prepare Real Time Task Scheduling	K3/K4	PSO5	PO1
CO 4	Analyze Operating Systems for Handheld Systems	K3/K4	PSO6	PO4
CO 5	Analyze Operating Systems like LINUX and iOS	K1/K2	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	1	2	2	2	2	2	2
CO2	2	2	2	1	2	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	2	2	2
CO5	2	2	2	2	2	1	3

Mapping COs Consistency with POs

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

Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
♦ Weakly Correlated -**1**
COURSE DESIGNER:
Dr.S.Arul Jothi

Forwarded By

(Dr.S.Vidya)

I M.Sc. Computer Science

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	23PG2BE8	MULTIMEDIA TECHNOLOGIES	ELECTIVE	4	3

COURSE DESCRIPTION

This course explains the multimedia concepts, that is, image, text, sound, animation and the also it's applications.

COURSE OBJECTIVES

- To stress the importance of multimedia in today's requirements
- To understand the applications of multimedia in the development of current technologies.

UNIT I (12 HRS)

INTRODUCTION: Definition – Use of Multimedia – Delivering Multimedia
TEXT : The Power of Meaning - About Fonts and Faces - Using Text in Multimedia
Computers and Text-Font Editing and Design Tools-Hypermedia and Hypertext.

UNIT II (12 HRS)
IMAGES: Before You Start to Create-Making Still Images-Color.
SOUND: The Power of Sound - Digital Audio - MIDI Audio - MIDI vs. Digital Audio -Multimedia System Sounds-Audio File Formats-Vaughan's Law of Multimedia Minimums-Adding Sound to Your Multimedia Project.

UNIT III (12 HRS)
ANIMATIONS: VAnimation - The Power of Motion -Principles of Animation -Animation by Computer -Making Animations That Work.
VIDEO: Using Video - How Video Works and Is Displayed - Digital Video Containers- Obtaining Video Clips-Shooting and Editing Video.

UNIT IV: (12 HRS)
MAKING MULTIMEDIA : Making Multimedia -Stages of a Multimedia Project - The Intangibles – Hardware – Software – Authoring System. **Multimedia Skills.**

UNIT V: (12 HRS)
The Internet and Multimedia: History -Internetworking – Multimedia on the web.
Designing for the World Wide Web: Designing for the web-Text for the web-Images for the web-Sound for the web-Animation for the web-Video for the web,

SELF STUDY : UNIT V

TEXT BOOKS

Multimedia: Making it Work, Tay Vaughan, Published by McGraw – Hill Publishing Company Limited, 8thedition.

Chapter – 1-6, 12,13

REFERENCES

1. *MULTIMEDIA COMPUTING By Dr.Tariq Hussain · Published by Booksclinic Publishing, 2020*
2. Multimedia Applications By Ralf Steinmetz, Klara Nahrstedt · Digital Open Educational Resources (DOER) Published by Springer, March
3. Multimedia In Practice By Jeffcoate, *Published by Pearson Education*

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
2. https://www.geeksforgeeks.org/what-is-multimedia/

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.	40 Mks.	
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 %

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**
K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	**10**	**5**	**5**	**5**	**5**	**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	POs ADDRESSED
CO 1	Understand the basic concept of multimedia.	**K1,K2**	**PSO1& PSO4**	**PO1**
CO 2	Understand the concept behind the text and images, sound.	**K1,K2**	**PSO3**	**PO1 & PO2**

CO 3	Understand the concept behind the animation and video.	K3,K4	PSO4 &PSO5	PO1 & PO2
CO 4	Understand the concept behind the creation of multimedia applications	K1,K2	PSO6	PO3
CO 5	Understand the applications of multimedia in media	K2,K3	PSO7	PO4

Mapping COs Consistency with PSOs

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

Mapping of COs with POs

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

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

COURSE DESIGNER:

Dr.P.Meenakshi Sundari

Forwarded By

I M.Sc. Computer Science

SEMESTER –II

For those who joined in 2023 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	23PG2BAE	WEB Designing using CSS & JavaScript	Ability Enhancement Course	4	2

COURSE DESCRIPTION

This Course introduces basic web design using Hypertext Markup Language (HTML), Java script and Cascading Style Sheets (CSS). And this course provides knowledge to plan and design effective web pages with different text formatting and images to create websites.

COURSE OBJECTIVES

- To enhance the knowledge of the students in effective webpage designing.

- To provide skills to sharply focus on needed information to be presented in a website.
- To improve the quality of the students by giving a strong base in fundamental and advanced concepts.
- To give courage to face the real-world scenarios as it is practical oriented
- To inculcate the ability to explain, analyze, identify and define the technology required to build and implement a web site.

UNITS

UNIT I: OVERVIEW OF HTML   **(12 Hrs)**
Fundamentals of HTML - Root Elements-Metadata Elements- Section Elements-Heading Elements-Flow Elements- Phrasing Elements- Embedded Elements- Interactive Elements –Working with Headings-Character Entities – Horizontal Rules – Line Breaks – Paragraph – Citations – Quotations – Definitions - Comments.

UNIT II: WORKING WITH TEXT & CREATING TABLES   **(12 Hrs)**
Working with Text - Formatting Text with HTML Elements – Physical styles – Logical styles – Defining the MARK Element- Defining the STRONG Element- Creating Tables - Understanding Tables – Describing the TABLE Elements – CAPTION –COLGROUP – COL – TBODY – THEAD – TFOOT – TR – TD and TH - Creating a Simple Table – Adding a Title to a Table – Caption to a Table

UNIT III: HTML FORMS AND CONTROLS   **(12 Hrs)**
        Creating HTML forms – Buttons – Checkboxes – File input - For a From – Hidden data - Image Submit Buttons – Password Controls – Radio Buttons – Reset Buttons – Customizable Button – Select Control – Grouping and Labeling – An Index – Processing Secure Transactions - Events

UNIT IV: JAVA SCRIPT   **(12 Hrs)**
        Introduction to Java script – Adding JavaScript to XHTML documents - the<script> element – using the <script> element- event handlers – Java script core features – basic definitions – Language characteristics – variables- basic data types – composite types – Flow control statements-Loops – Input and Output in Java script

UNIT V: UNDERSTANDING CSS   **(12 Hrs)**
Overview of CSS – Discussing the Evolution of CSS – Understanding the Syntax of CSS – Exploring CSS Selectors – Inserting CSS in an HTML Document.

SELF STUDY:
UNIT I: Working with Headings-Character Entities – Horizontal Rules – Line Breaks – Paragraph – Citations – Quotations – Definitions - Comments
UNIT III: Adding a Title to a Table – Caption to a Table – Specifying the Properties of the Columns
UNIT IV: Javascript core features – basic definitions – Language characteristics

TEXT BOOK

HTML5 Black Book, Kogent Learning Solutions Inc., Dreamtech Press, 2012.

JavaScript: The complete reference , Thomas Powell & Fritz Schneider ,2nd edition, Tata McGraw Hill Education Private Limited, New Delhi, 2014

REFERENCES

- ***Sergey's HTML5 & CSS3 Quick Reference: Color Edition,*** Sergey Mavrody, Published 16 Nov 2009.
- ***HTML5: The Missing Manual,*** Matthew MacDonald,Published in 2011.
- ***Head First HTML5 Programming: Building Web Apps with JavaScript,*** Elisabeth Freeman and Eric Freeman, Published in 2011.
- ***Beginning HTML5 and CSS3 For Dummies,*** Chris Minnick and Ed Tittel, Published 2013.

Digital Open Educational Resources (DOER)

5. https://www.tutorialspoint.com/html5/index.htm
6. https://www.w3schools.com/html/default.asp
7. https://www.tutorialrepublic.com/html-tutorial/
8. https://www.cs.uct.ac.za/mit_notes/web_programming.html

Levels	C1 T1 10 Mks.	C2 T2 10 Mks.	C3 Seminar 5 Mks.	C4 Assignment 5 Mks	C5 OBT/PPT 5 Mks	Total Scholastic Marks 35 Mks.	Non Scholastic Marks C6 5 Mks.	CIA Total 40Mks.	% of Assessment
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 %

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Define various tags of HTML	K1	PSO1& PSO2	PO1
CO 2	Design a web page with attractive display	K3	PSO3& PSO7	PO2
CO 3	Create a Layout for a webpage using Block tags and java script	K3	PSO4	PO4

| CO 4 | Explain how and where to apply CSS | K3 | PSO6 | PO3 |
| CO 5 | Analyze content to design website | K4 | PSO5 | PO4 |

Mapping COs Consistency with PSOs

CO/PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	3	1	2	2	2	1
CO2	1	1	2	2	2	2	3
CO3	2	2	2	3	2	2	2
CO4	2	2	2	1	1	2	1
CO5	2	2	2	1	3	1	1

Mapping COs Consistency with POs

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

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

Dr.S.Arul jothi

Forwarded By

(Dr.S.Vidya)
HOD'S Signature & Name

PROGRAM ME CODE	COURSE CODE	COURSE TITLE	CATEGO RY	HRS/WEEK	CREDIT S
PSCS	22PG3B12	MACHINE LEARNING	MAJOR	5	5

COURSE DESCRIPTION

This course provides an introduction to learn Machine Intelligence and Machine Learning Applications algorithms to solve real world problems.

COURSE OBJECTIVE

❖ introduce the fundamentals of Machine Learning and algorithms.
❖ To define the classifiers and its associated algorithms
❖ To impart the knowledge on supervised and unsupervised learning algorithms used for classification, prediction and clustering.

UNIT - I INTRODUCTION   (15 Hours)
Introduction to machine learning -Learning Problems – Learning System – Issues in machine learning - Concept Learning - Learning Task – General-to-specific Ordering – Specific Hypothesis – Candidate Elimination – Inductive Bias.

UNIT – II DECISION TREE & BAYESIAN LEARNING   (15 Hours)
Decision Tree Learning -Decision tree representation – Issues in decision tree learning- Bayesian Learning - Bayes Theorem – Bayes Theorem and Concept Learning – Naive Bayes classifier - Bayesian Networks -EM Algorithm

UNIT - III   GENETIC ALGORITHMS   (15 Hours)
Introduction to Instance Based Learning – K-Nearest Neighbor Learning - Radial Basis Function, Case based reasoning - Genetic Algorithms - Hypotheses – Genetic Operators – Hypothesis Space Search – Genetic Programming – Models of Evolution and Learning.

UNIT - IV   LEARNING SETS OF RULES   (15 Hours)
Introduction to Learning Sets of Rules -Sequential Covering Algorithms – Learning First order Rules – FOIL – Inverting Resolution - Analytical Learning - PROLOG EBG – Explanation Based learning – Features.

UNIT - V ANALYTICAL& REINFORCEMENT LEARNING   (15 Hours)
Combining Inductive and Analytical Learning - Approaches – KBANN Algorithm – TANGENTPROP – EBNN – FOCL - Reinforcement Learning - Learning Task – Q Learning – Non deterministic Actions – Temporal Difference Learning – Relationship to Dynamic Programming.

SELF STUDY: UNIT -V

TEXT BOOK

Tom M. Mitchell , "Machine Learning", Tata McGraw-Hill, New Delhi
Chapter – 1, 2,3, 6,9,10,11,13

REFERENCES :
1. Hastie.T, Tibshirani.R, and Friedman.J, "The Elements of Statistical Learning: Data Mining Inference and Prediction", Second edition, Springer, 2009
2. Introduction to Machine Learning By EthemAlpaydin · 2014, MIT PRESS
3. Christopher M. Bishop , "Pattern Recognition and Machine Learning – Information Scienceand Statistics", Springer, 2007

WEB REFERENCES :
1. https://machinelearningmastery.com/machine-learning-with-python/
2. http://ibpsa.fr/jdownloads/Simurex/2015/Presentations/30_03_atelierdatamining.pdf

Levels	C1 T1 10 Mks.	C2 T2 10 Mks.	C3 Seminar 5 Mks.	C4 Assignment 5 Mks	C5 OBT/PPT 5 Mks	Total Scholastic Marks 35 Mks.	Non Scholastic Marks C6 5 Mks.	CIA Total 40Mks.	% of Assessment
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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**,** **K2-**Understand**,** **K3-**Apply**,** **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total

10	10	5	5	5	5	40	60	100

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO1	Explain the fundamental concept of Machine Learning.	K2,K3	PSO1& PSO2	PO1
CO 2	Analyse the decision tree and explain the Bayesian learning.	K2,K3	PSO3& PSO4	PO2
CO 3	Discuss the genetic algorithms	K3,K4	PSO2 &PSO5	PO3
CO 4	Apply the learning set of rules and discuss the learning features	K4,K5	PSO6 &PSO7	PO2 & PO3
CO 5	Explain the Reinforcement learning and analyse the relationships to dynamic programming.	K3,K5	PSO1 &PSO3	PO4

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	1	1	2	2	2	3
CO2	2	2	3	2	3	2	2
CO3	2	3	2	2	2	2	2
CO4	2	2	2	2	2	3	3
CO5	3	2	3	1	2	1	1

Mapping COs Consistency with POs

CO/PSO	PO1	PO2	PO3	PO4
CO1	3	1	2	2
CO2	2	2	2	2
CO3	2	1	3	2
CO4	2	2	1	1
CO5	2	1	3	3
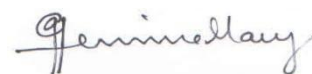
Note: ♦ Strongly Correlated – **3**   ♦ Moderately Correlated – **2**
  ♦ Weakly Correlated -**1**

COURSE DESIGNER:

   Staff Name: Dr..P.MEENAKSHI SUNDARI

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3B13	DATA MINING AND DATA WAREHOUSING	LECTURE	5	5

COURSE DESCRIPTION

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

COURSE OBJECTIVES

- To interpret the contribution of data mining and data warehousing to the decision support level of organizations
- To understand different models used for OLAP and data pre-processing
- To categorize and differentiate between situations for applying different data mining techniques: mining frequent pattern, association, classification and cluster analysis
- To utilize Data Mining techniques in various real applications

UNITS

UNIT I: INTRODUCTION   **(15 Hrs)**
Introduction to Data Mining-its importance — Data Mining on what kind of Data- Data Mining Functionalities-What Kinds of Patterns Can Be Mined – Are All of the Patterns Interesting – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of Data Mining System with a Database or Data Warehouse System – Major Issues in Data Mining.

UNIT II: DATA PREPROCESSING   **(15 Hrs)**
Need to Pre-process 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.

UNIT III: MINING FREQUENT PATTERNS AND CLASSIFICATION(15 Hrs)

Efficient and Scalable Frequent Itemset Mining Methods: The Apriori Algorithm : Finding Frequent Itemsets Using Candidate Generation- Generating Association Rules from Frequent Itemsets- Improving the Efficiency of Apriori – Mining Frequent Itemsets without Candidate Generation- Mining Frequent Itemsets Using Vertical Data Format – Mining Closed Frequent Itemsets. Classification - Prediction – Issues Regarding Classification and Prediction – Classification by Decision Tree Induction – Bayesian Classification – Rule-Based Classification – Classification by Back propagation – Support Vector Machines.

UNIT IV: CLUSTER ANALYSIS   (15 Hrs)

What is Cluster Analysis – Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical Methods – Density-Based Methods – Grid-Based Methods – Model-Based Clustering Methods.

UNIT V: APPLICATIONS AND TRENDS IN DATA MINING   (15 Hrs)

Data Mining Applications – Data Mining System Products and Research Prototypes – Additional Themes on Data Mining – Social Impacts of Data Mining – Trends in Data Mining.

SELF STUDY:

UNIT I: Integration of Data Mining System with a Database or Data Warehouse System
UNIT II: A Multidimensional Data Model – Data Warehouse Architecture
UNIT IV: Grid-Based Methods – Model-Based Clustering Methods.
UNIT V: Data Mining System Products and Research Prototypes – Additional Themes on Data Mining

TEXT BOOK

Data Mining Concepts and Techniques, Jiawei Han and MichelineKamber, 2nd Edition, Morgan   Kaufmann Publishers An Imprint of Elsevier, 2009.

Chapters:1, 2, 3, 5.2, 6.1 - 6.7, 7.1 – 7.8, 11

REFERENCES:

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

2. ***Data Warehousing: Concepts, Techniques, Products and Applications***, 3rd Edition, PHI Learning, Delhi, 2012.

3. ***Data Mining & Data Warehousing***, Udit Agarwal, 1st Edition, S.K.Kataria& sons Publication, 2016.

4. ***Data Mining: Concepts and Techniques***, Jiawei Han, MichelineKamber, 3rd Edition Morgan Kauffmann Publishers, 2011.

Digital Open Educational Resources (DOER)

1. https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm
2. https://www.guru99.com/data-mining- tutorial.html
3. https://www.youtube.com/watch?v=syY4tCAxGfk

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Explain the fundamental concept of Data Mining and analyze and evaluate the data cleaning, integration , transformation and reduction techniques	K1	PSO1& PSO2	PO1
CO 2	Design multidimensional data using Data Warehouse architecture.	K1,,K2	PSO3& PSO4	PO2
CO 3	Design and evaluate Classification algorithms	K1,K3,K4	PSO7	PO3
CO 4	Identify the types of data in Cluster Analysis and categorize the Cluster Methods	K3,K4	PSO5	PO3
CO 5	Utilize the Data Mining techniques in various real applications and in major issues	K1,K2	PSO6, PSO7	PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	1	3	1	1	2	2
CO2	1	2	1	2	1	2	2
CO3	2	2	2	2	1	1	3
CO4	2	2	2	2	3	1	3
CO5	2	2	2	2	1	3	2

CO/ PSO	PO1	PO2	PO3	PO4
Mapping COs Consistency with POs				
CO1	2	1	2	2
CO2	1	2	2	2
CO3	2	2	3	1
CO4	2	2	3	1
CO5	2	2	1	3

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.T.Vasantha

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.SC COMPUTER SCIENCE
SEMESTER – III
(For those who joined in 2022 onwards)

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	22PG3B14	LAB V-MACHINE LEARNING WITH PYTHON	MAJOR LAB	5	3

COURSE DESCRIPTION

This course provides experiential learning and implementation of machine learning concepts using python

COURSE OBJECTIVE

❖ To Acquire knowledge and Skills for creation of Web applications.
❖ To implement regression and Classification using Python

LAB LIST

- Exercise to develop simple web applications in Python
- Exercise to manipulate data using different queries
- Exercises to handle Exceptions, Multithreading
- Exercise to extract features from datasets
- Exercise to implement Regression
- Exercise to implement Classification
- Exercise to implement Clustering
- Exercises for Model selection and evaluation
- Exercises to Build a data pipeline.

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

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

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	C2	C3	CIA	ESE	Total
25	10	5	40	60	100

- **C1** – Average of Two Monthly Tests
- **C2** – Average of Weekly Tests
- **C3** – 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	PSOs ADDRESSED
CO 1	Design web applications using python programming	K2	PSO1& PSO2	PO1& PO2
CO 2	Manipulate data using different queries.	K2, K3	PSO3& PSO4	PO1& PO2
CO 3	Extract features from the data set	K2, K4	PSO5	PO3 & PO4
CO 4	Implement Machine learning Algorithms	K2, K3 & K4	PSO6	PO3 & PO4
CO 5	Build data pipeline using machine learning in python.	K3& K5	PSO7	PO3 & PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	2	2	2	2	2	2	2
CO2	2	2	3	2	2	2	2
CO3	2	2	2	3	2	2	2
CO4	2	2	2	2	2	2	1
CO5	2	2	2	2	2	1	2

Mapping of C0s with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.P.MEENAKSHI SUNDARI

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3B15	LAB VI – 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 pre-processing steps involved in different datasets
- To evaluate classification algorithms using Weka tool with sample data.
- To evaluate cluster algorithms using Weka tool with sample data .

SYLLABUS

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 weather-nominal.arff using apriori algorithm
5. Demonstration of Mining Frequent Itemsets without Candidate Generation using supermarker.arff.
6. Test on classification of decision tree using segment-test.arff
7. Demonstration of classification rule process on dataset contact-lens.arff using j48 algorithm.
8. Demonstration of classification rule process on dataset iris.arff using id3 algorithm
9. Demonstration of classification rule process on dataset labor.arff using naïve bayes algorithm.
10. Demonstration of clustering rule process on dataset vote.arff using k-means algorithm

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

SCHOLASTIC		NON - SCHOLASTIC	MARKS		
C1	**C2**	**C3**	**CIA**	**ESE**	**Total**
25	**10**	**5**	**40**	**60**	**100**

- **C1** – Average of Two Monthly Tests
- **C2** – Average of Weekly Tests
- **C3** – Non – Scholastic

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Utilize Weka tool to evaluate Data Mining algorithms.	K1,K2	PSO1& PSO2	PO1
CO 2	Demonstrate pre-processing steps involved in different datasets.	K2,K3	PSO3	PO2
CO 3	Develop the decision tree algorithm using different datasets	K3,K4	PSO4	PO3

CO 4	Demonstrate the classification and clusters algorithms using large datasets.	K3,K4		PSO5 & PSO6		PO4	
CO 5	Analyze Data Mining techniques for realistic data.	K1, K3, K4		PSO7		PO4	

Mapping COs Consistency with PSOs

CO/ PSO	PS O1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	2	1	1	1	2	2
CO2	2	1	3	1	1	2	2
CO3	2	2	2	3	1	2	2
CO4	2	2	2	1	3	3	1
CO5	2	2	2	1	2	2	3

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.T.Vasantha

Forwarded By

(Dr.G.Germine Mary)

II M.Sc. Computer Science
SEMESTER –III
For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3BE5	PYTHON PROGRAMMING	LECTURE	5	5

COURSE DESCRIPTION

Python is an interpreted, high-level, general-purpose programming language. it provides constructs that enable clear programming on both small and large scales.

COURSE OBJECTIVES

- To understand why python is a useful scripting language for developers.
- To learn how to design and program python applications.
- To learn how to use lists, tuples, and dictionaries in python programs

UNITS

UNIT I: BASIC OF PYTHON PROGRAMMING   (15 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.

UNIT II: DECISION CONTROL STATEMENTS   (15 HRS)
        Introduction to Decision Control Statements-Selection /Conditional Branching Statements-Basic Loop Structure /Iterative Statements-Nested Loops-The Break Statement-The Continue Statement-The Pass Statement-The Else Statement used with Loops. Functions and Modules: Introduction –Function Declaration and Definition-Function Call-Variables Scope and Lifetime-The Return Statement-More On Defining Function-Lambda Functions or Anonymous Functions-Documentation Strings.

UNIT III: PYTHON STRINGS REVISITED   (15 HRS)

Concatenating ,Appending ,and Multiplying Strings-String Formatting Operator-Build in String Methods and Functions-Slice Operation-Ord()and Chr() Function-Comparing String-Iteration String –The String Module-Regular Expressions-Metacharacters in Regular Expression. File Handling: File Path-Types of Files-Opening and Closing Files-Reading and Writing Files-File Positions-Renaming and Deleting Files-Directory Methods.

UNIT IV: DATA STRUCTURES   (15 HRS)

Sequence-Lists-Functional Programming-Tuple-Sets-Dictionaries Classes and Objects:Classes and Objects-Class Methods and Self Arguments,Constructer-Class Variables and Object Variables-Other Special Methods-Public and Private Data Members-Private Methods-Built in Function-Built in Class Attributes-Garbage Collection-Class Methods-Static Methods

UNIT V: INHERITANCE   (15 HRS)

Inheriting Classes in Python-Types of Inheritance-Composition-Abstract Classes and Interfaces-Metaclass. Operator overloading: Introduction-Implementing Operator Overloading-Reverse Adding-Overriding –Getitem-(),Setitem-(),Methods-Overriding the in Operator-Overloading Miscellaneous Function-Overriding the –Call-() Method. Error and Exception Handling: Introduction to Errors and Exceptions-Handling Exceptions-Multiple Except Blocks-Multiple Exceptions in A Single Block-Except Block without Exception –The else Clause- Raising Exception-Instantiating Exceptions-Handling Exception in Invoked Functions.

UNIT VI: SIMPLE WEB APPLICATION DEVELOPMENT (INTERNAL)

SELF STUDY:

UNIT II
TEXT BOOK
  1. ***Python Programming using Problem Solving Approach,*** ReemaThareja,Published By Oxford Higher Education, 2017

REFERENCES:
  1. ***Problem Solving and Python Programming,*** S.A. Kulkarni, Published By Yesdee, 2017
  2. ***Python for Software Design How to Think Like a computer scientist***, Allen B.Downey Cambridge University Press, 2018
  3. ***Introduction to Programming using Python ,***Y.DanielLiang,Published By Pearson, 2018.

Digital Open Educational Resources (DOER)

1. https://hanj.cs.illinois.edu/bk3/bk3_slidesindex.htm
2. https://www.guru99.com/data-mining- tutorial.html
3. https://www.youtube.com/watch?v=syY4tCAxGfk

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse**, K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Understand python is a useful scripting language for developers.	K2	PSO1& PSO2	PO1
CO 2	Apply to lists, tuples, and dictionaries in python programs	K2, K3	PSO3& PSO4	PO1
CO 3	Identify the structure and components of a python program.	K2, K4	PSO5	PO2
CO 4	Analyze the design philosophy that emphasizes code readability,notably using significant whitespace.	K2, K3 & K4	PSO6	PO2
CO 5	Utilizing a new software tool.	K3& K5	PSO7	PO3

Mapping COs Consistency with PSOs

CO / PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	3	3	1	2	2	2	2
CO 2	1	1	2	2	3	1	2

CO 3	2	2	2	2	3	1	2
CO 4	2	2	2	2	1	3	2
CO 5	2	2	2	2	1	1	3

Mapping of COs with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.P.MeenakshiSundari

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.Sc. Computer Science
SEMESTER –III
For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	19PG3BE6	CRYPTOGRAPHY AND NETWORK SECURITY	LECTURE	5	5

COURSE DESCRIPTION

To understand design issues in Network Security and to understand security threats, security services and mechanisms to counter them.

COURSE OBJECTIVES

- To know the methods of conventional encryption.
- To understand the concepts of public key encryption
- To understand authentication and Hash functions.
- To know the network security tools and applications.
- To understand the system level security used.

UNITS

UNIT I: INTRODUCTION (15 Hrs)
Classical Encryption Techniques: Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Rotor Machines – Steganography, Block Ciphers and the DES: Traditional Block Cipher Structure – The Data Encryption Standard – A DES Example – The Strength of DES – Block Cipher Design Principles.

UNIT II: PUBLIC KEY CRYPTOGRAPHY (15 Hrs)

Public Key Cryptography and RSA:Principles of Public-key Cryptosystems – The RSA Algorithm, Other Public Key Cryptosystems: Diffie-Hellman key Exchange – Elgamal Cryptographic System - Elliptic Curve Arithmetic and Cryptography.

UNIT III: AUTHENTICATION AND HASH FUNCTION (15 Hrs)

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions-Two Simple Hash Functions – Requirements and Security – Hash Functions based on cipher block chaining - SHA, Message Authentication Codes: Message Authentication Requirements - Message Authentication Functions – Requirements of Message Authentication Codes – Security of MACs - MACs based on hash functions: HMAC.

UNIT IV: DIGITAL SIGNATURES AND KEY MANAGEMENT (15 Hrs)

Digital Signatures: properties – Attacks And Forgeries – Digital Signature Requirements – Direct Digital Signature – Elgammal Digital Signature Scheme – Schnorr Digital Signature Scheme – NIST Digital Signature Algorithm, Key Management and Distribution: Symmetric Key Distribution Using Symmetric and Asymmetric Encryption – Distribution of Public Keys.

UNIT V: NETWORK SECURITY (15 Hrs)

User Authentication: Remote user authentication principles – Kerberos Version 5, Electronic Mail Security: PGP - S/MIME, IP Security: Overview - IP Security Policy – Encapsulating Security Payload.

SELF STUDY:

UNIT 1: Classical Encryption Techniques: Symmetric Cipher Model – Substitution Techniques – Transposition Techniques.

UNIT IV: Key Management and Distribution: Symmetric Key Distribution Using Symmetric and Asymmetric Encryption – Distribution of Public Keys**.**

TEXT BOOK
Cryptography and Network Security Principles and Practices, W.Stallings, 6th Edition, Pearson Publications, 2015.
Chapters: 1, 2, 8, 9.1 - 9.4, 10.1 - 10.5, 11.1 - 11.5, 12.1 - 12.4, 13.1 - 13.3, 14.1, 14.3, 17.1, 17.2, 18.1 - 18.3

REFERENCES:
1. *Cryptography and Network Security*, BehrouzA.Forouzan and DebdeepMukhopadhyay, The McGraw Hill Publication, 2010.
2. *Cryptography and Network Security*, AtulKahate, 3rd Edition, McGraw Hill Education (India) Pvt. Ltd., 2013.

3. *Network Security Essentials Applications and Standards,* WilliamStallings, Pearson Education Publications, 2013.
4. *Cryptography and Network Security*, PS Gill, Trinity Publish, 2014.

Digital Open Educational Resources (DOER)

1. https://www.edn.com/cryptography-and-network-security-the-basics-part-i/
2. https://www.vssut.ac.in/lecture_notes/lecture1428550736.pdf
3. https://www.geeksforgeeks.org/cryptography-and-network-security-principles/

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Explain the various symmetric encryption techniques and demonstrate the functionalities of DES algorithm.	K1/K2	PSO1& PSO2	PO1
CO 2	Analyze public key algorithms.	K3/K4	PSO3& PSO4	PO2
CO 3	Evaluate the authentication concept and hash algorithms.	K2/K3	PSO5	PO3
CO 4	Apply the concepts of key management techniques.	K3/K4	PSO6	PO4
CO 5	Analyze the vulnerabilities in data communication through networks.	K3/K4	PSO7	PO3

Mapping COs Consistency with PSOs

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

CO4	2	2	2	2	1	3	1
CO5	2	2	2	2	1	2	3

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.S.ArulJothi

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3BE7	DISTRIBUTED DATABASE MANAGEMENT SYSTEM	LECTURE	5	5

COURSE DESCRIPTION

Distributed Database contains Overview of Distributed Database, Query Processing , Distributed Concurrency Control , Reliability and Replication, Distributed Object Database Management

COURSE OBJECTIVES

- To understand the basic concepts of Distributed Database
- To interpret Objectives of Query Processing
- To understand Concurrency Control of Distributed Database
- To describe Reliability and Replication protocols and understand fundamental Object Concepts and Object Models

UNITS

UNIT I : Overview Of Distributed Database   (15 Hrs)

Distributed Data Processing - What is a Distributed Database System? - Data Delivery Alternatives -Promises of DDBSs-Complicating factors -Problem

Areas16 -Distributed Database Design - Top-Down Design Process-Bottom-up Design Process - Distribution Design – Fragmentation.

UNIT II : Overview Of Query Processing (15 Hrs)

Query Processing Problem - Objectives of Query Processing -Complexity of Relational Algebra Operations - Characterization of Query Processors - Layers of Query Processing - Query Decomposition.

UNIT III : Distributed Concurrency Control (15 Hrs)

Serializability Theory - Taxonomy of Concurrency Control Mechanisms - Locking-Based Concurrency Control Algorithms- Timestamp-Based Concurrency Control Algorithms - Optimistic Concurrency Control Algorithms-Deadlock Management.

UNIT IV : Reliability And Replication (15 Hrs)

Reliability Concepts and Measures - Failures in Distributed DBMS – Local Reliability Protocols - Distributed Reliability Protocols – Dealing with Site - Network Partitioning - Consistency of Replicated Databases - Replication Protocols - Group Communication .

UNIT V : Distributed Object Database Management (15 Hrs)

Fundamental Object Concepts and Object Models - Object Distribution Design Architectural Issues - Object Management - Distributed Object Storage - Object Query Processing - Transaction Management.

SELF STUDY :

UNIT I: Overview of Distributed Database: - Promises of DDBSs- Complicating factors
UNIT II: Query Processing Problem - Objectives of Query Processing UNIT III: Optimistic Concurrency Control Algorithms
UNIT IV: **Reliability And Replication** : Failures in Distributed DBMS, Dealing with Site
UNIT V: **Distributed Object Database Management** : Architectural Issues

TEXT BOOK

Principles of Distributed Database Systems, M. Tamer Özsu and Patrick Valduriez, 3rd Edition, Springer, 2010. Chapters:1, 3, 6, 7, 11, 12, 13, 15.

REFERENCES:

1. *Principles of Distributed database systems,* M.T. Ozsu and S. Sridhar, Pearson Education Publication, 2008.
2. *Distributed Database Systems*, Chhanda Ray, Pearson Education, India, 2009.
3. *Distributed Database Management Systems: A Practical*

Approach, Saeed K.Rahini&Frank.S.Haug, Wiley-IEEE Computer Society Press, 2010.

Digital Open Educational Resources (DOER)

4. https://cs.uwaterloo.ca/~tozsu/courses/cs856/F02/lecture-1-ho.pdf
5. https://docs.oracle.com/cd/B19306_01/server.102/b14231/ds_concepts. htm
6. https://www.brainkart.com/article/Distributed-Database-Concepts_11590/

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Compare normal and distributed DBMS and to explain various approaches of DDBMS.	K1	PSO1& PSO2	PO1
CO 2	Formulate various kinds of retrieving statements to retrieve information from DDB.	K1,,K2	PSO3& PSO4	PO2
CO 3	Explain multiple processes dealing with distributed database system without clash	K1K2	PSO5	PO1
CO 4	Describe the set of protocols used in DDBMS to make effective communication.	K3,K4	PSO6	PO3

CO 5	Discuss object concepts and object models.	K1,K2	PSO7	PO4

Mapping COs Consistency with PSOs

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

Mapping COs Consistency with POs

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

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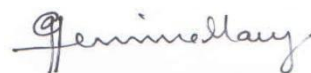
♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.S.ArulJothi

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3BE8	COMPILER DESIGN	LECTURE	5	5

COURSE DESCRIPTION

Explore the principles, algorithms, and data structure involved in the design and construction of compilers.

COURSE OBJECTIVES

- To provide knowledge on system oriented concepts
- To help them to write efficient programs, understanding the implementation requirements

UNITS

UNIT I - INTRODUCTION TO COMPILING   (15 Hrs)

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II - SYNTAX ANALYSIS   (15 Hrs)

Role of the parser –Context-Free Grammars – Writing Grammars- Top Down parsing –Bottom-up parsing – Operator Precedent Parsing

UNIT III - INTERMEDIATE CODE GENERATION   (15 Hrs)

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions –Case Statements – Back patching – Procedure calls.

UNIT IV - CODE GENERATION   (15 Hrs)

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator –Register allocation and Assignment – DAG representation of Basic Blocks.

UNIT V - CODE OPTIMIZATION   (15 Hrs)

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Loops in flow Graphs

SELF STUDY:

UNIT I: Role of Lexical Analyzer – Input Buffering – Specification of Tokens.
UNIT II: LR Parsers.
UNIT III: Procedure calls.
UNIT IV: DAG representation of Basic Blocks.
UNIT V: Loops in flow Graphs

TEXT BOOK

Compilers Principles, Techniques and Tools, Alfred Aho, Ravi Sethi, Jeffrey D Ullman,2nd Edition Pearson Education Asia.2015
Chapter 1,3.1 to 3.3, 4.1 to 4.7, 8, 9.1 to 9.8, 10.1 to 10.4

REFERENCES:

1. *Compiler Design* ,H.S.Mohan,Narosa Publishing House,2014
2. *Compiler Design in* R. Venkatesh and N. Uma Maheswari and S.Jeyanthi, Yes Dee Publishing Pvt Lid,2015
3. *Compiler Design ,*R,GodfreyWinster,S. Aruna Devi, R.Sujatha,Published By Yes Dee Publishing Pvt.Ltd, 2017

Digital Open Educational Resources (DOER)

1. https://www.vssut.ac.in/lecture_notes/lecture1422914957.pdf
2. https://www.guru99.com/compiler-design-tutorial.html
3. http://www.svecw.edu.in/Docs%5CCSECDLNotes2013.pdf

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	A
	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	
K3	2	2	-	5	-	9	-	9	2
K4	2	2	-	-	5	9	-	9	2
K5	2	2	5	-	-	9	-	9	2
Non Scholastic	-	-	-	-	-		5	5	1
Total	10	10	5	5	5	35	5	40	1

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Describe the phases of Compiler	K1/K2/K3	PSO1& PSO2	PO1
CO 2	Explain the role and type of Parser	K1/K2/K3	PSO3& PSO4	PO1
CO 3	Analyze and use Intermediate languages	K1/K2/K3/K4	PSO5	PO2
CO 4	Describe the design of code generation with register utilization	K1/K2/K3	PSO6	PO3
CO 5	Demonstrate code optimization techniques.	K1/K2/K3	PSO7	PO4

Mapping COs Consistency with PSOs

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

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.S.ArulJothi

Forwarded By

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3BE9	CLOUD COMPUTING	LECTURE	5	5

COURSE DESCRIPTION

This course describes the cloud environment, building software systems and components that scale to millions of users in modern internet.

COURSE OBJECTIVES

- To learn Parallel and distributed communication
- To understand distributed resource management
- To study about virtualization and cloud resource management

UNITS

UNIT I: Introduction   (15 Hrs)

Introduction : Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies, Principles of Parallel and Distributed Computing: Eras of Computing - Parallel vs. Distributed Computing - Elements of Parallel Computing - Elements of Distributed Computing - Technologies for Distributed Computing.

UNIT II: Virtualization & Cloud Computing Architecture   (15 Hrs)

Virtualization: Introduction - Characteristics of Virtualized Environments - Taxonomy of Virtualization Techniques - Virtualization and Cloud Computing - Pros and Cons of Virtualization, Cloud Computing Architecture : Introduction - Cloud Reference Model - Types of Clouds - Economics of the Cloud - Open Challenges.

UNIT III: Concurrent and High-Throughput Computing   (15 Hrs)

Concurrent Computing: Thread Programming : Introducing Parallelism for Single Machine Computation - Programming Applications with Threads, High-Throughput Computing: Task Programming : Task Computing - Task-based Application Models.

UNIT IV: Cloud Platforms and Applications   (15 Hrs)

Cloud Platforms in Industry: Amazon Web Services - Google AppEngine - Microsoft Azure – Observations, Cloud Applications: Scientific Applications - Business and Consumer Applications.

UNIT V: Advanced Topics in Cloud Computing   (15 Hrs)

Advanced Topics in Cloud Computing: Energy Efficiency in Clouds - Market Based Management of Clouds - Federated Clouds / InterCloud - Third Party Cloud Services.

SELF STUDY:

UNIT 1: Introduction : Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments - Computing Platforms and Technologies, Principles of Parallel and Distributed Computing: Eras of **Computing.**

UNIT4: Cloud Applications: Scientific Applications - Business and Consumer Applications.

TEXT BOOK

Mastering cloud computing,RajkumarBuyya, Christian Vecchiola&S.Thamaraiselvi, McGraw Hill Education, Pvt. Ltd., 2016.

Chapters: 1, 2, 3.1 – 3.5, 4, 6.1, 6.2, 7.1, 7.2, 9, 10, 11

REFERENCES:

1. ***Cloud Computing A Practical Approach,*** Anthony T.Velte, Toby J. Velte, Robert Elsenpeter Tata-McGraw- Hill, New Delhi, 2010.
2. ***Distributed Systems Concepts and Design***, George Coulouris, Jean Dollimore, Tim Kindberg, 5th Edition, Pearson Education Asia, 2012.
3. ***Boris Lublinsky***, Kevin T. Smith, Alexey Yakubovich, ProfessionalHadoop Solutions, Wrox, Wiley, 2013.
4. ***Distributed and Cloud Computing From Parallel Processing to the Internet of Things***, Kai Hwang, Geofrey C. Fox and Jack J. Dongarra, 1st Edition, Elsevier Science Publication, 2013.

Digital Open Educational Resources (DOER)

1. https://www.networkworld.com/article/2212919/the-key-concepts-of-cloud-computing.html
2. https://www.esds.co.in/blog/cloud-computing-basic-concepts/#sthash.Gfm5LMfP.dpbs
3. https://www.guru99.com/cloud-computing-for-beginners.html

Levels	C1 T1 10 Mks.	C2 T2 10 Mks.	C3 Seminar 5 Mks.	C4 Assignment 5 Mks	C5 OBT/PPT 5 Mks	Total Scholastic Marks 35 Mks.	Non Scholastic Marks C6 5 Mks.	CIA Total 40Mks.	% of Assessment
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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

OURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Identify and use different cloud computing services.	K1/K2	PSO1& PSO2	PO1
CO 2	Explain the basic principles of cloud virtualization.	K1/K2	PSO3& PSO4	PO1
CO 3	Prepare the appropriate cloud computing solutions to meet the requirement of specific applications.	K2/K3	PSO5	PO3
CO 4	Design application by utilizing cloud platforms such as Google app Engine and Amazon Web Services.	K3/K4	PSO6	PO4

CO 5	Analyze different cloud programming models.	K2/K4	PSO7	PO2

Mapping COs Consistency with PSOs

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

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.S.ArulJothi

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	19PG3BE10	ADVANCED COMPUTER GRAPHICS & ANIMATION	LECTURE	5	5

COURSE DESCRIPTION

To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations.

COURSE OBJECTIVES

- To understand the basics of geometry processing.

- To understand the fundamentals of pipelined rasterization rendering of meshed objects and curved surfaces.
- To understand and work with advanced rendering methods such as radiosity.
- To design programs for advanced animation methods and
- To become proficient at graphics programming using OpenGL

UNITS

UNIT I: Output Primitive Of Attributes   (15 Hrs)

Points and Lines – Line-drawing algorithms – Loading the frame buffer – Line function – Circle-generating algorithms – Ellipse-generating algorithms – Other curves – Parallel curve algorithms – Curve functions – Pixel addressing – Filled-area primitives – Line attributes – Curve attributes – Color and grayscale levels – Area-fill attributes – Character attributes.

UNIT II: Two-Dimensional Geometric Transformations   (15 Hrs)

Basic Transformations – Matrix representations – Composite transformations – Other transformations – Transformations between coordinate systems.

UNIT III: Two-Dimensional Viewing   (15 Hrs)

The viewing pipeline – Viewing coordinate reference frame – Window-to-viewport coordinate transformation - Two-Dimensional viewing functions – Clipping operations – Point clipping – Line clipping – Polygon clipping – Curve clipping – Text clipping.

UNIT IV: Introduction To Animation, Interpolation   (15 Hrs)

Perception – The heritage of animation – Animation production – Computer Animation production – A Brief history of computer animation – Interpolation – Controlling the motion of a point – Interpolation of orientations.

UNIT V: Interpolation-Based Animation   (15 Hrs)

Key-frame systems – Animation languages – Deforming objects – Morphing.

SELF STUDY:

UNIT I: Output Primitive: Color& grayscale levels, Area-fill attributes, Character attributes.
UNIT II: Two-Dimensional Geometric Transformations   :   Basic Transformations– Matrix representations
UNIT III: Two-Dimensional Viewing Window-to-viewport coordinate transformation
UNIT IV: Introduction To Animation, Interpolation : Controlling the motion of a point.
UNIT V: Interpolation-Based Animation: Deforming objects

TEXT BOOKS

1. ***Computer Graphics***, Donald D. Hearn, M. Pauline Baker, 4th Edition, Pearson Education Publication, 2014.

   Chapters: 3.1 – 3.11, 4.1 – 4.5, 5.1 – 5.5, 6.1 – 6.10

2. ***Computer Animation-Algorithms and Techniques***, Rick Parent, Morgan Kaufman Publishers, 2nd Edition, 2009.

   Chapters: 1, 3.1 – 3.2, 4.1 – 4.3,4.5

REFERENCES:

1. ***Computer Graphics, Multimedia and Animation***, Malay K.Pakhira, 2nd Edition, PHI Learning Pvt. Ltd., 2010.
2. ***Interactive Computer Graphics: A top-down approach with OpenGL***, Edward Angel and Dave Shreiner, 6th Edition, Addison Wesley, 2012.
3. ***Computer Graphics Principles and Practice***, Foley, Van Dam, Feiner, Hughes, 3rd Edition, C. Addison Wesley, 2014.

Digital Open Educational Resources (DOER)

1. https://en.wikipedia.org/wiki/Computer_graphics
2. http://what-when-how.com/advanced-methods-in-computer-graphics/introduction-to-advanced-methods-in-computer-graphics/
3. https://inst.eecs.berkeley.edu/~cs294-13/fa09/

COURSE CONTENTS & LECTURE 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 %**

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

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Explain the basic concepts in computer graphics.	K2	PSO1& PSO2	PO1

CO 2	Analyze various algorithms and to convert the basic geometrical primitives.	K2, K3	PSO3& PSO4	PO2
CO 3	Demonstrate the importance of viewing and clipping.	K2, K4	PSO5	PO4
CO 4	Discuss the fundamentals of animation	K2, K3 & K4	PSO6	PO2
CO 5	Describe Interpolation-Based Animation	K3& K5	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	2
CO2	1	1	3	3	1	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	1	3	1
CO5	2	2	2	2	1	1	3

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.S.ArulJothi

                                                        Forwarded By

                                              (signature)

                                                  (Dr.G.Germine Mary)

                                                  HOD'S Signature & Name

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
SPB	19PG3BE11	BIG DATA ANALYTICS	LECTURE	5	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   (15 Hrs)

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 jst 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.

UNIT II : BIG DATA ANALYTICS   (15 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.

UNIT III: THE BIG DATA TECHNOLOGY   (15 Hrs)

   The Big Data Technology Landscape:– Hadoop. Features of Hadoop. Key advantages of Hadoop, Version ofHadoop- Overview of hadoop Ecosystems- Hadoopdistributios- Hadoopverus 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.

UNIT IV :INTRODUCTION TO MAP REDUCE PROGRAMMING(15 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.

UNIT V: RECOMMENDATION ENGINES   (15 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 II

TEXT BOOK

1. *Big Data and Analytics*, Seema Acharya and Subhashini Chellappan, 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

REFERENCE BOOKS

1. *Big Data Strategies* , Pam Baker ,1st edition , Cengage Learning India Private Limited, 2016.
2. *Big Data,*Dr. Anil Maheshwari, 1stedition , Published by McGraw Hill Education (India) Private Limited, 2017.
3. *Big Data Fundamentals Concepts, Driver & Techniques,* Thomas Erl,WajidKhattak and Paul Buhler, 3rd Edition, Pearson publication, 2018.

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/big_data_analytics/index.htm
2. https://www.youtube.com/watch?v=OP8BsGnqi9c
3. https://www.youtube.com/watch?v=zez2Tv-bcXY

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

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

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Explain Characteristics and challenges of Big Data	K1	PSO1& PSO2	PO1
CO 2	Describe Big Data Analytics	K1,K2	PSO3& PSO4	PO2
CO 3	Utilize Hadoop for Big Data Technologies	K1K2	PSO5	PO3
CO 4	Demonstrate MAP REDUCE Programming	K3,K4	PSO6	PO4
CO 5	Describe types of Recommendation Systems using Big Data Analytics.	K1,K2	PSO7	PO4

Mapping COs Consistency with PSOs							
CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	1	2	1	2	3	2	2
CO2	2	1	3	2	1	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	1	3	1

CO5	2	2	2	2	2	1	3

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:

Dr.T.Vasantha

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II MSC COMPUTER SCIENCE
SEMESTER - III
(For those who join in 2022 onwards)

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	22PG3BE12	CYBER FORENSICS	LECTURE	5	5

COURSE DESCRIPTION
This course provides the investigation of computer-related crimes with the goal of obtaining evidence to be presented in a court of law.

COURSE OBJECTIVE
❖   Understand the definition of computer forensics fundamentals.
❖   Describe the types of computer forensics technology.

❖   Analyze various computer forensics systems.
❖   Learn to duplicate and preserve digital evidence.

UNIT – I COMPUTER FORENSICS FUNDAMENTALS   (15 Hours)

Introduction - Use in Law Enforcement - Assistance to Human Resources - Services - Benefits of Forensics Methodology - Steps Taken by Specialists – Users of Computer Forensic Evidence - Types of Computer Forensics Technology - Military Forensic Technology - Types of Law Enforcement - Types of Business Technology - Specialized Forensics Techniques - Hidden Data - Spyware and Adware - Encryption Methods and Vulnerabilities - Protecting Data - Internet Tracing Methods - Security and Wireless Technologies - Avoiding Pitfalls with Firewalls.
SELF STUDY : Biometric Security Systems

UNIT II COMPUTER FORENSICS EVIDENCE AND CAPTURE   (15 Hours)

Data Recovery -Definition - Data Backup and Recovery – Data Recovery Solution - Hiding and Recovering Hidden Data - Evidence Collection and Data Seizure – Obstacles - Types - Rules - Volatile Evidence - Methods of Collection - Artifacts - Collection Steps - The Chain of Custody - Reconstructing the Attack – Preservation of Digital Evidence and Digital Crime Scene - Computer Evidence Processing Steps – Legal Aspects - Computer Image - Verification and Authentication- Special Needs of Evidential Authentication.
SELF STUDY : Controlling Contamination, The Chain of Custody

UNIT III COMPUTER FORENSICS ANALYSIS   (15 Hours)

Discovery of Electronic Evidence - Electronic Document Discovery: A Powerful New Litigation Tool - Identification of Data - Timekeeping - Forensic Identification and Analysis of Technical Surveillance Devices - Reconstructing Past Events - How to Become a Digital Detective - Useable File Formats - Unusable File Formats - Converting Files - Networks - Network Forensics Scenario - A Technical Approach - Destruction of Email – Damaging Computer Evidence - Tools Needed for Intrusion Response to the Destruction of Data.
SELF STUDY : System Testing

UNIT IV THE IW ARSENAL AND TACTICS OF THE MILITARY   (15 Hours)

Overview of Military Tactics - Offensive Ruinous IW Tools and Tactics – Offensive Containment IW Tools and Tactics - Defensive Preventive IW Tools and Tactics – Defensive Ruinous IW Tools and Tactics - Defensive Responsive Containment IW Tools and Tactics - Countering Sustained Terrorist IW Tactics - Dealing with Random Terrorist IW - The Future of Information Warfare Arsenal – Weapons of the Future - The Global Positioning System - Snoop, Sniff, and Snuff Tools - Email Wiretaps Like Carnivore Can Steal Sensitive Correspondence - IW Weapons of the Future.
SELF STUDY : Nanotechnology

UNIT V SURVEILLANCE TOOLS FOR IW OF THE FUTURE   (15 Hours)

Monitoring Everything - The Cyber Footprint and Criminal Tracking - The Implications of Cookies and Integrated Platforms - Wintel Inside, or How Your Computer Is Watching You - Data Mining - The Internet Is Big Brother - The Wireless Internet: Friend or Foe - Advanced Computer Forensics - Advanced Encryption: The Need to Conceal - Advanced Hacking - Advanced Tracker Hackers - The Problems of

REFERENCES :
1.   John R. Vacca, "Computer Forensics: Computer Crime Scene Investigation", Second Edition , 2005.
2.   Kevin Mandia, Chris Prosise, Matt Pepe, "Incident Response and Computer Forensics ", Tata McGraw -Hill, New Delhi, 2014.
3.   Nelson Phillips and EnfingerSteuart, "Computer Forensics and Investigations",Cengage Learning, New Delhi, 2016.
4.   Bill Nelson, Amelia Phillips, Chris Steuart,"Guide to Computer Forensics and Investigations processing Digital Evidence", Fifth Edition, Tata McGraw - Hill, New Delhi, 2016.

WEB REFERENCES:
1.   https://homelandforensics.com/forensics.htm
2.   https://en.wikipedia.org/wiki/Computer_forensics

Levels	C1	C2	C3	C4	C5	Total Scholastic Marks	Non Scholastic Marks C6	CIA Total	A
	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	
K3	2	2	-	5	-	9	-	9	
K4	2	2	-	-	5	9	-	9	

K5	2	2	5	-	-		9	-	9
Non Scholastic	-	-	-	-	-			5	5
Total	10	10	5	5	5	35	5	40	

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember, **K2-**Understand, **K3-**Apply, **K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

SCHOLASTIC					NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	C6	CIA	ESE	Total
10	10	5	5	5	5	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	POs ADDRESSED
CO 1	Predict the forensics fundamentals and the various technologies used to avoid computer crimes	K2, K4	PSO1 & PSO3	PO1
CO 2	Illustrate different methods to collect and preserve digital evidence and Digital Crime Scene.	K2, K3, K4	PSO2 & PSO5	PO3

CO 3	Identify and Analyze Forensic Technical Surveillance Devices.	K2 , K4	PSO3 & PSO4	PO4
CO 4	Evaluate the Various tools and tactics followed in military.	K2, K3,K4& K5	PSO2 & PSO4	PO3
CO 5	Demonstrate the Usage of surveillance tools for tracking cyber criminals	K2,K3,K4& K5	PSO2 & PSO5	PO4

Mapping COs Consistency with PSOs

CO/PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	3	1	2	2	2	2
CO2	1	1	2	3	1	1	1
CO3	2	2	2	2	2	1	1
CO4	2	2	2	2	2	3	2
CO5	2	2	2	2	2	1	3

Mapping COs Consistency with POs

CO/PO	PO1	PO2	PO3	PO4

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:
Dr.P.Meenakshi Sundari

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II MSC COMPUTER SCIENCE
SEMESTER – III
(For those who join in 2022 onwards)

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/ WEEK	CREDITS
PSCS	22PG3BE13	MOBILE COMMUNICATION	LECTURE	5	5

COURSE DESCRIPTION
COURSE DESCRIPTION
        This course provides knowledge on key mobile system and wireless communication. It also aims at developing applications using Android

COURSE OBJECTIVE

   ❖ To learn the basic concepts of MAC, SDMA, TDMA, FDMA, CDMA.
   ❖ To have an exposure about GSM and Satellites.

- ❖ To be familiar with wireless protocols, WLAN, Bluetooth.
- ❖ To be acquainted with the Mobile Internet Protocol.
- ❖ To understand the basic concepts of SIP.

UNIT – I INTRODUCTION (15 Hours)

Applications - History of wireless communication - Simplified reference model- Medium Access Control - Motivation for a specified MAC- SDMA-FDMA- TDMA- CDMA – Comparison of SDMA, TDMA, FDMA, CDMA.
SELF STUDY: History of wireless communication

UNIT – II Mobile Networks (15 Hours)

GSM - Mobile services- System Architecture- Protocols- Handover – Security -New data services – DECT – TETRA – Satellite systems – Introduction – Applications - Basics- Routing- Localization- Handover.
SELF STUDY: Satellite systems Basics

UNIT – III Wireless Systems (15 Hours)

Infra RedVs Radio transmission- Infrastructure and Adhoc Networks- IEEE 802.11 System Architecture - Protocol Architecture – Newer developments -Bluetooth- Architecture- Link manager Protocol – Security – SDP – IEEE 802.15.
SELF STUDY: Bluetooth

UNIT – IV Mobile IP (15 Hours)

Basics – IP Packet delivery – Tunneling and encapsulation – IP micro mobility support – Dynamic host configuration protocol – Mobile ad-hoc networks – Overview ad-hoc routing protocols.

UNIT – V SIP (15 Hours)

Introduction - VoIP Technology – SIP Overview – Network Elements – SIP System Architecture – SIP Basic call flow - SIP trapezoid – SIP Messaging – SIP Response Codes – SIP Headers.
SELF STUDY: SIP Headers

TEXT BOOK:

1. Mobile Communications, Jochen Schiller, 2nd Edition, PHI/Pearson Education, 2003.

REFERENCES:
1. Jochen Schiller, "Mobile communication", Second Edition, Pearson Education,12th Impression, 2013.
2. Hideki Imai, Mohammad Ghulam Rahman, "Wireless Communications Security", KazukuniKobara, Artech House, 2007

3. Steve S. Thomas, "Wireless Communications Security", Create Space Independent Publishing, 2010.
4. Jyrki T. J. Penttinen,"Wirelesss Communications Security Solutions for the Internet of Things", John Wiley & Sons Ltd, 2017

WEB REFERENCES:

1. https://www.tutorialspoint.com/session_initiation_protocol/session_initiation_protocol_introduction.htm
2. https://nsrc.org/wrc/data/2004/629197984427ef56fc2cd1/sanog4-aarati-voiptut.pdf
3. http://www.cse.psu.edu/~pdm12/cse545-s11/slides/cse545-voip.pdf

Levels	C1	C2	C3	C4	Total Scholastic Marks	Non Scholastic Marks C5	CIA Total	% of Assessment
	10 Mks	15 Mks	5+5=10 Mks .	10 Mks	45 Mks .	5 Mks .	50 Mks .	

K1	-	-	-	-	-		-	-
K2	-	5	5	2.5	12.5		12.5	25%
K3	5	-	-	5	10		10	20%
K4	5	5	-	2.5	12.5		12.5	25%
K5	-	5	5	-	10		10	20%
Non-Scho.	-	-	-	-	-	5	5	10%
Total	10	15	10	10	45	5	50	100%

CIA	
Scholastic	45
Non Scholast:	5
	50

✔ **All the course outcomes are to be assessed in the various CIA components.**

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy for MCA are :**

  K2-*Understand*, **K3**-*Apply*, **K4**-*Analyse, K5 – Evaluate*

EVALUATION PATTERN

SCHOLASTIC				NON - SCHOLASTIC	MARKS		
C1	C2	C3	C4	C5	CIA	ESE	Total
10	15	10	10	5	50	50	100

- **CIA Components**

				Nos			
C1	–	Test (CIA 1)		2*	-	10 Mks	
C2	-	Test (CIA 2)		1	-	15 Mks	
C3	-	Assignment / Open Book Test		2	-	10 Mks	
C4	-	Seminar		1	-	10 Mks	
C5	-	Attendance		1	-	5 Mks	

- •**The Average of two will be taken into account**

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Identify, Predict and Evaluate MAC, SDMA, TDMA, FDMA, CDMA	K1/K2/K3	PSO1& PSO2	PO1
CO 2	Demonstrate the architectures, challenges and solutions of Wireless communication	K1/K2/K3	PSO3& PSO4	PO1& PO2
CO 3	Assess the role of Wireless Networks in shaping the future internet.	K1/K2/K3/K4	PSO5	PO1 & PO2
CO 4	Design Mobile IP to support seamless and continuous Internet connectivity	K1/K2/K3	PSO6	PO3
CO 5	Design SIP to create, modify, and terminate a multimedia session over the Internet Protocol.	K1/K2/K3/K4	PSO7	PO4

Mapping COs Consistency with PSOs

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

Mapping of COs with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER

Dr.P.MeenakshiSundari

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.Sc. Computer Science

SEMESTER –III

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	19PG3BSI	Summer Internship/ Training/ Online Certification	PRACTICAL	-	3

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.

EVALUATION PATTERN

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

PG CIA COMPONENTS

C1 -	Report Review	-	15
C2 -	Conference participation	-	5
C3 -	Paper Presentation	-	10
C4 -	Online Course Completion	-	5
C5 -	Model Presentation	-	5
	Total	**-**	**40**

COURSE OUTCOMES (CO)

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	POs ADDRESSED

CO				
CO 1	Identify employment contacts leading directly to a full-time job following course completion	K2	PSO1& PSO2	PO2
CO 2	Create communication, interpersonal and other soft skills essential for the job interview process	K2, K3	PSO3	PO4
CO 3	Analyse the project requirements and engages in continuing professional development	K2, K4	PSO5	PO3
CO 4	Analyze a problem and identify the computing requirements appropriate to its solution.	K2, K3 & K4	PSO6	PO3
CO 5	Utilizing a new software tool.	K3& K5	PSO7	PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO 1	PS O2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	3	1	1	1	2	2
CO2	1	1	3	1	1	2	2
CO3	2	2	2	2	3	1	1
CO4	2	2	2	3	1	3	1
CO5	2	2	2	2	1	1	3

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Dr.G.Germine Mary

Forwarded By

(signature)

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.Sc. Computer Science

SEMESTER –IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	19PG4B16	PRINCIPLES OF INTERNET OF THINGS	TUTORIAL	-	4

COURSE DESCRIPTION

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

COURSE OBJECTIVES

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

UNITS

UNIT I: Introduction To Internet Of Things
Introduction- Physical Design of IoT – Logical Design of IoT – IoT Enabling technologies.

UNIT II: Domain Specific Iots
Introduction - Home Automation – Cities – Environment.

UNIT III: IoT and M2M
Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT.

UNIT IV: IoT Platforms Design Methodology
Introduction - IoT Design Methodology – Case Study.

UNIT V: Case Studies – Audrino Studio

TEXT BOOK

Internet of Things – A hands-on approach, ArshdeepBahga, Vijay Madisetti, Universities Press, 2015.

Chapters: 1.1 – 1.4, 2.1 – 2.4, 3.1 – 3.4, 5.1 – 5.3

REFERENCES:

1. *The Internet of Things: Connecting Objects,*HakimaChaouchi, Wiley Publishers, 2010.
2. *Internet of Things with the Arduino Yun, (Projects to help you build a world of smarter things*, Marco Schwartz, Packt Publishing, 2014.
3. *Internet of Things: Principles and Paradigms*, Adrian McEwen and Hakim Cassimally, John wiley and Sons, Led., 2014.
4. *The Internet of Things*, Samuel Greengard, MIT Press, 2015.

Digital Open Educational Resources (DOER)

1. https://en.wikipedia.org/wiki/Internet_of_things
2. https://www.oracle.com/in/internet-of-things/what-is-iot/
3. https://www.iotforall.com/what-is-internet-of-things
4. https://internetofthingsagenda.techtarget.com/definition/Internet-of-Things-IoT

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 %

CIA	
Scholastic	35
Non Scholastic	5
	40

✔ **The levels of CIA Assessment based on Revised Bloom's Taxonomy are:**

K1- Remember**, K2-**Understand**, K3-**Apply**, K4-**Analyse, **K5-**Synthesis

EVALUATION PATTERN

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

COURSE OUTCOMES (CO)

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING TO REVISED BLOOM'S TAXONOMY)	PSOs ADDRESSED	POs ADDRESSED
CO 1	Explain the basic concepts of IoT	K1	PSO1& PSO3	PO1
CO 2	Discuss physical and logical design of IoT enabled technologies	K2	PSO2 & PSO4	PO3
CO 3	Analyze how and where IoT can be applied	K3,K4	PSO5	PO4
CO 4	Compare M2M and IoT	K2	PSO6	PO3
CO 5	Describe the features of Python used for IoT implementation	K2	PSO7	PO4

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	3	1	3	1	1	2	2
CO2	1	3	1	3	1	2	2
CO3	2	2	2	2	3	2	2
CO4	2	2	2	2	2	3	1
CO5	2	2	2	2	1	1	3

Mapping COs Consistency with POs

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

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

♦ Weakly Correlated -**1**

COURSE DESIGNER:

Ms.N.Muthulakshmi

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

II M.Sc. Computer Science

SEMESTER –IV

For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	HRS/WEEK	CREDITS
PSCS	19PG4BPR	PROJECT	PRACTICAL	-	6

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					
SCHOLASTIC			MARKS		
C1	C2	C3	CIA	ESE	Total
10	10	20	40	60	100

PG CIA MARK COMPONENTS		
C1 -	Analysis & Design Review	- 10

C2 -	Coding & Testing Review	-	10
C3 -	Model Presentation	-	20
	Total	-	40

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Discuss project development and the associated business processes	K2	PSO1& PSO2	PO3
CO 2	Plan as an individual or in a team in development of technical projects.	K2, K3	PSO3	PO3
CO 3	Communicate with engineers and the community at large in written and oral forms.	K2, K4	PSO5	PO2
CO 4	Create effective communication skills for presentation	K2, K3 & K4	PSO6	PO4
CO 5	Analyse problems and formulate solutions	K3& K5	PSO7	PO3

Mapping COs Consistency with PSOs

CO/ PSO	PSO1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO1	1	3	1	1	2	2	2
CO2	2	1	3	3	1	2	2
CO3	2	2	2	2	3	1	1
CO4	2	2	2	2	1	3	1
CO5	2	2	2	2	1	1	3

Mapping COs Consistency with POs

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

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

COURSE DESIGNER:

Dr.G.Germine May

Forwarded By

(Dr.G.Germine Mary)
HOD'S Signature & Name

M.Sc. Computer Science
SELF-STUDY COURSES
For those who joined in 2019 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	CREDITS
PSCS	19PGBSL1	BIOINFORMATICS	TUTORIAL	5

COURSE DESCRIPTION

Basic concepts and techniques of Bioinformatics and biological database

COURSE OBJECTIVES

- To understand the basic techniques of Bioinformatics

- To understand the biological database
- To analyze the structures of DNA.

UNITS

UNIT I – INTRODUCTION & DATABASE
Introduction, reason for using Bioinformatics, skills required, pharmaceutical companies and bioinformatics, use of Bioinformatics. Database: introduction, sequence DB, structure DB, Molecular visualization, specialized sequence DB Genome mapping DB, Biological culture and stock Collection DB, information retrieval from biological DB, Search Engines, Access to distributed data, Integrated information retrieval-the entreZ system, Sequence DB beyond NCBI, Medical DB, Format vs content, Nucleic acid sequence format in data banks, The DB, The genbankflatfile: a discussion, Sequence submission tools, Bioinformatics Organizations.

UNIT II – SEQUENCE ALIGNMENT & DB SEARCHING
Introduction, Pairwise alignment, reason for multiple sequence alignment, The choice of matrices-either PAM & BLOSUM, Differences between PAM & BLOSUM, The evolutionary basis of sequence alignment, The modular nature of proteins, Optimal alignment methods, Subtitution scores and gap penalties, Statistical significance of alignment, DB similarity searching, Sequence similarity search with single query sequence, FASTA, BLAST, The BLAST and FASTA program, Low-complexity regions, Repetitive elements.

UNIT III: PREDICTIVE METHODS AND PROTEINS SEQUENCE
Framework, Masking repetitive DNA, DB searches, Genmark – coding region identification tool, Detecting functional sites in the DNA, Integrated gee parsing, Finding tRNA genes, Future prospectsIdentification of protein based on composition, Physical properties based on sequence, Secondary structure and folding classes, specialized structures of features.

UNIT IV: PLASMID MAPPING AND PRIMER DESIGN
Restriction Mapping, Primer Desin on the Web, Primer Design programs and software, Mac Vector, OMIGA, Vector NTI, Gene Construction Kit.

UNIT V: PROTEOMICS AND GENOMICS
Introduction, Human gene project, DNA microarray- genome chip, EST, Techniques involved in Proteomics nd Genomics, Pharmacogenomics. Bioinformatics software and its Applications: List of bioinformatics software.

TEXT BOOK
Fundamentals of Bioiformatics ,Harisha S, I.K. International Publishing Limited.

Chapters: 1,2,3,4,5,6,7,9

REFERENCES:

1. Bioinformatics: Databases and Sytems, by Stanley I.Letovsky
2. Bioinformatics Databases: Design, Implementation and Usage, Chapman & Hall/ CRC Mathematical Biology & Medicine), SorinDraghici

Digital Open Educational Resources (DOER)

1. https://www.intechopen.com/books/bioinformatics-updated-features-and-applications/bioinformatics-basics-development-and-future
2. https://global.oup.com/us/companion.websites/9780199936991/
3. https://www.igi-global.com/book/bioinformatics-concepts-methodologies-tools-applications/71953
4. https://www.sciencedirect.com/topics/computer-science/bioinformatics

EVALUATION PATTERN

INTERNAL	EXTERNAL
Assignment – 20 Marks Test – 20Marks	Objective – 20 Marks Essay Type Qns. – 40 Marks
Total – 40Marks	Total – 60Marks

COURSE OUTCOMES (CO)

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

NO.	COURSE OUTCOMES	KNOWLEDGE LEVEL (ACCORDING	PSOs ADDRESSED	

		TO REVISED BLOOM'S TAXONOMY)		POs ADDRESSED
CO 1	Describe the basic concepts of bioinformatics and biological database	K2	PSO1& PSO2	PO1
CO 2	Understand the sequences alignment and DB searching techniques.	K2, K3	PSO3& PSO4	PO2
CO 3	Understand the predictive methods and protein sequence	K2, K4	PSO5	PO2
CO 4	Analyze Plasmid Mapping and Primer Design	K2, K3 & K4	PSO6	PO3
CO 5	Explain Proteomics and Genomics	K3& K5	PSO7	PO1

Mapping COs Consistency with PSOs							
CO / PSO	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	3	3	1	1	1	2	2
CO 2	1	1	3	3	1	2	2
CO 3	2	2	2	2	3	1	1
CO 4	2	2	2	2	1	3	2
CO 5	2	2	2	2	1	1	3

Mapping of COs with POs

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

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

COURSE DESIGNER:

1. **Dr.P.Meenakshi Sundari**
2. **Ms.N.Muthulakshmi**

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

M.Sc. Computer Science

SELF-STUDY COURSES

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	CREDITS
PSCS	21PGBSL2	DEVELOPING WEB SERVICES	TUTORIAL	5

COURSE DESCRIPTION

To understand the concept of design and implementation in developing web services

COURSE OBJECTIVES

- To understand the Evolution and Emergence of Web Services
- To understand architecture and technologies behind the web services.
- To design and develop web services.
- To implement web services developer packages.
- To understand   the security concepts in web services.

UNITS

UNIT I INTRODUCTION

Introduction to Web Services : Basic Operational Model of Web Services - Core Web Services Standards- Industry Standards Supporting Web Services - Known Challenges in Web Services - Web Services Software and Tools
Building the Web Services Architecture : Web Services Architecture and Its Core Building Blocks -Tools of the Trade - Web Services Communication Models - Implementing Web Services -Developing Web Services-Enabled Applications

UNIT – II : SOAP

Developing Web Services Using SOAP: XML-Based Protocols and SOAP - Anatomy of a SOAP Message-SOAP Encoding-SOAP Message Exchange Model-SOAP Communication-SOAP Messaging - SOAP Bindings for Transport Protocols-SOAP Security-Building SOAP Web Services

UNIT III :WSDL

Description and Discovery of Web Services: Web Services Description Language (WSDL) : WSDL in the World of Web Services - Anatomy of a WSDL Definition Document - WSDL Bindings - WSDL Tools - Future of WSDL - Limitations of WSDL

Universal Description, Discovery, and Integration (UDDI): UDDI Registries -Programming with UDDI - Inquiry API -Publishing API - Implementations of UDDI - Registering as a Systinet UDDI Registry User - Publishing Information to a UDDI Registry - Searching Information in a UDDI Registry - Deleting Information from a UDDI Registry - Limitations of UDDI

UNIT IV - Exploring Java Web Services Developer Pack:

Introduction to the Java Web Services Developer Pack (JWSDP) : Java Web Services Developer Pack : Java XML Pack - Java APIs for XML - JavaServer Pages Standard Tag Library - Apache Tomcat Java WSDP Registry Server - ANT Build Tool - Downloading the Web Services Pack

XML Processing and Data Binding with Java APIs: Extensible Markup Language (XML) Basics : XML Syntax - Namespaces - Validation of XML Documents - Java API for XML Processing (JAXP) : JAXP -Uses for JAXP - JAXP API Model - JAXP Implementations - Processing XML with SAX -

Processing XML with DOM - XSL Stylesheets: An Overview - Transforming with XSLT -Threading - Java Architecture for XML Binding (JAXB) - Data Binding Generation - Marshalling XML - Unmarshalling Java - Other Callback Methods - Sample Code for XML Binding

UNIT V – Security in Web Services

Challenges of Securing Web Services : Technologies behind Securing Web Services - Rapid-Fire Cryptography , XML Encryption: Implementations of XML Encryption - XML Encryption - Encrypting XML Element - Decrypting the XML Element - Programming Steps for Encryption and Decryption, XML Signature : Types of XML Signatures - XML Signature Syntax -Canonicalization - Implementations of XML Signature - XML Signature: An Example, Security Assertions Markup Language (SAML): SAML Implementations- SAML Architecture- Authentication Assertion - Attribute Assertion -Authorization (Decision) Assertion- SAML Bindings and Protocols - Model of Producers and Consumers of SAML Assertions- Single Sign-On Using SAML

TEXT BOOKS

Developing Java™ Web Services, RameshNagappan Robert Skoczylas Rima Patel Sriganesh, Wiley Publishing Inc., Indianapolis, Indiana. 2003

REFERENCE BOOKS

1. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.
2. Building web Services with Java, 2nd Edition, S. Graham and others, Pearson Education.
3. Developing Enterprise Web Services, S. Chatterjee, J. Webber, Pearson Education.

Digital Open Educational Resources (DOER)

1. https://www.tutorialspoint.com/webservices/what_are_web_services.htm
2. https://docs.oracle.com/cd/E40938_01/doc.74/e40142/dev_secure_web_srvcs.htm

EVALUATION PATTERN

INTERNAL	EXTERNAL

Assignment – 20 Marks	Objective – 20 Marks
Test – 20Marks	Essay Type Qns. – 40 Marks
Total – 40Marks	Total – 60Marks

COURSE OUTCOMES (CO)

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

NO.	COURSE OUTCOME	KNOWLEDGE LEVEL(ACCORDING TO BLOOM'S TAXONOMY)	PSOS ADDRESSED	POS ADDRESSED
CO 1	Analyse the challenges in web services and understand the architectures behind the web services.	K1,K2	PSO1& PSO4	PO2
CO 2	Understanding the SOAP architecture in developing web services.	K1,K2	PSO3	PO1
CO 3	Efficiently use market leading environment tools to create and consume web services	K3,K4	PSO4 &PSO5	PO2
CO 4	Identify and select the appropriate framework components in creation of webservice solution	K1,K2	PSO6	PO3
CO 5	Analyse the challenges of security in web services.	K2,K3	PSO7	PO4

Mapping COs Consistency with PSOs

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

Mapping of COs with POs

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

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

♦ Weakly Correlated -**1**

OURSE DESIGNER:

  Dr.P.MeenakshiSundari

Forwarded By

(signature)

(Dr.G.Germine Mary)

HOD'S Signature& Name

M.Sc. Computer Science

SELF STUDY

For those who joined in 2021 onwards

PROGRAMME CODE	COURSE CODE	COURSE TITLE	CATEGORY	CREDITS
PSCS	21PGBSL3	**EVOLUTIONARY COMPUTING**	TUTORIAL	5

Provide evolutionary Computation and global optimization techniques.

- To solve various search and optimization problems
- To handle multi-objective optimization problems in their totality
- To Describe the Evolutionary algorithms and solve complex problem using evolutionary algorithms

UNITS

UNIT I – EVOLUTIONARY COMPUTING

Biological foundation of Evolutionary computing, Introduces evolutionary algorithms, a class of stochastic, population-based algorithms inspired by natural evolution theory, capable of solving complex problems for which other techniques fail

UNIT II – GENETIC ALGORITHMS (GA)

Biological foundation of GA, General steps in GA, Genetic Operations: cloning, crossover and mutation, Encoding and Selection techniques, Mathematical foundation and Schemata, Holland Schemata theorem, design and implementation of GA, issues in implementation of GA, applications of GA, Classifier systems, Genetic programming, new trends in GA. Applications of GA

UNIT III: SWARM INTELLIGENCE (SI)

Biological foundation of SI, SI Techniques: Ant Colony Optimization (ACO) and Particle Swarm optimization (PSO). General steps in ACO, the "Invisible Manager" (Stigmergy), the Pheromone, Ant Colonies and Optimization, Ant Colonies and Clustering, Applications of Ant Colony Optimization. Applications of ACO

UNIT IV: PARTICLE SWARM OPTIMIZATION (PSO)

Social Network Structure: The Neighborhood Principle, PSO Algorithm, Fitness Calculation, Convergence, PSO System Parameters, Particle Swarm Optimization versus Evolutionary Computing and Applications of PSO

UNIT V: FEW ALGORITHMS

Mimetic algorithm, Firefly Algorithm, multi objective algorithms

REFERENCE BOOKS

1. ***An introduction to Genetic Algorithms***, M. Mitchell, Prentice-Hall, 1998.
2. ***Genetic Algorithms in Search, Optimization, and Machine Learning***, D. E. Goldberg,Addison Wesley,1989.
3. ***Computational Intelligence -PC Tools***, P.Simpson and R.Dobbins, R.Eberhart,AP Professional, 1996.
4. ***Evolutionary Computation – A Unified Approach*** , Kenneth A.De.Jong, The MIT Press, 2016

Digital Open Educational Resources (DOER)

1. https://youtu.be/-WKZglCAQwE

2. https://youtu.be/L--IxUH4fac

3. https://youtu.be/qY6AO68cSrc

EVALUATION PATTERN

INTERNAL	EXTERNAL
Assignment – 20 Marks Test – 20Marks	Objective – 20 Marks Essay Type Qns. – 40 Marks

Total	– 40Marks	Total	– 60Marks

COURSE OUTCOMES (CO)

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	POs ADDRESSED
CO 1	Formulate a problem as an evolutionary computation search/optimization by specifying representations, selection and variation operators.	K1 & K2	PSO1& PSO2	PO1 & PO3
CO 2	Write a program or use a package to implement an evolutionary algorithm.	K3 & K4	PSO3 & PSO4	PO2
CO 3	Conduct evolutionary optimization experiments and properly report and discuss the results	K1 & K3	PSO4	PO3
CO 4	Apply various evolutionary computation methods and algorithms for particular classes of problems	K2 & K3	PSO5 & PSO6	PO2 & PO3
CO 5	Develop evolutionary algorithms for real-world applications.	K3 & K4	PSO7	PO4

Mapping COs Consistency with PSOs

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

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

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

♦ Weakly Correlated -**1**

Mapping of COs with POs

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

COURSE DESIGNER:

Dr.G.Germine Mary

Forwarded By

(Dr.G.Germine Mary)

HOD'S Signature & Name

Course For BOS From SWAYAM Thru' C :

1. Course in Information Technology
2. Art of C Programming
3. Artificial Intelligence
4. Communication Skills
5. Communication Technologies in Education

6. Basics of Photography

7. Computer Networks

8. Course in Information Technology

9. Critical Thinking

10. Cyber Security

11. Database and Content Organisation

12. Design and Analysis of algorithms

13. Design and Facilitation of E-Learning Courses

14. Designing Digital Solution

15. Development of Assistive technology for persons with Disabilities

16. Graph Theory

17. Graphics and Animation Development

18. Introduction To Film Studies

19. Operating Systems

20. Software Engineering

21. Learning Management System

22. Web Content Management

EXAMINER LIST

1. Dr. V.K. VIJAYAKUMAR   Head & Associate Professor, Dept of CSC, Sourashtra College, Madurai
2. Dr. T.D. VENKATESWARAN Associate   Professor,   Dept   of CSC,,Sourashtra College   , Madurai
3. Tmt. D.V. JEYANTHI   Assistant Professor, Dept of CSC, Sourashtra College, Madurai
4. Thiru. K.P. GNANESH Assistant Professor, Dept of CSC, Sourashtra College, Madurai
5. Ms. N. Jayachandra M.Sc., M.Phil., Ph.D. HOD, Dept of CSC,, Lady Doak College, Madurai.
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17. Mr.K.BrittoAlex,Head& Assistant Professor, Dept of IT, American College, Madurai.
18. Mr.J.FrankReubanJebaraj   Head & Associate Professor, Dept of Computer Applications, American College, Madurai.
19. Mr.J.FrankReubanJebaraj   Associate Professor, Dept. Of MCA, American College, Madurai.
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29. Mrs.S.M.Valli, Associate Professor &Head,Dept. of Computer Science,Thiagarajar College of Arts &Science,Madurai - 625 009.
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31. Mr. Jeyasudharsan, Lecturer (SG), Department of Computer Science, Thiagarajar College of Arts & Science, Madurai
32. Ms.Hema, Associate Professor , Department of Computer Science, Thiagarajar College of Arts & Science, Madurai
33. Ms.Baby Rani, Associate Professor, Department of Computer Science, Sri Meenakshi Govt. Arts College for Women, Madurai
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38. Mrs.M.Thajmin, Assistant Professor, , Dept.of Computer Science, MSS Wakf Board college, , Madurai-625020.
39. Mrs.J.Sukanya, Assistant Professor , Dept. of Computer Science, M.V.Muthiah Govt. Arts College for Women, Dindigul – 624 001.

LIST OF COMPANIES / ORGANIZATIONS

1. Pentaxial Technologies,
   157, Thiagarajar Colony, Pasumalai,
   Madurai-04.
   Cell: 7598339685
2. SEVEN ATARA Marketers,
   11-3/2, III street, Periyarnagar,
   Koodalnagar,
   Madurai - 625018
   Cell: 7010609203
3. The Silicon Harvest,
   80, Yanaikkal, Simmakkal,

Madurai-01.
Cell: 9443783583

4. Tera Technologies,
   142, North Veli Street,
   Madurai-01.Phone: 0452-631115

5. Sofia Infology,
   80, Yanaikkal road 2nd floor,
   Near Bridge, Yanaikkal,
   Madurai-01.Cell: 9842115801

6. Integrated Software Solution
   58, Goodshed street,
   Madurai-01Phone : 0452-4383028

7. Vela Technologies
   No.3, Krishna street,
   Ramamurthy Nagar, Vilangudi,
   Madurai-18.Cell: 9789339435

8. Embuzz Technologies Pvt. Ltd.,
   279/1, Maruthupandiar Nagar 4th st, Sourashtra Teachers Colony,
   Anupanady Road, Madurai- 09
   Cell: 9042575700

9. TechsatyamSoftwaresPvt. Ltd.,
   73, Ram Nagar, 3rd street,
   S.S.colony (Bye pass road), Madurai-16

10. Bigdbiz Solutions,
    8-10/5, Sindhunathi street, Mahatma Gandhi Nagar, Madurai.

11. DigiTargetz,
    311, Maruthupandiyar street, Anna nagar,
    Madurai-20.

12. Unique Technology,
    61, 4th street, West Ponnagaram, Madurai.

13. GV Solutions,
    5/45 A, MelaAnuppanadi,
    Madurai-09.
    Cell: 9790581045

14. F9 Consultancy Services,
    3/272, First right cross st,
    Surveyor Colony,
    Madurai.
    Ph: 0452-2343527

15. Sakthi Towers,
    12th East cross st,
    Anna nagar, Madurai-20
    Cell: 9789786906

16. INITI Solutions,
    2/73, MullaiVeethi, Sathasivanagar,
    Madurai-20
    Cell: 8124358665

17. GV Solutions,
    5/45 A, MelaAnuppanadi,
    Madurai-09.

Cell: 9790581045
18. VincInfotech,
     18, Sri Meenakshi Complex,
     Aathikulam main road,
      Reserve line,
     Madurai-14.
     Cell: 9940875339
19. EDM Soft Solutions Pvt. Ltd.,
     32, East cross st, Palanganatham,
     Madurai-03.
     Cell: 7397648836
     The Silicon Harvest,
20. Smart Digital Service,
     1, Jeevanagar,
     Pasumponnagar, Madurai-03.Cell: 9944332579
     Pinnacle Computing Solutions,
21. Alpha Infotech,
     346/3b, Thirumangalam main road,
     Pasumalai, Madurai-04.
     Cell: 9597565875
22. Future Focus Solutions,
     32, Vayakatu street,
     Goripalayam,Madurai-02.Cell: 9789616176
23. APEX Soft,
     Yogaapex Soft Technology Pvt.Ltd.,
     2, PudurVandipathai road,
     K.Pudur, Madurai-07.
24. Tera Technologies,
     142, North veli street,
     Madurai-01.