

M.SC. INFORMATION TECHNOLOGY

SEM	COURSE CODE	COURSE	COURSE TITLE	INS. HRS	CREDIT	MARKS		TOTAL
						CIA	ESE	
I	20PIT1CC1	Core- I	ASP.NET	6	5	25	75	100
	20PIT1CC2	Core – II	Data Structures and Algorithms	6	5	25	75	100
	20PIT1CC3	Core– III	Database Systems	6	4	25	75	100
	20PIT1CC4P1	Core– IV A	ASP.NET Lab - Practical	3	2	10	40	50
	20PIT1CC4P2	Core– IV B	RDBMS Lab - Practical	3	2	10	40	50
	20PIT1DE1A/B	DSE – I #		6	4	25	75	100
	TOTAL				30	22		
II	20PIT2CC5	Core– V	Java Programming	6	5	25	75	100
	20PIT2CC6	Core– VI	Mobile Communication	6	5	25	75	100
	20PIT2CC7	Core– VII	Data Science and R Programming	6	4	25	75	100
	20PIT2CC8P1	Core– VIII A	Java Programming Lab - Practical	3	2	10	40	50
	20PIT2CC8P2	Core– VIII B	R Programming Lab - Practical	3	2	10	40	50
	20PIT2DE2A/B	DSE – II#		6	4	25	75	100
	TOTAL				30	22		
III	20PIT3CC9	Core– IX	Software Testing	6	5	25	75	100
	20PIT3CC10	Core– X	Web Services	6	5	25	75	100
	20PIT3CC11	Core– XI	Internet of Things	6	4	25	75	100
	20PIT3CC12P1	Core– XII A	Software Testing Lab - Practical	3	2	10	40	50
	20PIT3CC12P2	Core– XII B	Web Services Lab- Practical	3	2	10	40	50
	20PIT3DE3A/B	DSE – III#		6	4	25	75	100
	20PIT3EC1	Extra Credit Course-I	Online Course (MOOC)	-	1*	-	-	-
	TOTAL				30	22		
IV	20PIT4CC13	Core– XIII	Open Source Technology	6	5	25	75	100
	20PIT4CC14P1	Core– XIVA	Open Source Technology Lab - Practical	3	3	10	40	50
	20PIT4CC14P2	Core– XIVB	Angular JS Lab - Practical	3	2	10	40	50
	20PIT4PW	Project	Project work	18	13	-	300	300
	20PIT4EC2	Extra Credit Course -II	Information Technology for Career Examinations	-	5*	-	100*	100*
	20PCNOC	Online Course (Compulsory)		1	-	-	-	
TOTAL				30	24			500
GRAND TOTAL				120	90			2000

*Not considered for grand total and CGPA

DISCIPLINE SPECIFIC ELECTIVES

SEMESTER	COURSE CODE	COURSE TITLE
I	20PIT1DE1A	Artificial Intelligence and Machine Learning
	20PIT1DE1B	Data Communication Networks
II	20PIT2DE2A	Semantic Web
	20PIT2DE2B	Cryptography and Network Security
III	20PIT3DE3A	Soft Computing
	20PIT3DE3B	Cloud Computing

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1CC1	Core – I	ASP.NET	6	5	100	25	75

Course Outcomes (COs):

1. Acquire working knowledge of web applications development
2. Able to display dynamic data from data sources
3. Knowledge on security in web services.
4. Develop Secured web applications
5. Selection of appropriate programming language for the real world problems.

UNIT I: ASP.NET Introduction

18 hours

The .NET Framework: .NET Programming Framework – VB.NET, C# and the .NET Languages- CLR – Class Library – ASP.NET. **Learning the .NET Languages:** The .NET Languages – Data Types – Declaring Variables – Scope and Accessibility – Variable Operations – Object-Based Manipulations – Conditional Structures – **# Loop Structures – Functions and Subroutines #.**

UNIT II: Developing ASP.NET Applications

18 hours

Web From Fundamentals: A simple Page Applet – Improving the Currency Changes – A Deeper Look at HTML Control Classes – The Page Class. **Web Controls:** Stepping Up to Web Controls – Web Control Classes – AutoPostBack and Web Control Events – A simple Web Page Applet – Accessing Web Controls.

UNIT III: Forms

18 hours

Validation and Rich Controls: The Calendar Control – Formatting the calendar – The AdRotator – The Advertisements File – The AdRotator Class – Validation – A simple Validation Example – Regular Expressions. **State Management:** Viewstate – Transferring Information – Custom Cookies – Session State – Session State Configuration – **# Application State #.**

UNIT IV: Working With Data

18 hours

Overview of ADO.NET: Introducing ADO.NET and Data Management – Characteristics of ADO.NET – ADO.NET Object Model. **ADO.NET Data Access:** The SQL Select, Update, Insert and Delete statement – Creating a Connection – Defining a Select Command – Command With DataReader- Updating Data – Accessing, Modifying, Updating Disconnected Data. **The DataList, DataGrid, and Repeater:** Comparing the Template Controls – Selecting, Editing, Paging and Sorting with the DataGrid.

UNIT V

18 hours

Web Services Architecture: Internet Programming Then and Now – WSDL – SOAP – Communicating with a Web service – Web Service Discovery and UDDI. **Creating Web Services:** Web Service Basics – The StockQuote, Documenting, Testing your Web Service – Web Service Data Types. **Using Web Services:** Consuming a Web Service – **# Using the Proxy Class #.**

..... # Self-study portion

Text Book:

ASP.Net: The Complete Reference, Matthew MacDonald, McGraw Hill Edition (India) Edition 2002.

UNIT I : Part 1: Section 1, 2

UNIT II : Part 2: Section 6, 7

UNIT III : Part 2: Section 9, 10

UNIT IV : Part 3: Section 12, 13, 15

UNIT V : Part 4: Section 18, 19, 20

Books for References:

1. Professional ASP.NET 1.1 Bill Evjen , Devin Rader , Farhan Muhammad , Scott Hanselman, SrivakumarWrox.
2. ASP. NET Black Book DreamTech.

Web Reference:<https://www.w3schools.com/asp/default.ASP><https://www.tutorialspoint.com/asp.net/index.htm>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20PIT1CC1	ASP.NET					6	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓		✓		✓		✓	
CO2		✓	✓	✓	✓		✓	✓	✓	✓	
CO3	✓		✓	✓	✓	✓		✓	✓	✓	
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	
CO5		✓		✓	✓		✓			✓	
Number of matches (✓) = 37, Relationship: High											

Prepared by:

1. B. Benazir Butto

Checked by:

1. Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1CC2	Core – II	DATA STRUCTURES AND ALGORITHMS	6	5	100	25	75

Course Outcomes (COs):

- CO 1. Selecting appropriate data structures for any specified problem
- CO 2. To implement the various operations (Traverse, Search, Insert, Delete)
- CO 3. To learn mathematical background for analysing algorithm
- CO 4. To apply the proper algorithm design method for problem solving.
- CO 5. Evaluating the algorithms and data structures used in the problem to determine the time and memory consumption.

UNIT I

18 hours

Lists, Stacks and Queues: Abstract Data Types (ADTs) - The Stack ADT - The Queue ADT

UNIT II

18 hours

Trees: Introduction - Binary Trees - Representing Binary Trees in Memory - Traversing Binary Trees - Traversal Algorithms using Stacks - Header Nodes: Threads. Binary Search Trees - Searching and Inserting in Binary Search Trees - Deleting in a Binary Search Tree - AVL Search Trees - Insertion in an AVL Search Tree - Deletion in an Search Tree - m-way Search Trees - Searching Insertion and Deletion in an m-way Search Tree - B Trees - Searching Insertion and Deletion in B Trees - Heap: Heapsort. **# Path Lengths: Huffman's Algorithm - General Trees #.**

UNIT III

18 hours

DIVIDE AND CONQUER: The General Method – Defective Chessboard – Binary Search – Finding the Maximum and Minimum – Merge Sort – Quick Sort – Selection - **# Strassen's Matrix Multiplication #.**

UNIT IV

18 hours

THE GREEDY METHOD: General Method - Container Loading - Knapsack Problem - Tree Vertex Splitting – Job Sequencing With Deadlines - Minimum Cost Spanning Trees - **# Optimal Storage On Tapes – Optimal Merge Patterns #** - Single Source Shortest Paths

UNIT V

18 hours

DYNAMIC PROGRAMMING: The General Method – Multistage Graphs – All-Pairs Shortest Paths – Single-Source Shortest Paths - Optimal Binary Search Trees - String Editing - 0/1 Knapsack - Reliability Design - The Traveling Salesperson Problem - **# Flow Shop Scheduling #.** BACKTRACKING: The General Method – The 8-Queens Problem – Sum of Subsets – Graph Coloring – Hamiltonian Cycles – Knapsack Problem

..... # Self-study portion

Text Book:

1. Mark Allen Weiss, "Data Structures an Algorithm Analysis in C", Pearson publishing Company Limited, Second Edition, Reprint, Eleventh Impression 2009

UNIT I : Chapter 3

2. Seymour Lipschutz, Data Structures (Schaum's Outlines), Tata McGraw-Hill Publishing Company Limited, Fourth Reprint, 2006

UNIT II : Chapter 7

3. Ellis Horowitz, SatrajSahni and SanguthevarRajasekaran, Fundamentals of Computer Algorithms, Universities Press, Second Edition, Reprint 2009

UNIT III : Chapter 3 (3.1 – 3.8)

UNIT IV : Chapter 4

UNIT V : Chapter 5 and 7

Books for References:

Introduction to Algorithms 3rd Edition Sep 2010 Charles E. Leiserson. Ronald L. Rivest. Clifford Stein.

Web Reference:<https://www.tutorialride.com/data-structures/trees-in-data-structure.htm><https://www.javatpoint.com/daa-algorithm-design-techniques>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20PIT1CC2	DATA STRUCTURES AND ALGORITHMS					6	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓	✓	✓	✓		
CO2	✓	✓		✓		✓	✓	✓		✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 45, Relationship: Very High											

Prepared by:

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Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1CC3	Core – III	DATABASE SYSTEMS	6	4	100	25	75

Course Outcomes (COs):

1. Demonstrate an understanding of the elementary & advanced features of DBMS & RDBMS
2. Attain a good practical understanding of the SQL
3. Develop clear concepts about Relational Model.
4. Examine techniques pertaining to Database design practices
5. Execute various advance SQL queries related to Transaction Processing & Locking using concept of Concurrency control.

UNIT I

18 hours

Introduction: Database System Applications – Purpose of Database Systems – Views of Data – Database Languages – Data Storage and Querying – Database Architecture – Database Users and Administrator – Structure of Relational Database – Keys – **# Schema Diagrams #**– Formal Relational Query Languages: Relational Algebra

UNIT II

18 hours

Introduction to SQL: Over View of SQL – SQL 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 Expression – Views. Entity-Relationship Model – Constraints – Removing Redundant Attributes in Entity Sets – **# Entity- Relationship Diagram #**.

UNIT III

18 hours

Normalization: Purpose of Normalization – How Normalization Support Database Design – Data Redundancy and Update Anomalies – Functional Dependencies – First Normal Form – Second Normal Form – Third Normal Form. Advanced Normalization: More on Functional Dependencies – BCNF – 4NF – 5NF.

UNIT IV

18 hours

Storage and File Structure: RAID - File Organization – Organization of Records in Files – Data Dictionary storage. Indexing and Hashing: Basic Concepts – Ordered Indices – B⁺-Tree Index Files – Static Hashing – **# Dynamic Hashing #**.

UNIT V

18 hours

Transaction: Transaction Concept – A simple Transaction Model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability – Concurrency Control: Lock-Based Protocol – Timestamp-Based Protocol – Validation-Based Protocol – **# Recovery Systems: Failure Classification – Recovery and Atomicity #**.

..... # Self-study portion

Text Book:

1. Abraham Silberschatz, Hendry F. Korth and S. Sudarshan, Database System Concepts, 6th Edition, Mcgraw- Hill International Edition

UNIT I: Chapter (1.1-1.5, 1.9, 1.12, 2.1, 2.3, 2.4, 6.1)

UNIT II: Chapter (3.1 – 3.9, 4.1, 4.2, 7.2, 7.3, 7.5)

UNIT IV: Chapter (10.3, 10.5-10.7, 11.1-11.3, 11.6, 11.7)

UNIT V: Chapter (14.1 – 14.6, 15.1, 15.4, 15.5, 16.1, 16.3)

2. Database Systems A Practical Approach to Design, Implementation, and Management, 4th Edition by Thomas M.Connolly, Carolyn E.Begg, Pearson Education, Fifth Impression, 2012.

UNIT III: Chapter 13(13.1-13.4, 13.6-13.9) Chapter 14(14.1.14.2, 14.4, 14.5)

Books for References:

1. Fundamentals of Database Systems, 5th Edition by RamezElmasri, Shamkant B. Navathe, Pearson Education Ltd.
2. C.J Date, A. Kannan and S.Swaminathan, An Introduction to Database Systems, 8th Edition, PearsonEducation Asia.

Web Reference:

<https://www.db-book.com/db6/slide-dir/>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20PIT1CC3	DATABASE SYSTEMS					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓			✓	✓	✓		✓	✓		
CO2	✓			✓	✓	✓		✓	✓		
CO3	✓	✓		✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 41, Relationship: High											

Prepared by:

1. S. Syed Ibrahim

Checked by:

1. Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1CC4P1	Core – IV A	ASP.NET LAB - Practical	3	2	50	10	40

1. **Simple Programs:**

- a) Develop a Program to demonstrate String Object.
- b) Display first N Fibonacci numbers.
- c) Write a program to find the eligibility of admission for a professional course based on the following criteria:

Marks in Maths ≥ 65 , Marks in Phy ≥ 55 , Marks in Chem ≥ 50 , Total in all three subject ≥ 180 , total in Math and Subjects ≥ 140

Test Data :

Input the marks obtained in Physics :65

Input the marks obtained in Chemistry :51

Input the marks obtained in Mathematics :72

2. **Web Forms Programs:**

- a) Making use of Currency Changes.
 - b) Write a program to create a table dynamically.
 - c) Develop a program to generate the Greeting Card Automatically.
3. Making use of AdRotator control.
 4. Create a Bio- data Using Validation Controls.
 5. Write a program to implement state management techniques.
 6. Write a program to implement view state and session state.
 7. Create a program to manipulate student details using DML Commands through connected approach.
 8. Write a program to access the data in DataList and DataGrid.
 9. Develop a project to update and delete few records using Disconnected Access.
 10. Design an ASP.NET to perform basic mathematical operations using web services.
 11. Design an ASP.Net client for web service.

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1. B. Benazir Butto

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1CC4P2	Core – IV B	RDBMS LAB - Practical	3	2	50	10	40

I. Data Definition Languages

1. Create the following relations

Customer (customer-Id (Primary key), customer-name, address)

Account (account-number (Primary key), branch-name, balance)

Loan (loan-number (Primary key), branch-name, amount)

Branch (branch-name, branch-city, assets)

Depositor (customer-name, account-number)

Borrower (customer-name, loan-number)

Supplier (supplier-number, part-number, color, quantity) use candidate key

2. Write DDL query to perform foreign key with on delete cascade - A foreign key with cascade delete means that if a record in the parent table is deleted, then the corresponding records in the child table will automatically be deleted.

3. Write DDL query to change the column and table name.

4. Alter with three options

Add – add columns in the existing table

Modify – modify the data type and size in the existing table

Drop – delete column from existing table

II. Data Manipulation Languages

(1) Insert Operation

(2) Rename Operation

Display the customer-name instead of customer-id

(3) Tuple Variables

Using branch relation, Find the names of all branches that have assets greater than at least one branch located in a city (any city)

(4) String Operations

Find the customer names whose names start with M.

Find the customer names whose names end with R.

Find the customer name whose names contain “ mo” as a substring

Find the customer name whose names exactly six character.

Find the customer name whose names at least five character.

(5) Ordering of Tuples

To list in alphabetic order all customers who have loan at a branch (ex: cantonment)

To list customer names in descending order.

(6) Set Operation – (union, Intersect, minus)

Find all customers having a loan, an account or both at the bank.

Find all customers who have both a loan and account at the bank.

Find all customers who have an account but no loan at the bank.

Find all customers who have a loan but not an account at the bank.

(7) Aggregate functions – (average, minimum, maximum, total, and count)

Find average account balance at a branch. (any branch name like cantonment branch)

Find the minimum balance at a branch.

Find the maximum balance at a branch.

Find the total balance at a branch

Find the number of accounts in a branch.

(8) Aggregate functions with group by and having clause)

Find the average account balance at each branch.

Find branch names those branches where the total balance is more than Rs. 1, 00,000.

Find the branches those branches where the total accounts are more than 3.

(9) Nested sub-queries. Membership (in and notin)

Find all customers who have both a loan and account at the bank.

Find all customers who have an account but no loan at the bank.

Set Comparison (some, all)

Using branch relation, Find the names of all branches that have asset value greater than at least one branch located in a city (any city)

Find the names of all branches that have asset value greater than that of each branch located in a city (any city)

(10) Views

Create the view consisting of customer-names and branch-names who have either loan or an account at the branch.

(11) Deletion

Delete the tuples of all accounts with balances below the average at the bank (sub-query).

Delete all accounts tuples at every branch located in a city(any city)

(12) Updates

All balances are to be increased by 5 percent.

Update with case statements

All accounts with balances over 10000 receives 10 percent interest where as others receive 5 percent

(13) Join Operations

Inner join – Find the customer-names who have loan from a branch (KK nagar)

Left outer join – Show the relation, which loan not buy a single customer.

Right outer join – Show the relation, which customers bought loan, that loan details

not in the loan relation

III. PL/SQL Procedure

1. Reverse the string.
2. Student Mark Sheet Preparation
3. Pay Roll preparation
4. Find factorial number using recursive function.
5. Find Fibonacci series using recursive function.

IV. SQL FORMS

1. Student Mark System
2. Pay Roll Preparation
3. Income Tax Calculation

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Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1DE1A	DSE - I	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	6	4	100	25	75

Course Outcomes (COs):

1. Recognize appropriate search algorithms for any Artificial Intelligence problems
2. Represent a problem using formal and non-formal knowledge representation
3. Develop a machine learning system for association rule learning algorithm
4. Implement and apply reinforcement and statistical learning algorithms for solving a real-world problem
5. Apply the machine learning technique for solving a real-world problem

UNIT I

18 hours

INTRODUCTION- Definitions of Artificial Intelligence- Topics of Artificial Intelligence – Production Systems- State Space Representation- Branches of Artificial Intelligence – Applications of Artificial Intelligence-HEURISTIC SEARCHTECHNIQUES:Generate –and-test – Hill climbing-Search Techniques –Problem Reduction- Constraint Satisfaction – Means-ends Analysis – # **GAME PLAYING: MINIMAX Procedure- Alpha-Beta Pruning- Combined Approach#.**

UNIT II

18hours

KNOWLEDGE REPRESENTATION: Knowledge Management- Types of Knowledge- Knowledge Representation – Approaches to Knowledge Representation- Issues in Knowledge Representation- Knowledge base- KNOWLWDGE REPRESENTATION STRUCTURES: First Order Logic – Frames-Conceptual Dependency- Scripts-Semantic Network- REASONING: # **Types of Reasoning#** -Non-monotonic Inference Methods-Non-monotonic Reasoning-Truth Maintenance System – Reasoning with Fuzzy Logic- Rule-based Reasoning- Diagnosis Reasoning

UNIT III

18 hours

LEARNING: Types of Learning- Machine Learning – Intelligent Agents-ASSOCIATION LEARNING: Basis of Association- APRIORI Algorithm – Éclat Algorithm –FP Growth Algorithm – TERTIUS Algorithm-SCADA Application by FP Growth Algorithm-CLUSTERING- # **Means Clustering- Fuzzy Clustering #**-Hierarchical Clustering-Cluster Similarity

UNIT IV

18 hours

REINFORMENT LEARNING: Markov Decision Problem-Q-learning- Temporal Difference Learning – Learning Automata-STATISTCAL LEARNING: Hidden Markov Models- Linear Classifiers-Quadratic Classifiers- Decision Trees – Bayesian Networks

UNIT V

18 hours

ARTIFICIAL NEURAL NETS: ANN Basics-ANN-Learning Process –Perceptron- RBF Networks- ANN summary- SUPERVISED LEARNING: Support Vector Machines-Inductive Logic Programming- Case-based reasoning-Ensemble Classifiers-Nearest Neighbourhood- Fuzzy Network- UNSUPERVISED LEARNING: Expectation Maximization-Self Organizing Maps- Adaptive Resonance Theory

..... # Self-study portion

Text Book:

Vinod Chandra S.S and AnandHareendran S, Artificial Intelligence and Machine learning, PHI Learning Private Limited, 2014

UNIT I : Chapter I, Chapter II, and Chapter III

UNIT II : Chapter IV, Chapter V and Chapter VI

UNIT III : Chapter VII, Chapter VIII and Chapter IX

UNIT IV : Chapter X and Chapter XI

UNIT V : Chapter XII, Chapter XII and Chapter XIII

Books for References:

1. Elaine Rich, Kevin Knight and Shivasankar B Nair, Artificial Intelligence, Third Edition, Tata McGraw Hill Education Private Limited, 2010
2. John Mueller and Luca Massaron , Machine Learning For Dummies, John Wiley & Son, 2016

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20PIT1DE1A	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓	✓					
CO2	✓	✓		✓	✓	✓					
CO3	✓	✓	✓	✓	✓		✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓		✓	✓	✓	✓	
Number of matches (✓) = 37, Relationship: High											

Prepared by:

1. Dr. G. Ravi

Checked by:

1. Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
I	20PIT1DE1B	DSE - I	DATA COMMUNICATION NETWORKS	6	4	100	25	75

Course Outcomes (COs):

1. Basic understanding of Computer networks, OSI Reference Model, TCP Reference Model and Routing algorithms.
2. Explain CSMA/CD, internetworking technologies, Routing and Addressing.
3. Develop current research problems and research methods in advance computer networks.
4. Apply security principles and investigate network security threat to system design.
5. Apply research in network security.

UNIT I

18 hours

INTRODUCTION: Data Communications – Networks. Network Models: The OSI Model – Layers in the OSI Model – TCP/IP Protocol suite – Physical Layer: # **Multiplexing** # – Transmission Media: Guided Media- Telephone Network.

UNIT II

18 hours

Data Link Layer: Error Detection and Correction: Introduction – Block coding – Cyclic Codes – Checksum. Data Link Control: Framing – # **Flow and Error Control** # – Protocols – Noiseless Channels – Noisy Channel – HDLC-PPP.

UNIT III

18 hours

Network Layer Design Issues – Routing Algorithms: The Optimality Principle – Shortest Path Algorithm – Flooding – Distance Vector Routing – Link State Routing – Hierarchical Routing – Broadcasting Routing – Congestion Control Algorithms – Network Layer in the Internet: IP Addresses- The IP Version 6 Protocol.

UNIT IV

18 hours

Transport Layer: Process to Process Delivery – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP)- Stream Control Transport Protocol (SCTP).

UNIT V

18 hours

Application Layer: Name Space – Domain Name Space (DNS) – Distribution of Name Space – DNS in the Internet – Remote Logging – E-Mail – File Transfer-Network Management System (NMS) –# **Simple Network Management Protocol (SNMP)** #.

..... # Self-study portion

Text Book:

1. Behrouz A Forouzan, Data Communications and Networking, Fourth Edition, Tata McGraw-Hill, Special Indian Edition
2006

UNIT I : Chapter 1.1, 1.2, 2.2 – 2.4, 6.1, 7.1, 9.1

UNIT II : Chapter 10.1, 10.2, 10.4, 10.5, 11.1 – 11.7

UNIT IV: Chapter 23.1 – 23.4, 25.1 – 25.4, 26.1 – 26.3 2

UNIT V : Chapter 25.1 – 25.4, 26.1 – 26.3, 28.1, 28.2

2. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks, Fifth Edition, Pearson Education, Inc., Publishing as Prentice Hall, 2011

UNIT III : Chapter 5.1.1 – 5.1.5, 5.2.1 – 5.2.7, 5.3.1 – 5.3.5, 5.6.2 – 5.6.3

Books for References:

William Stallings, Data and Computer Communication, PHI, Eighth Edition, 2009

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
I	20PIT1DE1B	DATA COMMUNICATION NETWORKS					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓			✓	✓	✓		✓	✓		
CO2	✓			✓				✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 40, Relationship: High											

Prepared by:

1. S. Syed Ibrahim

Checked by:

1. Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2CC5	Core – V	JAVA PROGRAMMING	6	5	100	25	75

Course Outcomes (COs):

1. Knowledge of the structure and model of the Java programming language, (knowledge)
2. Use the Java programming language for various programming technologies (understanding)
3. Develop software in the Java programming language, (application)
4. Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)
5. Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis)

UNIT I

18 hours

Introducing Classes: Class Fundamentals – Declaring Objects – Introducing Methods – Constructors – The this keyword – Garbage Collection – Overloading Methods – Call by value, Call by reference – Recursion – Understanding static – final. Inheritance: Inheritance Basics – Using super – Method overriding – **#Dynamic Method Dispatch #** – Using Abstract Classes

UNIT II

18 hours

Packages and Interfaces: Declaring Packages – Access Protection – Importing Packages – Defining, Implementing, Applying Interfaces - Exception Handling: Exception Types – try, catch – throw – throws – finally – Creating User-defined Exceptions. Multithreaded Programming: The Java Thread Model – Creating a Thread – Thread Priorities - String Handling.

UNIT III

18 hours

The Collection Interfaces and Utility Classes: ArrayList, LinkedList, Vector, Stack, and Date classes. Files and IO Streams: File – The Byte Streams: DataInputStream – DataOutputStream-FileInputStream – FileOutputStream – SequenceInputStream – PrintStream. **# The Character Streams: FileReader – FileWriter #**– Serialization.

UNIT IV

18 hours

Networking: Introduction-Networks Domain Names and Protocols - Ports-Transmission Control Protocol-UDP Approach. Java Database Connectivity: Establishing a connection – **# Creation of data tables – Entering data into table – Table Updating #** – Use of PreparedStatement – Obtaining metadata.

UNIT V

18hours

Event Handling: Event Model – Event Classes – Event Listeners and Interfaces. Swing Component classes: Icons and JLabels - JText Fields – JButtons -JCheckBoxes – JRadioButtons - JComboBoxes.

..... # Self-study portion

Text Book:

1. Herbert Schildt, The Complete Reference Java 2, Fifth Edition, TMH Education Pvt. Ltd.

UNIT I : Chapter 6, 7, 8

UNIT II : Chapter 9, 10, 11

UNIT III : Chapter 15, 17

UNIT V : Chapter 20, 26

2. C. Muthu, Programming with Java, Vijay Nicole imprints Private Limited, 2004.

UNIT IV: Chapter 15, 18

Books for References:

1. Herbert Schildt with Joe O' Neil, Java –Programmer's Reference, TMH.

Web Reference:

<https://www.programiz.com/java-programming>

<https://www.javatpoint.com/java-tutorial>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20PIT2CC5	JAVA PROGRAMMING					6	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓		✓	✓			✓	✓	
CO2	✓		✓	✓	✓	✓		✓	✓		
CO3		✓	✓	✓	✓	✓	✓	✓			
CO4		✓		✓	✓		✓	✓	✓	✓	
CO5		✓		✓	✓		✓			✓	
Number of matches (✓) = 33, Relationship: Moderate											

Prepared by:

1. M. Kamal

Checked by:

1. Dr. S. VaaheethaKfatheen

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2CC6	Core – VI	MOBILE COMMUNICATION	6	5	100	25	75

Course Outcomes (COs):

1. Able to recognise about mobile communications and distinguish various medium access protocols.
2. Justify the current requirements for satellite systems.
3. Apply knowledge of wireless LAN systems and utilization of 802.11 systems.
4. Impart the knowledge of mobile networks.
5. Interpolate with TCP over 3G networks and inferred with spectrum technology.

UNIT I

18 hours

Mobile Computing – Dialog Control – Networks – Middleware and Gateways – Application and Services – Developing Mobile Computing Applications – Standard Bodies – Players in Wireless Space. Mobile Computing Architecture: Architecture for Mobile Computing – **# Three Tier Architecture #**– Design Considerations for Mobile Computing

UNIT II

18 hours

Mobile Computing Through Telephony: Evolution of Telephony - Multiple Access Procedure –Mobile Computing Through Telephone - Voice XML - TAPI – Emerging Technologies: Bluetooth – RFID –**# Mobile IP – IPV6 #**.

UNIT III

18 hours

GSM: Global System for Mobile Communications – GSM Architecture – GSM Entities – Call Routing in GSM – Network Aspects in GSM. SMS: Mobile Computing Over SMS – SMS – Value Added Services through SMS.

UNIT IV

18 hours

GPRS: GPRS and Packet Data Network – GPRS Network Architecture – Data Services in GPRS – Billing and Charging in GPRS. WAP: Evolution of Wireless Data and WAP – **# GPRS Applications #**.

UNIT V

18 hours

CDMA and 3G: Introduction – Spread Spectrum Technology – Direct Sequence Spread Spectrum (DSSS) – IS-95: IS 95 Architecture – IS 95 Authentication and Security – IS 95 Handoff and Roaming. CDMA versus GSM. Wireless LAN: Introduction – Wireless Advantages – Wireless LAN Architecture: Types of Wireless LAN – Mobility in Wireless LAN – **# Wireless LAN Security #**.

Self-study portion

Text Book:

Mobile Computing – Asoke K Talukder, RoopaRYavagal, Tata MC Graw Hill Publishing

UNIT I : Chapter 1 &2 (1.3 to 1.8,1.11 to 1.12, 2.4 to 2.6)

UNIT II : Chapter 3& 4 (3.1 to 3.2,3.4,3.6,3.7,4.2 to4.3,4.5 to 4.6)

UNIT III : Chapter 5&6 (5.1 to 5.4,5.7,6.1 to 6.3)

UNIT IV : Chapter 7 (7.2, 7.3, 7.5, 7.8) Chapter 8 (8.1.1, 8.4)

UNIT V : Chapter 9 (9.1, 9.2.1, 9.3.2, 9.3.5, 9.3.6, 9.4) Chapter 10 (10.1, 10.2, 10.4.1, 10.5, 10.8)

Books for References:

T.G. Palanivelu, R.Nakkeeran, Wireless and Mobile Communication, PHI Learning Private Limited, New Delhi, 2009

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20PIT2CC6	MOBILE COMMUNICATION					6	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓			✓		✓					
CO2	✓	✓		✓	✓	✓	✓	✓	✓		
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO4	✓			✓		✓					
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 33, Relationship: Moderate											

Prepared by:

1. B. Diana

Checked by:

1. Dr. S. Vaaheetha Kfatheen

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2CC7	Core – VII	DATA SCIENCE AND R PROGRAMMING	6	4	100	25	75

Course Outcomes (COs):

1. Understand Data Science Process, Statistical Inference, New kinds of Data, Exploratory Data Analysis.
2. Gain basic notions of Model building, Evaluation Metrics formulas, Concepts of Data Engineering and Next-Gen Data Scientists.
3. Fetch insights behind R Programming for Data Science
4. Understand basic statistics and execute Data visualization method via R packages.
5. Implement and apply Data Analysis Techniques (Regression, Clustering, and Classification) via R Packages to build a Machine Learning model.

UNIT I: Introduction to Data Science

18 hours

Introduction: Big Data and Data Science Hype – Getting past the hype –Datafication – The Current Landscape (Little History): Data Science Jobs - Data Science Profile – What is a Data Scientist, Really – In Academia – In Industry – Statistical Thinking in the age of Big Data – Statistical Inference – New kinds of data - Exploratory Data Analysis (EDA): Basic tools of EDA - Philosophy of exploratory data analysis – Data Science Process: Data Scientist’s Role in this process – Connection to scientific method. Data Science and Risk – About Square – The Risk Challenge (Risk Engine) – Trouble with Performance Estimation: Define error metric – Defining the labels –# **Challenges in features and learning #.**

UNIT II: Model Building, Evaluation & Data Engineering

18 hours

Model Building Tips (Good Guidelines): Code readability and reusability – Productionizing Machine Learning models – Data Leakage: Market predictions – How to avoid leakage - Evaluating models: Accuracy – Probabilities matter, Not 0’s and 1’s. – Data Engineering: MapReduce – Enter MapReduce – Other examples of MapReduce – What can’t MapReduce Do? – Pregel – Hadoop: Brief Introduction to Hadoop – Cloudera – How to get started with Hadoop Next-Generation Data Scientists: Data Science Again –Next-Gen Data Scientists: Being a Problem Solvers – Cultivating Soft Skills –# **Being Question Askers – Being an Ethical Data Scientist #.**

UNIT III:

18 hours

Introduction to R: Using R – Working with R – Packages – Batch Processing – Using output as input – Working with large datasets – Working through an example – Creating a dataset: Understanding datasets – Data structures in R: Vectors - Matrices – Arrays – Data frames – Factors – Lists – Data Input: Entering data from keyboard – Importing data from delimited text – Importing data from Excel –# **Importing data from XML #.**

UNIT IV: Basic Statistics and Visualizations in R

18hours

Discriptive Statistics: Via *summary()* – *apply()* – *describe()* – *stat.desc()* – by group using *aggregate()* – *by group using by()*.

Data Visualization (Plotting): Packages – Scatter plots - Bar Charts & Plots - R Graphics:#**Packages - The ggplot2 package – Maps #.**

UNIT V: Data Analysis via R Packages

18 hours

Regression Analysis: Packages – Simple Regression – Clustering: Packages – k-means clustering – Machine Learning in Action (Classification): Packages – Train methods (Decision Tree – Neural Networks –# **Random Forests #).**

..... # Self-study portion

Text Book:

1. RachellSchutt& Cathy O’Neil, “Doing Data Science – Straight Talk from the Frontline”, O’Reilly Media Inc., 2014, ISBN: 978-1-449-35865-5.

UNIT I : Chapter 1, 2 & 9

UNIT II : Chapter 9, 13, 14

2. Robert I Kabacoff, “R in Action - Data Analysis and Graphics with R”, Manning Publications Co., 2011, ISBN: 9781935182399.

UNIT III : Chapter 1 & 2**UNIT IV: Chapter 7 & 8**

3. Dan Toomy, "R for Data Science – Learn and Explore the Fundamentals of Data Science with R", Packt Publishing Ltd., 2014, ISBN: 978-1-78439-086-0.

UNIT IV : Chapter 7 & 8**UNIT V : Chapter 4, 1, 6 & 10****Books for References:**

1. Roger D. Peng, "R Programming for Data Science", Leanpub, 2014.
2. Hadley Wickham, Garrett Golemund, " R for Data Science – Import-Tidy-Transform-Visualize and Model Data", O'Reilly Media Inc., 2017, ISBN: 978-1-491-91039-9
3. Richard Cotton, "Learning R – A Step by step Function Guide to Data Analysis", O'Reilly Media Inc.,2013, ISBN: 978-1-449-35710-8.
4. Garrett Golemund, "Hands-on Programming With R – Write your own functions and Simulations", O'Reilly Media Inc., 2014, ISBN: 978-1-449-35901-0.
5. Joel Grus, "Data Science from Scratch – First Principles with Python", O'Reilly Media Inc.,, 2015, 978-1-491-90142-7.
6. NimaZumel, John Mount, "Practical Data Science with R", Manning Publications, 2014. ISBN 9781617291562.
7. Avrim Blum, John Hopcraft, RavindranKannan, "Foundations of Data Science", January 2018.
8. W.N. Vennables, D.M. Smith and R Core Team, "An Introduction to R", Manual for R, version 3.6.1, 2019.

Web Reference:

www.r-project.org
 www.cran.r-project.org
 https://www.rstudio.com

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20PIT2CC7	DATA SCIENCE AND R PROGRAMMING					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓			✓	✓	✓		✓			
CO2	✓			✓	✓	✓		✓			
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 40, Relationship: High											

Prepared by:

1. Dr. M. Sabibullah
2. Dr. S. VaaheethaKfatheen

Checked by:

1. Dr. K. Nafees Ahmed

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2CC8P1	Core – VIII A	JAVA PROGRAMMING LAB - Practical	3	2	50	10	40

Develop a program in Java

1. To create class and object to prepare student report using NetBeans.
2. To implement inheritance to find area & perimeter of a rectangle using NetBeans.
3. To create abstract class Department with abstract method calcBonus(double salary) and normal method dispTotSalary(string dept). Define classes Accounts and Sales which extends Department and contains
calcBonus() with its own implementation.
4. To implement multilevel inheritance by applying various access controls to its data members and methods.
5. To create two threads. First thread displays a message for every one second, the second thread displays a message for every two seconds.
6. To create thread using Runnable interface to compute and display factorials of first five natural numbers.
7. To arrange the given names in alphabetical order and to display the all the names in reverse order.
8. To demonstrate various Vector operations using NetBeans.
9. To print the contents of ArrayList in reverse order using NetBeans.
10. To display the file properties of a given file or directory using NetBeans.
11. To merge the two files using SequenceInputStream using NetBeans.
13. To find the local machine and Host IP address using NetBeans.
14. To send a text from one system to another using TCP/IP Sockets using NetBeans.
15. To prepare invoice using swing controls and to store the details in database using JDBC.
16. To make use of Swing controls to create three buttons Red, Green and Blue. Using ActionEvent class set background by applying color on button click.

Prepared by:

1. M. Kamal

Checked by:

1. Dr. S. Vaaheetha Kfatheen

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2CC8P2	Core – VIII B	R PROGRAMMING LAB - Practical	3	2	50	10	40

1. Installing R and R Studio
2. Applying Simple Commands in R
3. R as a Calculator application
4. Execution of Loops and Functions via R - Control Structures
5. Basic Descriptive Statistics using *summary()* – *sapply()* – *describe()* – *stat.desc()* – by group using *aggregate()* in R
6. Reading and writing different types of Datasets in R
7. Visualizations: Visualize various Plotting and Graphics in R
8. Regression: Perform Simple Regression using R Package
9. Clustering: Apply k-means by using R Package
10. Classification: Use Random Forest / Naïve Bayes / NN by using R Package

Text Book

Dan Toomy, “R for Data Science – Learn and Explore the Fundamentals of Data Science with R”, Packt Publishing Ltd., 2014, ISBN 978-1-78439-086-0.

Prepared by:

1. Dr. M. Sabibullah
2. Dr. S. VaaheethaKfatheen

Checked by:

1. Dr. K. Nafees Ahmed

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2DE2A	DSE - II	SEMANTIC WEB	6	4	100	25	75

Course Outcomes (COs):

1. Understanding the syntactic web
2. Understanding the notions for description logic and precisely define reasoning techniques.
3. Web ontology language helps in understanding classes and properties.
4. Semantic web service brings the full potential of the web.
5. Ontology libraries that is relevant to indexing of resources in the semantic web.

UNIT I

18 hours

Future of internet: Introduction – The syntactic web- The semantic web- Working of semantic web -What the semantic web is not. Ontology in computer science: Defining the term ontology-Classifying the Ontologies-Web Ontology Description Languages-# **Ontologies, categories and intelligence** #.

UNIT II

18 hours

Knowledge representation in description logic: Introduction – Informal Examples Inference problems. RDF and RDF schema: introduction – # **XML essentials** #- RDF- RDF schema

UNIT III

18 hours

OWL: Introduction – Requirement for web ontology description languages-Header information, versioning , annotation properties-Properties – # **Classes- Individuals – Data types** #- A summary of OWL vocabulary. Rule languages: introduction – Usage scenarios for rule languages- ruleML- SWRL-TRIPLE.

UNIT IV

18 hours

Semantic web services: Introduction –Web service essentials- OWL-S service ontology- An OWL-S example-scenario description – Informal process definition – OWL-S process definition. Methods for ontology development: Introduction – ushold and king ontology development method- Methontology.

UNIT V

18 hours

Ontology sources: introduction- Meta data Definition –Dublin core – Warwick framework-Upper ontologies: SUMO-KR Ontology-word net. Semantic web software tools: Introduction- Metadata and ontology editors.

..... # Self-study portion

Text Book:

Karin K. Breitman, Macro Antonio Casanova,WalterTruszkowski, Semantic Web, Springer International Edition.

UNIT I : Chapter 1.1-1.5, 2.1, 2.3-2.5

UNIT II : Chapter 3.1, 3.2-3.4, 4.1-4.4

UNIT III : Chapter 5.1-5.8, 6.1-6.2, 6.4-6.6

UNIT IV : Chapter 7.1-7.4 (7.4.1-7.4.2), 8.1, 8.2, 8.4

UNIT V : Chapter 9.1-9.2 (9.2.1-9.2.3), 9.3.1-9.3.2, 9.3.4, 10.1-10.2

Books for References:

Semantic Web Services Processes And Application (Sie) by Cardoso J, Springer Exclusive (Cbs), 2004

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20PIT2DE2A	SEMANTIC WEB					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓			✓	✓	✓					
CO2	✓			✓	✓	✓					
CO3	✓			✓	✓	✓					
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 32, Relationship: Moderate											

Prepared by:
1. MoziburRaheman Khan

Checked by:
1. Dr. S. Vaaheetha Kfatheen

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
II	20PIT2DE2B	DSE - II	CRYPTOGRAPHY AND NETWORK SECURITY	6	4	100	25	75

Course Outcomes (COs):

1. Understand cryptography and network security concepts and applications
2. Apply security policy in system design
3. Analyse network security protocols
4. Identify a network security threat
5. Design the code to implement the cryptographic algorithm

UNIT I

18 hours

Overview: Computer Security Concepts- The OSI Security Architecture -Security Attacks -Security Services - Security Mechanisms - A Model for Network Security - Classical Encryption Techniques: Symmetric Cipher Model - # **Substitution Techniques #** -Transposition Techniques - Steganography

UNIT II

18hours

Block Ciphers and the Data Encryption Standard: Block Cipher Principles - The Data Encryption Standard - A DES Example - The Strength of DES - Differential and Linear Cryptanalysis - Block Cipher Design Principles - Advanced Encryption Standard - AES Structure - AES Transformation Functions - AES Key Expansion -An AES Example

UNIT III

18hours

Block Cipher Operation: Multiple Encryption and Triple DES - Electronic Code Book - Cipher Block Chaining Mode. Public-key Cryptography and RSA: Principles of Public-key Cryptosystems - # **The RSA Algorithm #**. Other Public-Key Cryptosystems: Diffie-Hellman Key Exchange.

UNIT IV

18hours

Cryptographic Hash Functions: Applications of Cryptographic Hash Functions - Two Simple Hash Functions - Requirements and Security - Hash Functions Based on Cipher Block chaining - Secure-Hash Algorithm (SHA) - SHA-3. Message Authentication Codes: Message Authentication Requirements - # **Message Authentication Functions #** - Requirements for Message Authentication Codes

UNIT V

18hours

Digital Signatures: Digital Signatures. Key Management and Distribution: Symmetric Key Distribution using Symmetric Encryption - Symmetric Key Distribution using Asymmetric Encryption - Distribution of Public keys - X.509 Certificates - Public-Key Infrastructure - User Authentication: Kereberos.

..... # Self-study portion

Text Book:

William Stallings, "Cryptography and Network Security Principles and Practice", Fifth Edition, Pearson Education Inc, First Impression 2011.

UNIT I : Chapter 1: 1.1 - 1.6 & Chapter 2: 2.1 – 2.3, 2.5

UNIT II : Chapter 3: 3.1 - 3.6 & Chapter 5: 5.2 - 5.5

UNIT III : Chapter 6: 6.1 - 6.3, Chapter 9: 9.1 - 9.2 & Chapter 10: 10.1

UNIT IV : Chapter 11: 11.1 - 11.6 & Chapter 12: 12.1 - 12.3

UNIT V : Chapter 13: 13.1, Chapter 14: 14.1 to 14.5 & Chapter 15: 15.3

Books for References:

1. William Stallings, "Network Security Essentials Applications and Standards", Third Edition, Pearson Education Inc, Fifth Impression 2011
2. Behrouz A. Ferouzan, "Cryptography and Network Security", Tata McGraw Hill, 2007

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
II	20PIT2DE2B	CRYPTOGRAPHY AND NETWORK SECURITY					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓		✓	✓		✓		✓	✓	
CO2	✓		✓		✓	✓	✓	✓			
CO3	✓	✓	✓	✓	✓	✓		✓	✓	✓	
CO4		✓	✓	✓	✓		✓		✓	✓	
CO5				✓	✓			✓		✓	
Number of matches (✓) = 33, Relationship: Moderate											

Prepared by:

1. M. Kamal
2. Dr. M. Sabibullah

Checked by:

1. Dr. S. VaaheethaKfatheen

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very poor	Poor	Moderate	High	Very high

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3CC9	CORE– IX	SOFTWARE TESTING	6	5	100	25	75

Course Outcome (COs):

On completion of the course, students will be able to

1. Study the fundamental concepts in software testing
2. Discuss various software testing issues and solutions in software unit test, integration and performance testing
3. Expose the advanced software testing topics, such as Internationalization testing
4. Understand the concepts of automation
5. Implement the various test concepts

UNIT I

18 hours

Software Development Life Cycle Models: Phases of Software Project – Quality, Quality Assurance and Quality control – Testing, Verification & Validation – Process Model – Life Cycle Models - White Box Testing: What is White Box Testing? – Static Testing – #Structural Testing# – Challenges - Black Box Testing: What is Black Box Testing? – Why Black Box Testing? – When to do Black Box Testing? – How to do Black Box Testing?

UNIT II

18 hours

Integration Testing: What is Integration Testing? – Integration testing as a Type of Testing – Integration Testing as a Phase of Testing – Scenario testing – Defect Bash - System and Acceptance Testing: Overview – Why System Testing? – Functional Vs Non Functional Testing – Functional System Testing – #Non Functional Testing# – Acceptance Testing – Summary of Testing Phases

UNIT III

18 hours

Performance Testing: Factors governing Performance Testing – Methodology for Performance Testing – Tools for Performance Testing – Process for Performance Testing - Regression Testing: – What is Regression Testing – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – #Best Practices in Regression Testing#.

UNIT IV

18 hours

Internationalization Testing: Primer – Test Phases – Enabling Testing – Locale Testing – Validation – Language Testing – Localization Testing – Tools – Challenges and Issues – Ad hoc Testing: - Overview – Buddy Testing – Pair Testing – Exploratory Testing – Iterative Testing – Agile and Extreme Testing – Defect Seeding – Usability and Accessibility Testing: - What is Usability Testing? – Approach – When to do Usability Testing? – How to Achieve Usability? – Quality Factors – Aesthetics Testing – #Accessibility Testing# – Tools – Lab Setup – Test Roles

UNIT V

18 hours

Test Planning, Management, Execution and Reporting: Test Planning -Test Management – Test Process – Test Reporting – Best Practices - Software Test Automation: What is Test Automation – Terms used in Automation – Skills Needed for Automation – What to Automate, Scope of Automation – Design & Architecture for Automation – Generic Requirement for Test Tool Framework – Process model for Automation – Selecting a Test tool – Automation for Extreme Programming Model – #Challenges in Automation#.

#.....# Self-study portion

Text Book:

Srinivasan Desikan, Gopaldaswamy Ramesh, Software Testing – Principle & Practices, Pearson Education, New Delhi, 2006.

UNIT I : Chapter 2: 2.1 – 2.5, Chapter 3: 3.1 – 3.4 & Chapter 4: 4.1 – 4.4

UNIT II : Chapter 5: 5.1 – 5.5, Chapter 6: 6.1 – 6.7

UNIT III : Chapter 7: 7.2 – 7.5 & Chapter 8: 8.1 – 8.5

UNIT IV : Chapter 9: 9.2 – 9.6, 9.8 – 9.11, Chapter 10: 10.1 – 10.7 & Chapter 12: 12.1 – 12.10

UNIT V : Chapter 15: 15.2 – 15.6, Chapter 16: 16.1 – 16.10

Books for References:

1. Ron Patton, “*Software Testing*”, 2nd Edition, Pearson Education, New Delhi, 2006.
2. William E. Perry, “*Effective Methods for Software Testing*”, 3rd Ed., Wiley India, 2006.
3. Renu Rajani, Pradeep Oak, “*Software Testing – Effective Methods, Tools and Techniques*”, TMH Publishing Company Limited, New Delhi, 2004.

Web references

https://www.tutorialspoint.com/software_testing

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
III	20PIT3CC9	SOFTWARE TESTING					6	5			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓	✓	✓	✓		✓	✓	✓	✓	✓	
CO2	✓	✓			✓	✓	✓		✓		
CO3	✓	✓	✓	✓		✓	✓	✓	✓		
CO4	✓	✓		✓	✓	✓	✓	✓	✓	✓	
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Number of matches (✓) = 42, Relationship: High											

Prepared by:

Mr.S. Peer Basha

Checked by:

Mr. M. Kamal

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3CC10	CORE– X	WEB SERVICES	6	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

1. Understand the difference between a web service and web application
2. Explain the basic flow of data and the responsibilities for web service consumption
3. Describe the formats for requests to and responses from a web service that uses a SOAP interface
4. Describe the formats for requests to and responses from a web service that uses a WSDL
5. Identify and describe the responsibilities for the design patterns that are appropriate for the design of a subsystem consuming a web service

UNIT I

18 hours

Evolution and Emergence of web services: What is distributed computing? – Importance of distributed computing – Client-Server applications – CORBA – Java RMI – DCOM – Message oriented middleware – The Role of J2EE and XML in distributed computing – Emergence of web services – Introduction to web services: What are web services? – Motivation and Characteristics – Why use web services? – Basic Operational model of web services – CORE Web services standards – #Key Benefits of web services#

UNIT II

18 hours

Web services architecture and technologies: Web services architecture and its CORE building blocks –Tools of the Trade: SOAP – WSDL – UDDI – Implementing web services – Developing web services enabled applications – Developing Web services using SOAP – XML based protocols and SOAP – Anatomy of a SOAP message – SOAP encoding – #Building SOAP web services#

UNIT III

18 hours

Description and discovery of web services – Web Services Description Language – 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 – Limitations of UDDI

UNIT IV

18 hours

Exploring Java Web services developer pack – Introduction to the Java Web Services Developer Pack – Java Web Services Developer Pack – Java XML Pack – Java APIs for XML – Java WSDP registry server – ANT Build tool – Downloading the web services pack – XML processing and data binding with Java APIs – XML Basics – Java API for XML Processing – JAXP – uses for JAXP – JAXP API model – #Java Architecture for XML Binding#

UNIT V

18 hours

Security in Web Services: Web Services Security – Challenges of securing web services – #XML encryption# – XML signatures – Security Assertions Markup Language – XML access control markup language

#.....# Self-study portion

Text Book:

Ramesh Nagappan, Robert Skoczylas, Rima Patel Sriganesh, “*Developing Java Web Services*”, Wiley Publication, 2006

UNIT I : Chapter 1, 2

UNIT II : Chapter 3, 4

UNIT III : Chapter 5

UNIT IV : Chapter 7, 8

UNIT V : Chapter 13

Books for Reference:

Sandeep Chatterjee, James Webber, *Developing Enterprise Web Services, An Architect’s Guide*, Pearson Education, Second Indian Reprint 2005.

Web Reference:

<https://www.webagesolutions.com/courses/WA2012-programming-java-soap-and-rest-web-services-jboss-eclipse>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific outcomes:

Semester	Code	Title of the Course					Hours	Credits				
III	20PIT3CC10	WEB SERVICES					6	5				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓	✓	✓	✓		✓	✓	✓	✓	✓		
CO2	✓	✓			✓	✓	✓		✓			
CO3	✓	✓	✓	✓		✓	✓	✓	✓			
CO4	✓	✓		✓	✓	✓	✓	✓	✓	✓		
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
Number of matches (✓) = 42, Relationship: High												

Prepared by:

Mr. M. Kamal

Checked by:

Mr. O. S. Abdul Qadir

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3CC11	CORE– XI	INTERNET OF THINGS	6	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

1. Recognize the underlying concepts of Internet of Things
2. Identify the various IoT enabling technologies and comprehend the idea of M2M
3. Apply the concept of IoT in real world scenarios
4. Describe the IoT design methodology and IoT devices
5. Implement IoT applications using Python packages

UNIT I

18 hours

Introduction: Definition and Characteristics of IoT - Things in IoT - IoT Protocols - IoT Functional Blocks - IoT Communication Models - IoT Communication APIs

UNIT II

18 hours

IoT Enabling Technologies: Wireless Sensor Networks - Cloud Computing- #Big Data Analytics# -Communication Protocols - Embedded System. IoT & M2M: Machine to Machine-Difference between IoT and M2M-SDN and NFV for IoT

UNIT III

16 hours

Domain Specific IoTs: Home Automation-Cities-Environment - Retail-Logistics- #Agriculture# -Industry-Health & Lifestyle.

UNIT IV

18 hours

Developing IoTs: IoT Design Methodology. IoT Physical Devices & Endpoints: What is an IoT Device-Exemplary Device: Raspberry Pi-Linux on Raspberry Pi-Other IoT Devices.

UNIT V

18 hours

Python Packages of Interest for IoT: JSON-XML - HTTPLib & URLLib - SMTPLib. Case Studies: Home Automation-#Productivity Applications#.

#.....# Self-study portion

Text Books:

1. Arshdeep Bahga and Vijay Madiseti, "*Internet of Things: A Hands-On Approach*", Universities Press (India) Private Limited, 1st Edition, 2015.
UNIT I : Chapter 1(1.1.1, 1.2.1, 1.2.2, 1.3.1, 1.3.2, 1.3.3)
UNIT II : Chapter 1(1.4) & Chapter 3(3.1,3.2,3.3,3.4)
UNIT III : Chapter 2(2.2, 2.3, 2.4, 2.6, 2.7, 2.8, 2.9 2.10)
UNIT IV : Chapter 5(5.1, 5.2) & Chapter 7(7.1, 7.2, 7.4, 7.7)
UNIT V : Chapter 6.11 & Chapter 9(9.2, 9.6)

Books for Reference:

1. Cuno Pfister, "*Getting started with the internet of things*", O'Rielly Publication, 2011

Web References:

1. <http://www.internet-of-things-book.com>
2. https://www.tutorialspoint.com/internet_of_things/index.htm
3. <https://data-flair.training/blogs/iot-tutorial>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
III	20PIT3CC11	INTERNET OF THINGS					6	4			
Course Outcomes COs	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓		✓			✓			✓	✓	
CO2	✓	✓	✓			✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓			✓	✓		✓	
CO4		✓	✓	✓				✓	✓		
CO5	✓				✓			✓	✓	✓	
Number of matches (✓) = 30, Relationship: Moderate											

Prepared by:

Dr. K. Nafees Ahamed

Checked by:

Mr. O. S. Abdul Qadir

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3CC12P1	Core– XII A	SOFTWARE TESTING LAB - Practical	3	2	50	10	40

1. Installation of Automation testing tools
2. Using Selenium IDE, Write a test suite containing minimum three test cases
3. Conduct a test suite for any two web sites
4. Install Selenium server and demonstrate it using a script in Java / PHP
5. Write and test a program to login a specific web page
6. Write and test a program to update 10 student records in a table into Excel file
7. Write and test a program to select the number of students who have scored more than 60 in any one subject (or all subjects)
8. Write and test a program to provide total number of objects present / available on the page
9. Write and test a program to get the number of list items in a list / combo box
10. Write and test a program to count the number of check boxes on the page checked and unchecked count

Prepared by:

Mr. S. Peerbasha

Checked by:

Mr. M. Kamal

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3CC12P2	Core– XII B	WEB SERVICES LAB - Practical	3	2	50	10	40

1. Develop a JAX-WS web service and client for displaying a welcome message
2. Develop a JAX-WS web service for currency conversion / temperature conversion
3. Develop a JAX-WS web service for factorial application
4. Develop a JAX-WS web service Fibonacci application
5. Develop a JAX-WS web service for printing the contents of ArrayList an order
6. Develop a JAX-WS web service for checking whether the input is palindrome or not
7. Develop a JAX-WS web service for designing a simple calculator
8. Develop a JAX-WS web service with database connectivity

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Checked by:

Mr. O. S. Abdul Qadir

Sem	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3DE3B	DSE – III	CLOUD COMPUTING	6	4	100	25	75

Course Outcomes (COs):

On completion of the course, student will be able to

1. Explain the core concepts of the cloud computing paradigm: how and why this paradigm shift came about, the characteristics, advantages and challenges brought about by the various models and services in cloud computing
2. Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost, and then study how to leverage and manage single and multiple datacenters to build and deploy cloud applications that are resilient, elastic and cost-efficient
3. Discuss system, network and storage virtualization and outline their role in enabling the cloud computing system model
4. Illustrate the fundamental concepts of cloud storage and demonstrate their use in storage systems such as Amazon S3 and HDFS
5. Analyze various cloud programming models and apply them to solve problems on the cloud

UNIT I

18 hours

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

18 hours

Introduction -Cloud Computing at a Glance - Historical Developments - Building Cloud Computing Environments

UNIT III

18 hours

Cloud Computing Architecture: Introduction - Cloud Reference Model Types of Clouds - # Economics of the Cloud # - Open Challenges

UNIT IV

18 hours

Infrastructure as a Service: Virtual Machines provisioning and Migration Services – Introduction and Inspiration Background and Related Work - Virtual Machine Provisioning and manageability – Virtual Machine Migration Services - PLATFORM AND SOFTWARE AS A SERVICE: Aneka – Integration of Private and Public clouds – Introduction Technologies and Tools for Cloud computing – Aneka cloud Platform – # Aneka Resource Provisioning Service #– Hybrid Cloud Implementation

UNIT V

18 hours

SLA Management in Cloud Computing: Inspiration - Traditional Approaches to SLO Management - Types of SLA – Life Cycle of SLA. Resource Cloud Mashups - Introduction - Concepts of a Cloud Mashup - Realizing Resource Mashups. GOVERNANCE AND CASE STUDIES: Data Security in the Cloud – # The current state of data security in the cloud # – Cloud Computing and Data Security Risk`

#.....# Self-study portion

Text Books:

1. RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, “*Mastering Cloud Computing*”, McGraw Hill Education (India) Private Limited Publications, First Reprint, 2013

UNIT I - Chapter 2.1 to 2.5

UNIT II- Chapter 1.1 to 1.3

UNIT III- Chapter 4.1 to 4.5

2. RajkumarBuyya, James Broberg and Andrzej Goscinski, “*Cloud Computing Principles and Paradigms*”, Wiley Publications, 2013

UNIT IV - Chapter 5.1 to 5.4 & Chapter 9.1 to 9.5

UNIT V- Chapter – 16.1 to 16.4, Chapter 21.1 to 21.3, Chapter 23.2, 23.4

Books for Reference:

Michael Miller, “*Cloud Computing Web Based Applications that change the way you work and collaborate online*”, Pearson Education, 2009.

Web Reference

<https://www.zdnet.com/article/what-is-cloud-computing-everything-you-need-to-know-about-the-cloud/>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits				
III	20PIT3DE3	CLOUD COMPUTING					6	4				
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)						
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5		
CO1	✓		✓	✓	✓	✓		✓	✓			
CO2	✓	✓	✓				✓	✓	✓	✓		
CO3	✓			✓	✓	✓			✓			
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
CO5		✓	✓	✓	✓	✓	✓	✓		✓		
Number of matches (✓) = 37, Relationship: High												

Prepared by:

Dr. Vaaheed Kfhadeen

Checked by:

Mr. M. Kamal

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Sem	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
III	20PIT3DE3A	DSE – III	SOFT COMPUTING	6	4	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

1. Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory
2. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
3. Understand the fundamental theory and concepts of neural networks, Identify different neural network architectures, algorithms, applications and their limitations
4. Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications
5. Reveal different applications of these models to solve engineering and other problems

UNIT I

18 hours

Introduction to Soft Computing – Introduction – Artificial Intelligence – Artificial Neural Networks – Fuzzy Systems – Genetic Algorithm and Evolutionary Programming

UNIT II

18 hours

Artificial Neural Networks - (First Generation) : Introduction to Neural Networks – Classification of ANNs – First-generation Neural Networks

UNIT III

18 hours

Fuzzy Logic- Introduction to Fuzzy logic – Classical sets and Fuzzy sets – Fuzzy set operations – Fuzzy relations – Fuzzy Composition

UNIT IV

18 hours

Fuzzy logic Applications – Introduction to Fuzzy logic Applications – Fuzzy controllers – MATLAB implementation of Fuzzy Logic Applications – Hybrid Techniques

UNIT V

18 hours

Genetic Algorithms and Evolutionary Programming – Introduction to Genetic Algorithms – Genetic Algorithms – Procedures of GAs – Working of GAs – Genetic Algorithms Applications

#.....# Self-study portion

Text Books:

N.P. Padhy and S.P.Simon, *Soft computing with MATLAB Programming*, Oxford University Press, 2015.

UNIT I : Chapter 1.1 to 1.5

UNIT II : Chapter 2.1, 2.4 & 2.5

UNIT III : Chapter 5.1, 5.5, 5.6, 5.7 & 5.8

UNIT IV : Chapter 6.1 to 6.4

UNIT V : Chapter 7.1 to 7.5

Books for Reference

1. S.N. Sivanandam and S.N. Deepa, *Principles of Soft Computing*, Wiley India Pvt. Ltd., 2017
2. I.S.R. Jang, C.T. Sun and E. Mizutani, *Neuro Fuzzy and Soft Computing*, PHI-Pearson Education, 2004

Web Reference:

<http://www.soft-computing.de/def.html>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
III	20PIT3DE3	SOFT COMPUTING					6	4			
Course Outcomes (COs)	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓		✓	✓	✓	✓		✓	✓		
CO2	✓	✓	✓				✓	✓	✓	✓	
CO3	✓			✓	✓	✓			✓		
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO5		✓	✓	✓	✓	✓	✓	✓		✓	
Number of matches (✓) = 37, Relationship: High											

Prepared by:

Dr. Vaaheedha Kfhadeen

Checked by:

Mr. M. Kamal

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20PIT4CC13	Core– XIII	OPEN SOURCE TECHNOLOGY	6	5	100	25	75

Course Outcomes (COs):

On completion of the course, students will be able to

1. Explore different open source technologies like PHP, MySQL and AngularJS with different packages
2. Gain confidence to create dynamic website on real world problems
3. Able to use the principles of database design in web pages using PHP & MySQL
4. Gain the knowledge of the basic principles of AngularJS
5. Understand the design of single-page applications and how AngularJS facilitates their development

UNIT I

18 hours

Essential PHP – Creating a first PHP page – More echo power – Using PHP “Here” documents – Working with variables – Creating constants – # Understanding PHP’s internal data types # Operators and Flow control – Working with the Assignment operators – The PHP String operators – Bitwise operator – PHP Comparison operators – PHP Logical operators – Ternary operators – Using if, else, else if statement – Switch statement – Using for, while, do...while, for each loops.

UNIT II

18 hours

Strings and Arrays – The String functions – Converting to and from strings – Formatting text strings – PHP array functions – Sorting Arrays – Handling Multi dimensional arrays –# Splitting and Merging arrays # – Creating functions in PHP. File Handling – Opening files using fopen – Reading text from a file using fgets – Closing a file – Checking if a file exists with file_exists – Writing to a file with fwrite

UNIT III

18 hours

MySQL : Connecting to and disconnecting from the server - MySQL data types - SHOW and CREATE databases - Creating a table- DESCRIBE,INSERT and SELECT command - #DROP tables and databases# Update , Alter and Delete Operations - MySQL access with PHP : Open a connection to the MySQL server - Disconnect a connection from MySQL server - Creating a database using PHP - Selecting MySQL database using PHP - Creating a table using PHP - Insert data into MySQL using PHP

UNIT IV

18 hours

Introducing AngularJS: Introduction: What is MVC? - Benefits - Philosophy - Starting out with AngularJS: A Basic AngularJS Application - AngularJS Hello World - Basic Angular JS Directives and Controllers: AngularJS Modules - Working with and Displaying arrays - Working with ng-repeat: ng-repeat Over an Object - Helper Variables in ng-repeat - # Track by ID # - ng-repeat Across Multiple HTML Elements.

UNIT V

18 hours

Forms, Inputs and Services: Working with ng-model – Working with Forms – # Leverage Data Binding and Models # - Form Validation and States – Error Handling with Forms – Other Forms Controls: Textareas – Checkboxes – Radio Buttons – Combo Boxes/Drop-Downs – Working with Filters: What are AngularJS Filters? – Creating AngularJS Filters. #.....# **Self-study portion**

Text Books:

1. Steven Holzner, *The Complete Reference PHP*, Tata McGraw Hill, New Delhi, 2007.

UNIT I: Chapters 1 & 2 **UNIT II:** Chapters 3 , 4 & 9

2. HajiramBeevi J, Khairunnisa and MunawaraBanu S,*Primer on PHP*, Yashini Publication, 1st Edition,2016

UNIT III: Chapter 8 (8.1-8.9), Chapter 9(9.1-9.6)

3. Shyam Seshadri and Brad Green, *AngularJS: Up and Running*, First Edition, Published by O’Reilly Media, Inc., 2014

UNIT IV : Chapter 1 & 2 **UNIT V :** Chapter 4 & 8

Books for Reference:

M.N. Rao , Fundamentals of Open Source Software, PHI Learning Private Ltd., Delhi, 2015

Web References:

<https://www.w3schools.com/angular/>

<https://www.tutorialspoint.com/angularjs/index.htm>

Relationship Matrix for Course Outcomes, Programme Outcomes and Programme Specific Outcomes:

Semester	Code	Title of the Course					Hours	Credits			
IV	20PIT4C13	OPEN SOURCE TECHNOLOGY					6	5			
Course Outcomes COs	Programme Outcomes (POs)					Programme Specific Outcomes (PSOs)					
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO1	✓		✓	✓		✓	✓	✓	✓	✓	
CO2	✓		✓		✓	✓	✓	✓	✓	✓	
CO3	✓	✓	✓	✓	✓	✓	✓	✓		✓	
CO4			✓	✓		✓		✓	✓	✓	
CO5	✓	✓	✓	✓		✓	✓	✓	✓	✓	
Number of matches (✓) = 40, Relationship: High											

Prepared by

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Checked by

Mr. M. Kamal

Note:

Mapping	1-29%	30-59%	60-69%	70-89%	90-100%
Matches	1-14	15-29	30-34	35-44	45-50
Relationship	Very Poor	Poor	Moderate	High	Very High

Semester	Code	Course	Title of the Course	Hour	Credits	Max. Marks	Internal Marks	External Marks
IV	20PIT4CC14P1	Core –XIVA	Open Source Technology Lab - Practical	3	3	50	10	40

1. Write a simple PHP program to :
 - a) Print Floyd triangle
 - b) Find the given year is a leap year or not.
 - c) Print Fibonacci series of a given number
 - d) Print sum of digits of a given number (with and without using while loop)
2. Develop a simple PHP program to :
 - a) Sort a given set of numbers
 - b) Retrieve all combinations of a given string using arrays
 - c) Demonstrate Six string functions
3. Develop a simple PHP program to draw a human face.
4. Develop a PHP program to create a simple calculator.
5. Develop a PHP program to demonstrate file handling.
6. Demonstrate DDL and DML commands using MySQL.
7. Develop a PHP Program to store an image in database.
8. Develop a simple CRUD operations using PHP and MySQL.
9. Design an authentication web page in PHP with MySQL.
10. Develop a PHP program to convert the PHP objects into JSON.

Prepared by

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Checked by

Mr. M. Kamal

Semester	Code	Course	Title of the Course	Hours	Credits	Max. Marks	Internal Marks	External Marks
IV	20PIT4CC14P2	Core– XIVB	ANGULAR JS LAB - Practical	3	2	50	10	40

Develop programs using AngularJS application:

1. Simple applications:
 - a) To display the values for different data types
 - b) To perform basic arithmetic operations
2. To demonstrate a shopping list using various built-in functions in Array
3. To change the date format using ng-model
4. To illustrate the use of Filter
5. Using Keyboard and Mouse events
6. For slide Toggle animation
7. To read JSON values and display it
8. Design a simple calculator
9. Design Login form and validate the username and password
10. To implement a basic search functionality application
11. Develop a simple text fade application
12. Develop a simple ToDo Application

Prepared by

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Checked by

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