CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

NATIONALLY ACCREDITED WITH A^{+} GRADE BY NAAC

TIRUCHIRAPPALLI

PG DEPARTMENT OF INFORMATION TECHNOLOGY

M. Sc. INFORMATION TECHNOLOGY

SYLLABUS

2026-2027 and Onwards

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF INFORMATION TECHNOLOGY

Vision

The Department of Information Technology envisions to create technically competent, skilled intellectual IT professionals, efficient problem solvers, innovators and entrepreneurs to meet the current challenges of the modern computing industry.

Mission

➢ To provide quality education and elevate the students towards higher educational programs

➢ To encourage and guide the students to improve their competency skills in information technology market

➢ To equip the students to cater the industrial demands through providing advance training

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	**LEARNING ENVIRONMENT** To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	**ACADEMIC EXCELLENCE** To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	**EMPLOYABILITY** To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	**PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY** To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	**GREEN SUSTAINABILITY** To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR M.Sc. INFORMATION TECHNOLOGY PROGRAMME

PO NO.	Programme Outcome On completion of M.Sc. Information Technology The students will be able to
PO1	**DOMAIN KNOWLEDGE** Acquire the in-depth computing knowledge both conceptual and applied pertaining to the core discipline
PO2	**PROBLEM SOLVING** Procure knowledge-based skills to satisfy the needs of society and the industry by providing hands on experience of various technologies in Computer Science
PO3	**INNOVATION AND CRITICAL THINKING** Critically evaluate global issues, recognize the need and identify sustainable solutions through research capabilities towards Nation building initiatives
PO4	**LIFE LONG LEARNING** Capable of upgrading and advancing knowledge through innovation and technology as evidenced by current developments
PO5	**LEADERSHIP AND TEAMWORK** Work in collaborative environment through applications of scientific reasoning and communicate effectively to the stakeholders

PROGRAMME SPECIFIC OUTCOMES FOR M.Sc. INFORMATION TECHNOLOGY PROGRAMME

PSO No.	Programme Specific Outcomes Students of M.Sc. Information Technology will be able to	POs Addressed
PSO1	Acquiring in-depth knowledge of computing fundamentals and advanced topics in various information technology domains.	PO1
PSO2	Pursuing lifelong learning and research as computing professionals to meet industry standards and corporate demands by providing innovative solutions.	PO1 PO2
PSO3	Apply theoretical foundations and practical expertise in Information Technology to develop effective, efficient, and innovative real-time solutions that contribute to societal impact.	PO2 PO3
PSO4	Ability to adapt to rapidly evolving IT technologies and engage in continuous learning to stay current with industry trends and challenges.	PO3 PO4
PSO5	Demonstrate ability to collaborate, apply scientific principles, and communicate complex solutions to stakeholders	PO4 PO5

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

PG DEPARTMENT OF INFORMATION TECHNOLOGY

M. Sc INFORMATION TECHNOLOGY

CHOICE BASED CREDIT SYSTEM-LEARNING OUTCOME-BASED CURRICULUM FRAMEWORK (CBCS – LOCF)

(For the Candidates admitted from the Academic year 2026-2027 onwards)

Semester	Course	Course Title	Course Code	Inst. Hrs. / week	Credits	Exam			Total
						Hrs.	Marks		
							Int.	Ext.	
I	Core Course– I (CC-I)	Object Oriented Design and Pattern	26PIT1CC1	6	5	3	30	70	100
	Core Course – II (CC-II)	Advanced Database Management Systems	26PIT1CC2	6	5	3	30	70	100
	Core Practical –I (CP-I)	Advanced Database Management Systems(P)	26PIT1CP1	6	5	3	40	60	100
	Discipline Centric Elective Course-I (DCE-I)	A. Web Programming	26PIT1DCE1A	5	3	3	30	70	100
		B.Cloud Computing	26PIT1DCE1B						
		C.Distributed Technologies	26PIT1DCE1C						
	Generic Elective Course -I (GEC-I)	A. Web Programming(P)	26PIT1GEP1A	4	2	3	40	60	100
		B. Cloud Computing(P)	26PIT1GEP1B						
	Non-Major Elective Course -I (NMEC-I)	AI Tools for Human Resource Management – I(P)	26PIT1NMEP1	3	2	3	40	60	100
	Total			30	22				**600**

Semester I		Internal Mark: 30	External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1CC1	**Object Oriented Design and Pattern**	**Core Course – I (CC)**	**6**	**5**

Objectives:

- To understand the fundamentals of object design. and Pattern
- To understand and differentiate Unified Process from other approaches.
- To design with static UML diagrams and identify the concept.
- To design with the UML dynamic and implementation diagrams.
- To design the software with appropriate design patterns.
- To test the software against its requirements specification techniques of conceptual UML modeling.

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization/Environment and Sustainability/Human Values/Indian Knowledge System	Environment and Sustainability
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 9,11

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	To understand the interface between the classes and objects.	K1,K2
CO2	Build a model for the user interface (UI) for a software application	K2,K3
CO3	To understand the GUI Pattern	K3,K4
CO4	Gain exposure from frameworks and thread	K5
CO5	Create class diagrams that model both the domain and design model of a software system.	K6

Mapping of CO with PO and PSO

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

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	INTRODUCTION TO UML: Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modelling, Principles of modelling, Object oriented modelling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle. BASIC STRUCTURAL MODELING: Classes: Terms and concepts, Common modelling techniques; Relationships Modelling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams. ADVANCED STRUCTURAL MODELING: Advance classes, Advance relationships, Interfaces, Types and Roles, Packages, Instances.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	THE OBJECT-ORIENTED DESIGN PROCESS: The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using Java doc for design documentation, Case Study: A voice mail system.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

III	GUIDELINES FOR CLASS DESIGN: An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing. INTERFACE TYPES AND POLYMORPHISM: The icon interface type, polymorphism, drawing shapes, the comparable interface type, the comparator interface type, anonymous classes, frames and user interface components, user interface actions, timers, designing an interface type.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	PATTERNS AND GUI PROGRAMMING: Iterators, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns to work. INHERITANCE AND ABSTRACT CLASSES: The concept of inheritance, graphics programming with inheritance, abstract classes, the template method pattern, protected interfaces, the hierarchy 18 of swing components, the hierarchy of standard geometric shapes, the hierarchy of exception classes, when not to use inheritance.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	FRAMEWORKS: Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework. MULTITHREADING: Thread basics, Thread synchronization, Animations. MORE DESIGN PATTERNS: The Adapter pattern, Actions and the command pattern, the factory method pattern, the proxy pattern, the singleton pattern, the visitor pattern, other design patterns.	18	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	**Self Study for Enrichment** UML - Examples on: Behavioural models – Structural models – Architectural models from real world problems. **Case Study**-Student Admission System-Banking Systems	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TEXT BOOKS

1.Grady Booch, James Rumbaugh, Ivar Jacobson (2009), The Unified Modeling Language User guide, 2nd edition, Pearson Education, New Delhi, India.

2.Cay Horstmann (2004), Object-Oriented Design and Patterns, Wiley India edition, New Delhi, India.

REFERENCES BOOKS:

1. Grady Booch, Michael W. Engel, Kelli A. Houston, Robert A. Maksimchuk, Bobbi J. Young, Jim Conallen, "Object-Oriented Analysis and Design with Applications", 3rd Edition, Pearson Education, 2009
2. Michael Blaha and James Rumbaugh, "Object-Oriented Modeling and Design with UML", 2nd Edition, Pearson Education,2005
3. Erich Gamma, Richard Helm, Ralph Johnson & John Vlissides, "Design Patterns:
4. Elements of Reusable Object-oriented Software", Pearson Education India, 2004.

Web reference

1. https://webreference.com/php/object-oriented/design-patterns/
2. https://www.oodesign.com/
3. https://learn.ni.com/courses/applying-design-patterns-and-object-reference-oop

Course Designer

Dr.J.Sangeetha , Associate Professor, Information Technology

Semester I	Internal Mark: 30		External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1CC2	**Advanced Database Management systems**	**CORE COURSE II**	**6**	**5**

Course Objectives

- Deepen knowledge on advanced relational database concepts.
- Explore query processing, optimization, concurrency & recovery.
- Understand distributed, parallel, object & emerging database models.
- Provide hands-on experience in advanced SQL & transaction systems.
- Prepare students for research and industry-level DB technologies.

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Understand the principles of SQL, and advanced database features	K1, K2
CO2	Apply advanced SQL techniques, triggers, stored procedures, indexing, and query optimization	K3
CO3	Analyze query processing strategies, indexing structures, concurrency control & recovery mechanisms	K4
CO4	Evaluate database architectures, including centralized, client-server, parallel & distributed systems	K5
CO5	Apply advanced database technologies in real-world data management scenarios	K5, K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	1	3	2	1	2	1
CO2	3	2	3	2	1	3	3	2	2	1
CO3	3	3	2	3	2	3	3	3	2	2
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	2	3	3	2	3	2

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

SYLLABUS

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	**Database System–** Purpose of Database Systems – Characteristics of Database Approach -Applications – Database Users and Administrator – Database Architecture – Data Models – Schema and Instances – Introduction to Relational Model. **Intermediate and Advanced SQL:** Joins and Subqueries – Views and Indexed Views – Transactions and Concurrency Control – Integrity Constraints – Functional Dependencies – **Normalization** (1NF, 2NF, 3NF, BCNF) – Stored Functions, Procedures and Triggers.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
II	**Indexing and Hashing:** Basic Concepts - Ordered Indices - B+-Tree Index Files - B+-Tree Extensions - Multiple-Key Access - Static Hashing - Dynamic Hashing - **Transactions** - Transaction Concept - A Simple Transaction Model - Transaction Atomicity and Durability - Transaction Isolation – Serializability - Transaction Isolation and Atomicity - Transaction Isolation Levels.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
III	**Concurrency Control** - Lock-Based Protocols - Deadlock Handling - Multiple Granularity - Timestamp-Based Protocols - Validation-Based Protocols - Concurrency Control-Recovery System - Failure Classification – Storage.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
IV	**Parallel Databases** – Introduction - I/O Parallelism - Interquery Parallelism - Intraquery Parallelism - Intraoperation Parallelism - Interoperation Parallelism. **Overview of PL/SQL-**Structure of PL/SQL block, Advantages of PL/SQL, Variables, Constants, Data types, Operators, Scope and visibility of variables.	18	CO1 CO2 CO3 CO4 CO5	K1 K2 K3 K4 K5 K6
V	**Introduction to NoSQL databases** – Types - Data Modelling – CRUD operations and Querying – Data Modeling and Design Pattern – Transaction and Concurrency – NoSQL in real world		CO1, CO2, CO3,	K1 K2 K3

	scenario	18	CO4, CO5	K4 K5 K6
VI	**Self-Study for Enrichment** **(Not included for End Semester Examinations)** Query Optimization – Recovery system - Early Lock Release and Logical Undo Operations - ARIES** - Remote Backup Systems.	-	CO1, CO2, CO3, CO4, CO5	K1 K2 K3 K4 K5 K6

Text Book

1. Database System Concepts, Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Seventh Edition, McGraw-Hill Publication,2019
2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition.
3. Oracle PL/SQL Programming, Steven Feuerstein and Bill Pribyl O'Reilly Media 2014 (6th Edition)
4. Mastering NoSQL A Comprehensive Guide to Learn NoSQL, Cybellium, 2023

Reference Book

1. Advanced Database Management System by RiniChakrabarti, ShilbhadraDasgupta, Dreamtech Publication, 2020
2. Fundamentals of Database Systems, Elmasri Navathe Pearson Education.
3. An Introduction to Database systems, C.J. Date, A.Kannan, S.Swami Nadhan, Pearson, Eight Edition

Web References

1. https://nptel.ac.in/courses/106106220
2. https://www.coursera.org/learn/database-management
3. https://www.w3schools.in/dbms/database

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar

Course Designer

Dr. M.Ellakkiya, Associate Professor, Department of Information Technology.

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1CP1	**Advanced Database Management Systems (P)**	**CORE PRACTICAL - I**	**6**	**5**

Course Objectives

- Provide hands-on experience in fundamental and advanced SQL, covering data definition, manipulation, joins, sub-queries, and view creation.
- Impart practical skills in database performance tuning, including indexing and query optimization using execution plans.
- Develop proficiency in procedural SQL (PL/SQL) for implementing stored procedures, functions, cursors, and triggers to enforce complex business logic.
- Enable students to practically demonstrate and analyze core concepts of transaction management, concurrency control, and system recovery.

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Apply fundamental and advanced SQL (CRUD, Joins, Sub-queries, Views) for effective data retrieval and management	K3
CO2	Analyze and optimize query performance by creating and evaluating indexing strategies using tools like EXPLAIN	K4
CO3	Implement procedural constructs (PL/SQL) including stored procedures, functions, and triggers to automate database tasks.	K3
CO4	Demonstrate and analyze transaction properties, concurrency control (locking), and database recovery simulation.	K4
CO5	Simulate and analyze database recovery system functionalities, including the management of undo/redo logs and checkpoints to ensure data resilience.	K5, K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	3	2	1	3	2	1	2	1
CO2	3	2	3	2	1	3	3	2	2	1
CO3	3	3	3	3	2	3	3	3	3	2
CO4	3	3	3	3	2	3	3	3	3	2
CO5	3	3	3	3	2	3	3	3	3	2

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

EXERCISES

1. Set up DB, create tables, perform basic CRUD, simple queries
2. Implement joins, set operations, aggregates, views.
3. Implement Sub queries and nested queries
4. Query Processing & Cost Estimation
    a. EXPLAIN
5. Create single column and composite indexes
    a. Use EXPLAIN to see index usage
    b. Drop index and compare timings
6. Demonstrate atomicity, commit/rollback, savepoints.
7. PL/SQL Basics
8. Stored Procedures & Functions
9. Cursors & Triggers
10. PL/SQL Packages & Bulk Operations
11. Install MongoDB and Perform CRUD and querying operations
12. Design Library Management System database for your department library

WEB REFERENCES

1. https://www.dbvis.com/thetable/sql-explain-the-definitive-tool-to-optimize-queries
2. https://www.geeksforgeeks.org/sql
3. https://www.tutorialspoint.com/plsql/index.htm

PEDAGOGY

Chalk and Talk, Power Point Presentation, Demo

COURSE DESIGNER

Dr.M.Ellakkiya. Associate Professor, Department of Information Technology

Semester I	Internal Mark: 30		External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1DCE1A	A. Web Programming	Discipline Centric Elective Course – I	5	3

Course Objectives

- To provide foundational and advanced knowledge in client-side and server-side web programming
- To enable them to develop dynamic web applications

S.No	Course Features	Relevance Status
1.	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability, Entrepreneurship, Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics, Cyber Security, Environment & Sustainability
3.	Course relevant to Local/Regional/National/Global needs	Global Needs
4.	Course focus on Sustainable Development Goals	SDG 4, 8, 9 & 12

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the fundamental concepts, syntax, and structure of HTML, CSS, JSON, jQuery, AJAX, React, and Node.js	K1, K2
CO2	Describe and apply the working principles of client-side and server-side web technologies including AJAX communication, React components, and Node.js architecture	K2
CO3	Apply HTML, CSS, jQuery, AJAX, React, and Node.js techniques to develop dynamic and responsive web applications	K3
CO4	Analyze the interaction between frontend and backend technologies to design efficient web solutions using React and Node.js	K3, K4
CO5	Develop and evaluate a full-stack web application integrating client-side and server-side technologies	K5, K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2	2	2	3	3	1
CO2	3	2	3	2	2	3	3	2	3	2
CO3	3	3	3	2	2	3	3	2	3	3
CO4	3	2	3	2	3	2	3	3	3	2
CO5	3	3	3	3	3	3	3	2	2	3

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

SYLLABUS

UNIT	CONTENTS	HOURS	COs	COGNITIVE LEVEL
I	**HTML:** Introduction to Web Technologies - Structure of HTML Document - Lists, Tables, Hyperlinks - Images and Multimedia - Forms and Form Controls - Semantic Elements **CSS:** Introduction to CSS - Inline, Internal and External CSS - Selectors and Properties - Box Model - Backgrounds, Borders, Margins, Padding - Positioning and Display.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	**JSON:** Introduction to JSON - JSON Syntax and Data Types - JSON Objects and Arrays - Parsing and Stringifying JSON - JSON and JavaScript Integration. **JQuery:** Introduction to jQuery - jQuery Selectors - DOM Manipulation - Event Handling - Effects and Animations - jQuery with JSON	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	**AJAX:** Introduction to AJAX - Synchronous vs Asynchronous Communication - XMLHttpRequest Object -AJAX with jQuery - Fetch API - Working with JSON in AJAX - Error Handling	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	**React:** Introduction to React - Features of React - Setting up React Environment – JSX - Components (Functional Components) - Props and State - Hooks (useState, useEffect) - Event Handling in React - Conditional Rendering - Lists and Keys	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5. K6

V	**Node.js:** Introduction to Node.js - Node.js Architecture - Node Package Manager (NPM) - Creating Web Server using HTTP Module - File System Module - Introduction to Express.js – Routing - Handling JSON Data - Basic REST API Development	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
VI	**Self Study for Enrichment** (Not included for End Semester Examination) HTML5 Elements and Attributes - Text Formatting Tags - Flexbox Basics - Responsive Web Design - Media Queries	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TEXT BOOKS

1. DT Editorial Services. HTML5 Black Book , 2ndEdition, Dream Tech Press, New Delhi. 2016
2. Robin Wieruch. The Road to React: With React 18 and Hooks, 2024 Edition, Independently Published, 2024
3. Basarat Ali Syed. Beginning Node.js, 1st Edition, Apress, New York, 2014

REFERENCE BOOKS

1. Jon Duckett. HTML & CSS: Design and Build Websites, 1st Edition, Wiley, New York, 2011
2. Nicholas C. Zakas. Professional JavaScript for Web Developers, 3rd Edition, Wrox Publications, Indianapolis, 2012
3. Eric Elliott. Programming JavaScript Applications: Robust Web Architecture with Node, React, and MongoDB, 1st Edition, O'Reilly Media, Sebastopol, 2014

WEB REFERENCES

1. **https://www.w3schools.com/html/**
2. **https://www.w3schools.com/xml/ajax_intro.asp**
3. **https://react.dev/learn**
4. **https://www.w3schools.com/react/**
5. **https://nodejs.org/en/docs/**

PEDAGOGY

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

COURSE DESIGNER

Ms. V. Infine Sinduja, Associate Professor, Department of Information Technology

Semester I	Internal Mark: 30		External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1DCE1B	**B. Cloud Computing**	**Discipline Centric Elective Course– I**	**5**	**3**

Course Objectives

- To learn about the basic concepts in Cloud Computing
- To know about Cloud infrastructure mechanisms and cloud service management
- To describe the cloud computing architecture design principles
- To understand the role of virtualization in building an efficient cloud architecture
- To identify and discuss cloud security threats

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9,12

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	To define the core concepts of cloud computing paradigm, characteristics, advantages, challenges and threats from various cloud computing models and services	K1, K2
CO2	To identify the cloud computing, models, services, techniques and applications with different cloud architectures	K2, K3
CO3	To apply the fundamental concepts of Virtualization in cloud and discuss its types and usage with different cloud models and services	K3
CO4	To analyze the performance of cloud computing with cloud security issues in recent technologies and platforms	K4
CO5	To summarize the importance of cloud computing models, services, usage of virtualization with cloud security issues	K5, K6

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	1	2	3	3	1	2	2
CO2	2	2	3	2	2	2	3	2	2	2
CO3	3	3	3	2	3	3	3	1	3	3
CO4	3	2	3	2	3	3	3	2	3	3
CO5	3	3	3	2	3	3	3	2	3	3

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

SYLLABUS

UNIT	CONTENTS	HOURS	COs	COGNITIVE LEVEL
I	**Introduction to the Cloud Computing** Introduction to Cloud Computing: Basic Concepts and Terminology, Goals and Benefits, Risks and Challenges. Virtualization Technology: Hardware Independence, Server Consolidation, Resource Replication, Operating System-based Virtualization, Hardware- Based Virtualization, Virtualization Management.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
II	**Fundamental concepts and models:** Roles and boundaries, Cloud Characteristics, Cloud Delivery models, Cloud Deployment models. Cloud service models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS) and Software as a Service (SaaS). **Fundamental Cloud Security**: Basics, Threat agents, Cloud security threats. Industrial Platforms and New Developments: Amazon Web Services, Google App Engine, Microsoft Azure	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
III	**Fundamental Cloud Architectures:** Introduction to basic cloud architecture and its importance. Workload distribution, resource pooling, dynamic scalability and elastic resource capacity. Service load balancing, cloud bursting and storage provisioning. Redundant storage for data availability and reliability.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5. K6
IV	**Advanced Cloud Architectures:** Virtual machine clustering and load balancing of virtual servers. Service relocation and zero downtime concepts. Cloud resource balancing and reservation. Failure detection and recovery mechanisms. Bare-metal provisioning, rapid provisioning and storage workload management.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
V	**Cloud Delivery Model Considerations:** Cloud Delivery Models: The Cloud Provider Perspective, Cloud Delivery Models: The Cloud Consumer Perspective, Cost Metrics and Pricing Models: Business Cost Metrics, Cloud Usage Cost Metrics, Cost Management Considerations.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

VI	**Self-Study for Enrichment** **(Not included for End Semester Examinations)** **Service Quality Metrics and SLAs:** Service Quality Metrics, SLA Guidelines	–	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6

TEXT BOOKS

1. Ricardo Puttini, Thomas Erl, and Zaigham Mahmood **"Cloud Computing - Concepts, Technology and Architecture"** 2013
2. A. Srinivasan, **"Cloud Computing: A Practical Approach for Learning and Implementation"** 1st Edition by, 2014

REFERENCE BOOKS

1. Mastering Cloud Computing: Foundations and Applications Programming by Christian Vecchiola, Rajkumar Buyya, and S.Thamarai Selvi, 2013
2. Distributed and Cloud Computing: From Parallel Processing to the Internet of Things by Geoffrey C Fox, Jack Dongarra, and Kai Hwang, 2012

WEB REFERENCES

1. https://www.coursera.org/learn/cloud-computing
2. https://www.geeksforgeeks.org/cloud-computing/cloud-computing-tutorial/

PEDAGOGY

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

COURSE DESIGNER

Dr.M.Ellakkiya, Associate Professor, Department of Information Technology

Semester I	Internal Mark: 30		External Mark: 70	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1DCE1C	**C. Distributed Technologies**	**Discipline Centric Elective Course-I**	**5**	**3**

Course Objectives

- Introduce the technologies behind the distributed computing environment.
- Provide the programming expertise to develop applications for a distributed environment.
- Build concepts regarding the fundamental principles of distributed systems.

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9,12

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome	Cognitive Level
CO1	Understand principles of distributed systems.	K1
CO2	Explain communication and middleware	K2, K3
CO3	Apply coordination and consistency techniques	K4
CO4	Analyze services, security, and fault tolerance	K5
CO5	Design and evaluate distributed applications	K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	1	1	1	1	3	2	1	2	1
CO2	3	2	2	1	2	3	3	1	2	2
CO3	3	2	3	2	2	3	3	2	2	2
CO4	3	2	3	2	2	3	3	2	2	2
CO5	3	3	3	2	3	3	3	2	3	3

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

Syllabus

UNIT	CONTENT	HOURS	Cos	COGNITIVE LEVEL
I	Challenges involved in establishing remote connection – Strategies involved in remote computation – Current distributed computing practices through Dot Net and Java technologies.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5 K6
II	**Advanced ADO.NET:**Disconnected Data Access – GridView, DetailsView, FormView controls – Crystal Reports – Role of ADO.NET in Distributed Applications.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5 K6
III	**Advance ASP.NET:** AdRotator, MultiView, Wizard and Image Map Controls – Master Pages – Site Navigation – Web Parts – Uses of these controls and features in Website development.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5, K6
IV	**Advanced features of ASP.NET** Security in ASP.NET – State Management in ASP.NET – Mobile Application development in ASP.NET – Critical usage of these features in Website development.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5 K6
V	**Web Services:** Role of Web Services in Distributed Computing – WSDL, UDDI, SOAP concepts involved in Web Services – Connected a Web Service to a Data Base – Accessing a Web Service through an	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5,

	ASP.NET application.			K6
VI	**Self Study for Enrichment** (Not included for End Semester Examinations) Contemporary developments related to the course during the semester concerned.		CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5 K6

Textbooks

1. K. Meena, R. Sivakumar, A. B. Karthick Anand Babu, *Dot Net Technologies*, Himalaya Publishing House Pvt. Ltd., Bangalore, 2016, (ISBN: 978-93-5037-938-9).
2. Andrew S. Tanenbaum, Maarten van Steen, Pearson, 4th Edition, 2023
3. Matthew MacDonald, Apress, Updated Edition, 2019

References

1. *Andrew Lock*, Manning Publications, 2nd Edition, 2023
2. *Adam Freeman*, Apress, 8th Edition, 2024

Web References

1. https://www.geeksforgeeks.org/types-of-distributed-system/
2. https://www.dotnetcurry.com/tutorials/aspnet
3. https://www.javatpoint.com/ado-net-tutorial

Pedagogy

Chalk and Talk, PPT, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

1. Dr. M.Ellakkiya, Associate Professor, Department of Information Technology.

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1GEP1A	**Web Programming (P)**	**Generic Elective Course - I**	**4**	**2**

Course Objectives

To develop dynamic and responsive web applications using modern frameworks and tools

S.No	Course Features	Relevance Status
1.	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability & Skill Development
2.	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Industry Relevance (Global)
3.	Course relevant to Local/Regional/National/Global needs	Professional Ethics & Cyber Security
4.	Course focus on Sustainable Development Goals	SDG 4, 8 & 9

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Recall the syntax and structure of HTML, CSS, JSON, jQuery, AJAX, React, and Node.js	K1, K2
CO2	Identify the working principles of client-side and server-side web technologies	K2
CO3	Apply web development techniques to build responsive and interactive web pages	K3
CO4	Analyze frontend and backend integration using React and Node.js	K4
CO5	Develop and evaluate a full-stack web application based on user requirements	K5, K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	2	3	3	2	2	2	2	3	3	1
CO2	3	2	3	2	2	3	3	2	3	2
CO3	3	3	3	2	1	3	3	2	3	3
CO4	3	2	3	2	3	2	3	3	3	2
CO5	3	3	3	3	3	3	3	3	3	3

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

Lab Listing

1. Create a basic webpage using HTML5 semantic elements and formatting tags.
2. Design a student registration form using HTML forms and validation controls.
3. Develop a responsive webpage layout using CSS, Flexbox, and Media Queries.
4. Create and manipulate JSON objects and arrays using JavaScript.
5. Implement DOM manipulation using jQuery selectors and methods.
6. Develop animations and event handling using jQuery effects.
7. Fetch and display data from a JSON file using Fetch API.
8. Implement AJAX-based form submission without page reload.
9. Create a React application with functional components and JSX.
10. Develop a Counter Application using React Hooks (useState).
11. Create a basic HTTP server using Node.js and handle requests.
12. Develop a simple REST API using Express.js for CRUD operations.

WEB REFERENCES

1. **https://www.w3schools.com/xml/ajax_intro.asp**
2. **https://www.w3schools.com/react/**
3. **https://nodejs.org/en/docs/**

PEDAGOGY

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

COURSE DESIGNER

Ms. V. Infine Sinduja, Associate Professor, Department of Information Technology

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1GEP1B	**Cloud Computing (P)**	**Generic Elective Course - I**	**4**	**2**

Course Objectives

- To understand the basics of virtualization, web services, and cloud platforms using tools such as VMware, Hyper-V, Azure, and Google App Engine.
- To develop and deploy virtual machines, web services, and cloud-based applications with database connectivity.
- To apply hands-on skills in implementing Storage as a Service, Platform as a Service, and other cloud concepts through practical experiments**.**

S. No.	Course Features On the successful completion of the course, students will be able to	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Understand and apply basic virtualization concepts using VMware and Hyper-V.	K1
CO2	Configure virtual networks for communication between virtual machines.	K2, K3
CO3	Develop and deploy basic web services with database connectivity.	K3, K4
CO4	Demonstrate the use of cloud service models such as SaaS and PaaS.	K5
CO5	Build and deploy simple applications on cloud platforms like Azure and Google App Engine.	K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	1	3	3	2	2	3	2	3	3	3
CO2	3	2	3	2	2	3	3	2	3	3
CO3	3	3	3	2	2	3	3	2	2	3
CO4	3	2	3	2	3	3	3	3	3	2
CO5	3	3	2	3	2	3	3	2	2	3

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

LAB EXERCISE

1. Creating VMs using VMWare workstation.
2. Connecting VMs in a network.
3. Implement virtualization using VMWare ESXi Server and managing with vCenter.
4. Implement Windows Hyper V virtualization.
5. Show the implementation of web services.
6. Implementing Web Service that connects to MySQL database.
7. Study and Implementation of Storage as a Service.
8. Study and Implementation of Platform as a Service.

Web References

1. **VMware Virtualization Documentation**
   https://www.vmware.com/support/pubs/
2. **Microsoft Hyper-V and Azure Documentation**
   https://learn.microsoft.com/
3. **Google Cloud & App Engine Documentation**
   https://cloud.google.com/docs

Pedagogy

Chalk and Talk, Power Point Presentation, Discussion, Assignment, Demo, Quiz and Seminar.

Course Designer

Dr.M. Ellakkiya Associate Professor, Department of Information Technology

Semester I	Internal Mark: 40		External Mark: 60	
COURSE CODE	**COURSE TITLE**	**CATEGORY**	**Hrs/Week**	**CREDITS**
26PIT1NMEP1	**AI TOOLS FOR HUMAN RESOURCE MANAGEMENT – I (P)**	**Non-Major Elective Course -I**	**3**	**2**

COURSE OBJECTIVES

- Introduce the fundamentals of Artificial Intelligence and its applications in core Human Resource Management functions.
- Develop practical skills in using AI tools for recruitment, resume screening, interviewing, and HR communication.
- Enable students to analyze employee data using AI-assisted HR analytics for informed decision-making.

S. No.	Course Features	Relevance Status
1	Course emphasis on Employability/Entrepreneurship/Skill Development	Employability / Skill Development
2	Course integrates cross cutting issues relevant to Professional Ethics/Gender Sensitization / Environment and Sustainability / Human Values/Indian Knowledge System	Professional Ethics
3	Course relevant to Local/Regional/National/Global needs	Global needs
4	Course focus on Sustainable Development Goals	SDG 4, 8, 9

Course Outcomes and Cognitive Level Mapping

CO Number	Course Outcome On the successful completion of the course, students will be able to	Cognitive Level
CO1	Understand the role and scope of Artificial Intelligence in modern Human Resource Management practices.	K1
CO2	Apply AI tools for HR functions such as recruitment, resume screening, and job description generation.	K2
CO3	Design and implement AI-based chatbots and automated systems for HR communication and interview processes.	K3
CO4	Analyze employee data using AI-assisted techniques for performance evaluation and workforce insights.	K4
CO5	Evaluate ethical, legal, and bias-related issues in the application of AI tools in HR decision-making.	K5, K6

Mapping of CO with PO and PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	2	2	2	2	3	1	2	2	1
CO2	3	3	2	3	3	2	3	2	3	2
CO3	3	2	3	3	3	3	3	3	2	3
CO4	3	3	3	2	3	2	3	3	3	3
CO5	3	3	3	3	3	3	3	2	3	3

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

LAB EXERCISES

1. **Introduction to AI in Human Resource Management:** Overview of AI in HRM, Understanding HR datasets, Ethical issues and bias in AI.(ChatGPT, Google Gemini, Microsoft Copilot)

2. **AI-Based Recruitment and Resume Screening:** Job description generation, Resume parsing and keyword matching, Candidate shortlisting and ranking. (ChatGPT (JD creation, screening prompts), Zoho Recruit (AI – Zia) – demo, Resume Parser tools, Microsoft Excel / Google Sheets)

3. **AI in Interviewing and HR Chatbots:** Interview question generation, AI-assisted interview simulation, HR chatbot design for employee queries. (ChatGPT, Dialogflow (Google), Botpress (basic))

4. **HR Analytics and Employee Data Analysis:** Employee performance analysis, Attrition trend identification, HR KPI dashboards. (Microsoft Excel (AI features), Power BI, Orange Data Mining (no-code AI))
5. **AI in Employee Engagement and Learning:** Sentiment analysis of employee feedback, Personalized learning recommendations, AI-supported appraisal insights. (ChatGPT, MonkeyLearn (sentiment analysis), SurveyMonkey (AI features))

Course Designer

Dr.P.Sudha,Associate Professor