



MOTHER TERESA WOMEN'S UNIVERSITY

KODAIKANAL – 624 102

M.Sc.(COMPUTER SCIENCE)
(EFFECTIVE FROM JUNE 2018-2019 ONWARDS)

OBJECTIVES

1. To produce employable Computer Professionals who have sound knowledge on Computer Science subjects that can be applied to develop and customize solutions
2. To develop academically competent and professionally motivated Computer personnel, equipped with Goal, critical thinking and ethical values that compassionately foster the scientific temper with a sense of social responsibility.
3. To develop skilled manpower in the various areas of Computer Science :
Software Development, Computer-Languages, Software engineering, Data base management, Web based applications etc.

SPECIFIC OUTCOMES FOR M.Sc. COMPUTER SCIENCE

- PSO1: Apply fundamental principles and methods of Computer Science to a wide range of Computer applications
- PSO2: Apply mathematical and scientific reasoning to a variety of computational problems.
- PSO3: Students have the opportunity to develop foundational skills to install and maintain computer networks, troubleshoot hardware and software problems.
- PSO4: Design and implement software systems that meet specified design and performance requirements
- PSO5: Apply advanced algorithmic and mathematical concepts to the design and analysis of software.
- PSO6: Adhere to do higher studies or progress as an entrepreneur.
- PSO7: Students gets the confidence to get succeed in IT industry.
- PSO8: Gets proficiency of computing, and to prepare themselves for the continued professional development.
- PSO9: Apply sound principles to the synthesis and analysis of computer systems

MASTER OF SCIENCE

M.SC CS

UNDER CBCS (with effect from 2018-2019)



MOTHER TERESA WOMEN'S UNIVERSITY

KODAIKANAL – 624 102

DEPARTMENT OF COMPUTER SCIENCE

M.SC. COMPUTER SCIENCE

ALLOCATION OF PAPERS AND CREDITS FOR PG PROGRAMME

2018 – 2019 ONWARDS

S.NO.	SUBJECT CODE	SUBJECT NAME	HOURS	CREDITS	INT	EXT	TOT
First Semester							
01.	PCST11	Advanced Java Programming	6	5	25	75	100
02.	PCST12	Data Structures and Algorithms	6	5	25	75	100
03.	PCST13	Mathematical Foundations of Computer Science	6	5	25	75	100
04.	PCSP11	Advanced Java Lab	6	5	25	75	100
05.	PCSE11	Elective – I	6	5	25	75	100
Total			30	25			500
Second Semester							
01.	PCST21	Advanced Operating System	6	5	25	75	100
02.	PCST22	Relational Database Management System	6	5	25	75	100
03.	PCST23	Computer Networks	6	5	25	75	100
04.	PCSP22	RDBM Lab	6	5	25	75	100
05.	PCSE22	Elective – II	6	5	25	75	100
Total			30	25			500
Third Semester							
01.	PCST31	Compiler Design	6	5	25	75	100
02.	PCST32	Software Engineering	6	5	25	75	100
03.	PCST33	Web Programming	6	5	25	75	100
04.	PCSP33	Web Programming Lab	6	5	25	75	100

05.	PCSE33	Elective – III	6	5	25	75	100
Total			30	25			500
Fourth Semester							
01.	PCST41	Digital Image Processing	6	5	25	75	100
02.	PCST42	Mobile Computing	6	5	25	75	100
03.	PCSP44	Project	-	5	25	75	100
Total			12	15			300
Grand Total				90			1800

ELECTIVES		
<u>SEMESTER I</u>	<u>SEMESTER II</u>	<u>SEMESTER III</u>
1. Computer Graphics 2. Soft Computing	1. Data Warehousing and Data Mining 2. Cryptography and Network Security	1. Software Project Management 2. Big Data Analytics

SCHEME OF EXAMINATION

Internal (Theory)	-	25
Test	-	15
Attendance	-	5
Assignment / Technical Quiz	-	5
Total	-	25
External (Theory)	-	75

QUESTION PATTERN

1.	PART A	10*1 Marks=10 (Objective Type/Multiple Choice) 2 Question from each Unit	10
2.	PART B	5*4 Marks =20 (From each Unit Either or Choice)	20
3.	PART C	3*15 Marks =45 (Open Choice) (Any three Question out of 5,onequestion from each unit)	45
		Total	75

The Internal assessment for Practical : 25

The External assessment for Practical : 75

SEMESTER - I

PCST11 – ADVANCED JAVA PROGRAMMING

Objectives:

OBJ1 :To Understand the Basic and advanced Programming Concepts of Java.

OBJ2 :To know how to import user defined package, to create thread program and string methods

OBJ3: To learn about the Input/output and Networking package classes and methods

COURSE OUTCOMES:

CO1 : Learn about the Abstract Windowing Toolkit and Applet package classes and methods

CO2 : Understand the Basic Concepts of Remote Method Invocation, JDBC and servlet.

Unit – I OVERVIEW OF JAVA, INHERITANCE AND METHODS

Introduction- Object-Oriented Programming- Lexical Issues- Data types- Variables and Arrays – Operators – Control Statements –Objects-Classes - Inheritance – Methods –Method Overriding – Using Final with Inheritance - The Creation of Java- Java Byte code - The Java Buzzwords – Garbage Collection

Unit – II USER DEFINED PACKAGES, THREAD PROGRAMMING AND STRING

Packages – Importing Packages – Interfaces – Exception Handling – Multithreaded Programming-The String Constructors –String Handling – Character Extraction – Comparison – Modifying a String - String Buffer.

Unit – III JAVA PACKAGES: I/O, NET PACKAGE

I/O Package: The Java I/O Classes and Interfaces – File – Byte Streams – The Character Streams – Serialization- Net Package: The Networking Classes and Interfaces – InetAddress – Datagrams – TCP/IP Server Sockets.

Unit – IV JAVA PACKAGES: AWT, APPLET

AWT Package: AWT Classes – Window Fundamentals – Working with Graphics– Working with Color – Working with Fonts – Applet Package: Applet Basics – Applet Architecture – Reading and Writing in Console – Print Writer class

Unit – V SOFTWARE DEVELOPMENT USING JAVA

Remote Method Invocation – JDBC – Servlets – Life Cycle of a Servlet – The Servlet API – Servlet and Http Package.

Text Book(s):

1. Herbert Schildt "The Complete Reference JAVA", 7th Edition-, Tata McGraw Hill, 2007.

Reference(s):

1. Herbert Schildt, "The Complete Reference", 8th Edition-, Tata McGraw Hill, 2011.
2. Kogent, "Java 6 Programming Black Book" Edition 2011, Kogent Learning Solutions.
3. Steven Holzner, "Java2(JDK 5 Edition) Programming" 2007 edition

SEMESTER - I

PCST12 – DATASTRUCTURES AND ALGORITHMS

Objectives:

OBJ1: To introduce algorithm analysis frame work for recursive and non recursive algorithms

OBJ2 :To acquire knowledge on ADTs such as List, Stack and Queue

OBJ3 :To explore the binary trees and the priority queues with their applications

COURSE OUTCOMES:

CO1 : Learn the various hashing techniques and Set ADT

CO2 :Exposure on graphs, its representation, traversal and applications

UNIT I INTRODUCTION TO ANALYSIS OF ALGORITHMS

Introduction to algorithms - Algorithm Analysis framework - Performance of algorithms: Space and Time Complexity - Asymptotic Notations: Big-Oh, Big-Omega and Big-Theta - Best, Worst and Average case analysis of algorithms. Mathematical analysis of Non recursive Algorithms - Sequential Search. Mathematical analysis of Recursive Algorithms - Recurrence relation - Binary search.

UNIT II LINEAR DATA STRUCTURES

Abstract Data Types (ADT) - List ADT - Array-based implementation - Linked list implementation - doubly-linked lists - Applications of Lists - Polynomial Operations. Stack ADT - Array based and linked List based implementation - Postfix expression evaluation. Queue ADT - Circular queue and linked List based implementation - Applications of Queues.

UNIT III BINARY TREES AND PRIORITY QUEUES

Trees - Binary trees - Binary tree representation and traversals - Threaded binary trees - Expression Trees -Binary Search Tree - Applications of trees. Balanced trees: AVL trees. Priority queue - Binary heap - Heap operations - Applications of heap.

UNIT IV SETS AND HASHING

Disjoint Set ADT - Dynamic equivalence problem - Set operations - Representation - Implementation of union - Find operations - Smart union algorithms - Path compression - Applications of set. Hashing - Closed hashing: Separate chaining - Open addressing: Linear and quadratic probing - rehashing - Extendible hashing.

UNIT V GRAPHS

Graph - Definitions - Representations - Topological sort - Breadth first traversal - Depth first traversal - Connected components - Shortest path algorithms: Single source shortest path - Minimum spanning tree - Prim's and Kruskal's algorithms.

Text Book(s):

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education, Fourth Edition, 2013.
2. AnanyLevitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2013.

Reference Book(s):

1. Ellis Horowitz and SartajSahni, "Fundamentals of Data Structures", Galgotia Book Sorce, Gurgaon, 2007.
2. Jean-Paul Tremblay and Paul G. Sorenson, "An Introduction to Data Structures with Applications", Tata McGraw-Hill, New Delhi, Second Edition, 1991.
3. Alfred V. Aho, John E. Hopcroft and Jeffry D. Ullman, "Data Structures and Algorithms", Pearson Education, New Delhi, 2006
4. Thomas H Cormen, Charles E Leiserson, Ronald L Rivest and Clifford Stein, "Introduction to Algorithms", Prentice Hall of India, New Delhi, Second Edition, 2007

SEMESTER - I

PCST13 – MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Objectives:

OBJ1 :To study the basic set theory.

OBJ2 :To familiarize different mathematical structures

OBJ3 :To study the basic concepts of Permutations and combinations

COURSE OUTCOMES:

CO1 :Study the different properties of graphs

CO2 :Study the basic search algorithms to find the shortest path

CO3: Study the homogeneous recurrence relations

UNIT – I MATHEMATICAL LOGIC & PREDICATES

Statements and notations, Connectives, Well-formed formulas, Truth Tables, tautology, equivalence implication, Normal forms. **Predicates:** Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT – II SET THEORY

Properties of binary Relations, equivalence, compatibility and partial ordering relations, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties, Pigeon hole principles and its application.

UNIT – III ALGEBRAIC STRUCTURES & COMBINATORICS

Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monoids, groups sub groups' homomorphism, Isomorphism. Elementary **Combinatorics:** Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion.

UNIT – VI RECURRENCE RELATIONS

Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, solving recurrence relation by substitution and Generating Functions. Characteristics roots solution of in homogeneous Recurrence Relation.

UNIT – V GRAPH THEORY AND APPLICATIONS

Representation of Graph, DFS, BFS, Spanning Trees, and planar Graphs. Applications of Graph: Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

Text Book(s):

1. Mathematical Foundation of computer science(Discrete Structures)- Dr.D.S.C, PRISM, 3/e, 2010.
2. Mathematical Foundation of computer science-Dr.J.Rajendra Prasad, T.Rama Rao, A.MadanaMohana Rao, 1/e, 2011.

3. Discrete mathematics structure with application to computer science, Tremblay. JP & Manohar P., Mc-Graw-Hill, 2/e, 2004.

Reference Book(s):

1. Discrete Mathematics, Norman Biggs, Oxford. 10/e, 2010.
2. Discrete Mathematics for Computer Scientists and Mathematicians. Joe L. Mott, Abraham Kandel, and Theodore P. Baker, Prentice Hall, 2/e, 2002.
3. Elements of Discrete Mathematics, C. L. Liu, McGraw-Hill, 3/e, 2008.
4. Discrete and Combinatorial Mathematics – An Applied Introduction – Ralph. P. Grimaldi, Pearson Education , 5/e ,2003.
5. Discrete mathematics and its applications, Kenneth H. Rosen, McGraw-Hill, 7/e, 2012.

SEMESTER - I
PCSP11 – ADVANCED JAVA LAB

COURSE OUTCOMES:

CO1 :Explore exception handling techniques.

CO2 :Practice concurrency programming

LIST OF EXPERIMENTS

1. Simple Java program with JavaDoc comments
2. Programs using packages and classes, JAR file creation
3. Programs using inheritance and its types
4. Programs using Interface and exception handling
5. Implementation of Multithreading
6. Program to demonstrate the use of Collection Classes
7. Database Connectivity using JDBC
8. Implementation of Applets
9. Event driven windows based application in Java
10. Program in AWT and Events Handling.
11. Network Programming using RMI.
12. Implementation using Java Servlet

SEMESTER - II

PCST21 – ADVANCED OPERATING SYSTEM

Objectives:

OBJ1 :To learn the concepts of operating systems.

OBJ2 :To learn about the various issues in operating systems.

COURSE OUTCOMES

CO1 : Familiarize with the important mechanisms in operating systems.

CO2 :Appreciate the emerging trends in operating systems

UNIT – IOPERATING SYSTEMS OVERVIEW

Introduction to operating systems – Computer system organization, architecture – Operating system structure, operations – Process, memory, storage management – Protection and security – Distributed systems – Computing Environments – Open-source operating systems – OS services – User operating-system interface – System calls – Types – System programs – OS structure – OS generation – System Boot – Process concept, scheduling – Operations on processes – Cooperating processes – Inter-process communication – Examples – Multithreading models – Thread Libraries – Threading issues – OS examples.

UNIT – IIPROCESS MANAGEMENT

Basic concepts – Scheduling criteria – Scheduling algorithms – Thread scheduling – Multiple-processor scheduling – Operating system examples – Algorithm Evaluation – The critical-section problem – Peterson's solution – Synchronization hardware – Semaphores – Classic problems of synchronization – Critical regions – Monitors – Synchronization examples – Deadlocks – System model – Deadlock characterization – Methods for handling deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock detection – Recovery from deadlock.

UNIT–IIISTORAGE MANAGEMENT

Memory Management – Swapping – Contiguous memory allocation – Paging –Segmentation – Example: The Intel Pentium - Virtual Memory: Background – Demand paging – Copy on write – Page replacement – Allocation of frames – Thrashing.

UNIT –IVI/O SYSTEMS

File concept – Access methods – Directory structure – File-system mounting – Protection – Directory implementation – Allocation methods – Free-space management – Disk scheduling – Disk management – Swap-space management – Protection.

UNIT –V CASE STUDY

The Linux System – History – Design Principles – Kernel Modules – Process Management – Scheduling – Memory management – File systems – Input and Output – Inter-process Communication – Network Structure – Security – Windows 7 – History – Design Principles – System Components – Terminal Services and Fast User – File system – Networking.

Text Book(s):

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, —Operating System Concepts Essentials, John Wiley & Sons Inc., 2010.

Reference Book(s):

1. Andrew S. Tanenbaum, —Modern Operating Systems, Second Edition, Addison Wesley, 2001.
2. D M Dhamdhere, —Operating Systems: A Concept-based Approach, Second Edition, Tata McGraw-Hill Education, 2007.
3. Charles Crowley, —Operating Systems: A Design-Oriented Approach, Tata McGraw Hill Education, 1996.
4. William Stallings, —Operating Systems: Internals and Design Principles, Seventh Edition, Prentice Hall, 2011.

SEMESTER - II

PCST22– RELATIONAL DATABASE MANAGEMENT SYSTEM

Objectives:

OBJ1 :To correlate the role of database management systems in information technology applications within organization

OBJ2 :To sketch basic database concepts, including the structure and operation of the relational data model

COURSE OUTCOMES:

CO1 :Articulate the use of contemporary logical design methods and tools for databases

CO2 : Understand the relationship between Transaction Processing and Databases

UNIT – I DATABASE FUNDAMENTALS

Purpose of Database Systems – View of Data - Database System Architecture – Database Users and Administrators – Data Models – Entity Relationship Model – Constraints - Entity Sets – Attributes – Keys - E-R Diagrams - Design Issues - Extended E-R Features - Introduction of Relational Model – E-R Reduction to Relational Schemas.

UNIT – RELATIONAL DATABASE MODEL II

Structure of Relational Databases – Schema Diagrams – Relational Query Languages - Relational Algebra – Queries in SQL – Set Operations – Aggregate Operations – Joins – Views – Integrity Constraints – Authorization – Advanced SQL – Functions and Procedures – Triggers – Assertion – Embedded SQL – Dynamic SQL- SQL Application Programming using C and Java.

UNIT – LOGICAL DATABASE DESIGN III

Need for good database design – Functional Dependencies and Keys – Closure of Functional Dependencies Set – Closure of attributes - Dependency Preservation - Decomposition using Functional dependencies – Atomic domains and First Normal Form – Second Normal Form – Third Normal Form – Boyce Codd Normal Form – Multivalued Dependencies - Decomposition using Multivalued dependencies – Fourth Normal Form – Join Dependencies – Fifth Normal Form – Introduction to Domain Key Normal Form – Case Studies

UNIT – DATABASE TRANSACTIONS AND CONCURRENCY IV CONTROL

Transaction Model – ACID properties – Transaction States – Serializability - Conflict serializability – View Serializability – Testing Serializability - Concurrency Control – Lock Based Protocols – Deadlocks – Multiple Granularity – Time Stamp Based Protocols – Validation Based Protocols – Multi Version Schemes – Recovery System – Failure Classification – Storage – Recovery and Atomicity – Recovery Algorithm.

UNIT – QUERY PROCESSING AND OPTIMIZATION

V

Query Processing - Measures of Query Cost - Selection– Sorting - Join Operation – Other Operations - Evaluation of Expressions –Database Tuning - Query Optimization - Transformation of Relational Expressions - Estimating Statistics of Expression Results - Choice of Evaluation Plans – Materialized Views.

Text Book(s):

1. Henry F Korth, Abraham Silberschatz, S. Sudharshan, “Database System Concepts”, McGraw Hill, Sixth Edition, 2011.
2. C.J.Date, A.Kannan and S.Swamynathan, ”An Introduction to Database Systems”, Pearson Education, Eighth Edition, 2006.

REFERENCE BOOKS:

1. R. Elmasri, S.B. Navathe, “Fundamentals of Database Systems”, Pearson Education/Addison Wesley, Sixth Edition, 2014.
2. Thomas Cannolly and Carolyn Begg, “Database Systems, A Practical Approach to Design, Implementation and Management”, Pearson Education, Fifth Edition, 2009.
3. Raghu Ramakrishnan, Johannes Gehrke, “Database Management Systems”, McGraw Hill, Third Edition, 2004.

SEMESTER - II

PCST23– COMPUTER NETWORKS

Objective(s):

OBJ1 :To study layered architecture of computer networks and protocols.

OBJ2 :To learn the various mediums used in the physical layer.

OBJ3 :To study the functionalities of data link layer.

COURSE OUTCOMS :

CO1 :Learn the routing algorithms and the use of IP addressing in the network layer.

CO2 :Understand the working of transport layer.

CO3 :Learn to design secure network applications.

UNIT – I INTRODUCTION, PHYSICAL LAYER

Overview: Data Communication - Network Types - Internet History - TCP/IP Protocol Suite - The OSI Model - Digital Signals - Data rate limits - Performance - Line Coding - Block Coding - Transmission Media: Guided Media - Unguided Media – Switching.

UNIT – II DATA LINK LAYER

Link Layer Addressing - ARP - Error Detection and Correction - Data Link Control Services - Data Link Layer Protocols - HDLC - PPP - Media Access Control - Ethernet - Wireless LANs: IEEE 802.11, Bluetooth -Connecting Devices.

UNIT – III NETWORK LAYER

Network layer Services - Packet switching - Performance - IPV4 addresses - Forwarding of packets - Internet Protocol - ICMPV4 - Mobile IP - Routing algorithms - Routing Protocols - IPV6 addressing - IPV6 protocol -Transition from IPV4 to IPV6

UNIT – IV TRANSPORT LAYER

Transport Layer Services - Protocols - UDP - TCP: Transition Diagram, Flow Control, Error Control, Congestion Control - SCTP - QoS: Flow Control to improve QoS - Integrated Services - Differentiated Services - Client Server Programming.

UNIT – V APPLICATION LAYER AND SECURITY

World Wide Web and HTTP - FTP - Electronic Mail - Telnet - Secure Shell - Domain Name System - Cryptographic Algorithms - Authentication Protocols - Message Integrity Protocols - Public Key Distribution(X.509) - Network Layer Security - Transport Layer Security - Application Layer Security - Firewalls.

Text Book(s):

1. Behrouz A. Foruzan, "Data communication and Networking", Tata McGraw-Hill, Fifth Edition, 2013
2. Larry L. Peterson, Bruce S. Davie, "Computer Networks: A Systems Approach", Morgan Kauffmann Publishers Inc., Third Edition, 2003.

Reference Book(s):

1. James F. Kuross, Keith W. Ross, "Computer Networking, A Top-Down Approach Featuring the Internet", Addison Wesley, ThirdEdition,2004.
2. Pete Loshin, "IPv6: Theory, Protocol and Practice", ELSEVIER, Morgan Kauffmann Publishers Inc., Second edition, 2004
3. William Stallings, "Data and Computer Communication", Pearson Education, Sixth Edition, 2000.
4. Andrew S. Tannenbaum, "Computer Networks", Pearson Education, Fourth Edition, 2003
5. D.E. Comer, "Internetworking with TCP/IP Vol- III", (BSD Sockets Version), Pearson Education, Second Edition, 2003.
6. W. Richard Stevens, "UNIX Network Programming Vol-I", Pearson Education, Second Edition, 1998.

SEMESTER - II

PCSP22– RDBMS LAB

COURSE OUTCOMES:

CO1 :To Develop Queries using SQL, Programs in PL/SQL and to Create application using front and back end tools.

LIST OF EXPERIMENTS

1. Create an Employee Database with related tables like employee table, department table, and project table. Construct the table relationship with relevant constraints. Perform all DDL, DML, and TCL operations.
2. Create a student database with related tables like student personal Table and marks table. Perform the following operation:
 - I. Create a view which contains top five students of a class
 - II. Create two different views which contain the students details whose results are pass and fail respectively.
3. Create a Bank database with customer table and account table.
 - I. Design a trigger that doesn't allow user to do any DML operations during Sunday.
 - II. Design a trigger that doesn't let the minimum balance to fall below Rs. 1000/-
 - III. The transaction amount is not Zero and is positive.
4. Design the database objects Synonym, Sequences, Indexes for the Bank Database.
5. Creation of Partitions for a student mark table by using range partition method.
6. Simulate a payroll processing system using PL/SQL.
7. Develop a Package incorporating simple functions and procedures for an Inventory management system.
8. Write a PL/SQL block that will display the customer name, the fixed deposit number and the fixed deposit amount of the first five customers holding the highest amount in fixed deposits.
9. Write a PL/SQL block of code that depending upon a user supplied account number, the customer to which the account belongs, the introducer of the account and the nominee of the account are inserted into the ACCT_CUST_INTRO_NOM table. If the user enters an account number that is not in the ACCT_MSTER table, then the PL/SQL block must display appropriate error message back to the user.
10. Design and develop an application for bank using VB as a front end and ORACLE as a back end Tool.

SEMESTER III

PCST31– COMPILER DESIGN

Objectives:

OBJ1 :To learn the various parsing techniques and different levels of translation

OBJ2 :To learn how to obtain specific object code from source language

COURSE OUTCOMES:

CO1 :Learn how to optimize the code and schedule for optimal performance

UNIT – IFRONT END OF COMPILERS

The Structure of Compiler – Lexical Analysis: Role of Lexical Analyzer, Specification and Recognition of Tokens, Syntax Analysis: Top Down Parsing, Bottom up Parsing, LR Parsers: SLR, CLR, and LALR.

UNIT – IIINTERMEDIATE CODE GENERATION

Syntax Directed Definitions, Evaluation Orders for Syntax Directed Definitions, Syntax Directed Translation Schemes, Intermediate Languages: Syntax Tree, Three Address Code, Postfix Code, Declarations, Translation of Expressions, Type Checking, Back Patching.

UNIT – IIIRUNTIME AND OBJECT CODE GENERATION

Storage Organization, Stack Allocation Space, Access to Non-local Data on the Stack, Heap Management - Issues in Code Generation - Design of Code Generator - Register Allocation and Assignment – Instruction Selection by Tree Rewriting – Optimal Code Generation for Expressions – Dynamic Programming Code Generation.

UNIT – IV CODE OPTIMIZATION

Basic Blocks and Flow Graphs – Optimization of Basic Blocks – Principal Sources of Optimizations – Data Flow Analysis – Constant Propagation – Partial Redundancy Elimination – Peephole Optimizations.

UNIT – V SCHEDULING AND OPTIMIZING FOR PARALLELISM

Code Scheduling Constraints – Basic Block Scheduling – Global Code Scheduling - Basic Concepts in Parallelization – Parallelizing Matrix Multiplication – Iteration Spaces – Affine Array Indexes.

Text Book(s):

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D. Ullman, —Compilers: Principles, Techniques and Tools, Second Edition, Pearson Education, 2009.

Reference Book(s):

1. Randy Allen, Ken Kennedy, —Optimizing Compilers for Modern Architectures: A Dependence-based Approach, Morgan Kaufmann Publishers, 2002.
2. Steven S. Muchnick, —Advanced Compiler Design and Implementation, Morgan Kaufmann Publishers - Elsevier Science, India, Indian Reprint 2003.
3. Keith D Cooper and Linda Torczon, —Engineering a Compiler, Morgan Kaufmann Publishers Elsevier Science, 2004.
4. V. Raghavan, —Principles of Compiler Design, Tata McGraw Hill Education Publishers, 2010.
5. Allen I. Holub, —Compiler Design in C, Prentice-Hall Software Series, 1993.

SEMESTER - III

PCST32– SOFTWARE ENGINEERING

Objectives:

OBJ1 :To be aware of generic models to structure the software development process.

OBJ2 :To understand fundamental concepts of requirements engineering and requirements specification.

COURSE OUTCOMES:

CO1 :Understand different notion of complexity at both the module and system level.

CO2 :Aware of some widely known design methods.

UNIT – I SOFTWARE PROCESS MODELS

The Evolving Role of Software – Software – The changing Nature of Software – Legacy software — A generic view of process– A layered Technology – A Process Framework – The Capability Maturity Model Integration (CMMI) – Process Assessment –Personal and Team Process Models – Product and Process – Process Models – The Waterfall Model – Incremental Process Models – Incremental Model – The RAD Model – Evolutionary Process Models – Prototyping – The Spiral Model – The Concurrent Development Model – Specialized Process Models – The Unified Process.

UNIT – II REQUIREMENT ENGINEERING

Software Engineering Practice – Communication Practice – Planning Practice - Modeling Practice– Construction Practice –Deployment. Requirements Engineering - Requirements Engineering Tasks – Initiating the Requirements Engineering Process - Eliciting Requirements – Developing Use Cases – Building the Analysis Models –Elements of the Analysis Model – Analysis Pattern – Negotiating Requirements – Validating Requirements.

UNIT – III ANALYSIS MODELLING

Requirements Analysis – Analysis Modeling Approaches – Data Modeling Concepts – Object Oriented Analysis – Scenario Based Modeling – Flow Oriented Modeling – Class Based Modeling – Creating a Behaviour Model.

UNIT – IV DESIGN AND TESTING

Design Engineering – Design Process -Design Quality - Design Model - User Interface Design – Testing Strategies - Testing Tactics - Strategies Issues for Conventional and Object Oriented Software - Validation Testing – System Testing – Art of Debugging – Project Management

UNIT –V QUALITY AND MAINTENANCE

Software Evolution - Verification and Validation -Critical Systems Validation – Metrics for Process,

Text Book(s):

1. Roger S. Pressman, —Software Engineering: A Practitioner's Approach, McGraw Hill International edition, Seventh edition, 2009.
2. Ian Sommerville, —Software Engineering, Ninth Edition, Pearson Education, 2008.

Reference Book(s):

1. Stephan Schach, —Software Engineering, Tata McGraw Hill, 2007
2. Pfleeger and Lawrence —Software Engineering: Theory and Practice, Pearson Education, Second edition, 2001

SEMESTER - III
PCST33– WEB PROGRAMMING

Objectives:

OBJ1 :To learn to design web pages using HTML5

OBJ2 :To gain knowledge on creating interactive web pages using JavaScript, jQuery

OBJ3: To know to use Cascading Style Sheets (CSS) and DOM.

COURSE OUTCOMES:

CO1 :Study different technologies related to XML

CO2 :Learn to develop server side scripting using PHP

UNIT – I BASICS INTERNET PROTOCOLS, HTML5

Basic Internet Protocols - The World Wide Web - HTTP messages - Web servers and clients - Introduction to HTML5 - Editing HTML5 - W3C HTML validation service - Headings - Linking - Images - Special characters and horizontal rules - Lists - Tables - Forms - Internal linking - Meta elements - New HTML5 Form input types - Input and datalist elements and auto complete attribute - Page structure elements - Introduction to Canvas - Canvas Coordinate System - Rectangles - Drawing Arcs and Circles - Shadows

UNIT – II JAVASCRIPT, JQUERY

Introduction to JavaScript - Syntax - Variables and data types - JavaScript Control Statements - Operators - Literals - Functions - Objects - Arrays - Built in objects - Event handling - Fundamentals of JQuery - JQuery selectors - JQuery methods to access HTML attributes - Traversing - Manipulators - Events - Effects

UNIT – III CSS3, DOM

Types of CSS - Conflicting style sheets - Positioning Elements - Element Dimension - Box model and Text Flow - Media types - Media Queries - Drop-Down Menus - Text shadows - Rounded corners - Color - Box Shadows - Introduction to the Document Object Model - DOM History and Levels - Intrinsic Event Handling - Modifying Element Style - The Document Tree - Properties of window - DOM Collections - Using Timer and Dynamic Styles to Create Animated Effects - JavaScript Event Handling - Reviewing the load, mousemove, mouseover, mouseout events - Form processing with focus, blur, submit, reset - Event Bubbling - More Events

UNIT – IV XML AND PHP

XML documents and vocabularies - XML versions and declarations - XML namespace - Representing data types : DTD, XML schema - XSLT - XPath - XQuery - Introduction to PHP - Converting Between Data Types - Arithmetic Operators - Initializing and Manipulating Arrays - String Comparisons - String Processing with Regular Expressions - Form Processing and Business Logic - Reading from a Database - Using Cookie - Dynamic Content.

UNIT – V AJAX AND WEB SERVICES

Ajax - Enabled rich internet applications with XML and JSON - Web Services Introduction - WCF Services Basics - SOAP - REST - JSON - Publishing and Consuming SOAP-Based Web Services, REST-Based XML Web Services, REST-Based JSON Web Services

Text Book(s):

1. P.J.Deitel, H.M.Deitel, “Internet and World Wide Web - How to program”, Pearson Education Publishers, Fifth Edition, 2009.
2. Jeffrey C. Jackson, "Web Technologies - A Computer Science Perspective", Pearson Education, 2007.

Reference Book(s):

1. Robert. W. Sebesta, "Programming the World Wide Web", Pearson Education, Fourth Edition, 2007.
2. Kogent Learning Solutions Inc., “Html5 Black Book: Covers CSS3, JavaScript, XKL, XHTML, AJAX, PHP and jQuery”, Dreamtech Press, 2011.
3. Joe Fawcett, Danny Ayers, Liam R. E. Quin, “Beginning XML”, John Wiley & Sons Publisher, Fifth Edition, 2012
4. Bates, “Developing Web Applications”, Wiley, 2006.

SEMESTER III
PCSP33– WEB PROGRAMMING LAB

Objectiv(s):

OBJ1 :Try and develop the most important technologies that are being used today by web developers to build a wide variety of web applications.

OBJ2: To develop Java based web programming.

COURS OUTCOMES:

CO1: Build web applications using proven developer tools and message formats.

CO2 :Web applications using technologies such as Java, Javascript, AJAX, Ruby on Rails, Django, XML, RSS, XSLT, and JSON.

LIST OF EXPERIMENTS

1. Using InetAddress class, Socket Programming in Java
2. RMI
3. Client side scripting using
 - XHTML
 - Javascript – DOM
 - CSS
4. XML DTD, Parsers, XSLT, XPATH, SAX
5. Programming with AJAX, JQuery, JSON
6. Server Side programming (implement these modules using any of the server side scripting languages like PHP, Servlets, JSP etc.,
 - Gathering form data , Querying the database ,Response generation ,Session management , MySQL/JDBC/Oracle
7. Case Study – Sample Application development
8. Ruby-on-Rails setup and programming
9. Django, Jena – Integrating Databases and applications
10. JAX – RPC
11. WSDL
12. SOAP

SEMESTER IV

PCST41- DIGITAL IMAGE PROCESSING

Objectives:

OBJ1: To understand the basic principles of digital image processing;

OBJ2: To Design and implement algorithms on basic image processing

OBJ3: To Design and implement algorithms for advanced image analysis

Course Outcomes:

CO 1: Analyze general terminology of digital image processing.

CO 2: Get broad exposure to and understanding of various applications of image processing in industry, medicine, and defense.

CO 3: Understanding image formation.

Unit I

Introduction: The Origins of Digital Image Processing – Application of Digital Image processing – Fundamental Steps in Digital Image Processing – Component of Image Processing System.

Image Acquisition - Image Acquisition using a single sensor – Image Acquisition using sensor arrays.

Unit II

Image Sampling and Quantization: Basic Concepts- Representing Digital Images – Spatial and gray level resolution – Aliasing & More Patterns– zooming and shrinking Digital Images

Basic Relationships between pixels: Neighbors of a pixel – Adjacency, connectivity, regions and boundaries – Distance Measures, Image operations on a pixel Basis.

Unit III

Color Image Processing: Fundamentals – Color Models: RGB Color model – CMY & CMYK color model – HIS model – Color Image Smoothing & Color Image Sharpening

Image Enhancement in Spatial Domain: Gray level transformation: Image negatives-Log transformations – Piecewise-Linear transformation function – Enhancement using arithmetic / logic operations: Image subtraction – Image Averaging.

Unit IV

Image Compression: Fundamentals: Coding redundancy – Interpixel redundancy – Psychovisual redundancy – Image compression models: The source Encoder and Decoder – The channel Encoder and Decoder.

Unit V

Image Segmentation: Detection of Discontinuities: Point Detection – Line Detection - Edge Detection.

Representation of Images: Chain codes – Polygonal approximation – Signatures – Boundary Segments – Skeletons.

Text Books:

Digital Image Processing – Second Edition – Rafael C. Gonzalez and Richard E. Woods

Reference Book(s):

1. Anil K.Jain, “Fundamentals of Digital Image Processing”, PHI, 2011.
1. Milan Sonka, Vaclav Hlavac and Roger Boyle, “Image Processing, Analysis and Machine Vision”, Thompson Learning, Second Edition, 2007.
2. William K Pratt, “Digital Image Processing”, John Willey, 2002.
3. Malay K. Pakhira, “Digital Image Processing and Pattern Recognition”, PHI Learning Pvt. Ltd., First Edition, 2011.
4. Sanjit K. Mitra and Giovanni L. Sicuranza, “Non Linear Image Processing”, Elsevier, 2007.
5. S.Sridhar, “Digital Image Processing”, Oxford University Press, 2011.

PCST42 – MOBILE COMPUTING

SEMESTER IV

Objectives:

OBJ1 :To clearly understanding the mobile communications environment

OBJ2 :To get clear idea about Satellite Systems

COURSE OUTCOMES:

CO1 :Make clear idea about the GSM Technology

UNIT – I INTRODUCTION

Introduction: Applications - A Simplified Reference Model. Wireless Transmission: Frequencies for radio transmission – Signals – Antennas - Signal Propagation – Multiplexing – Modulation – Spread Spectrum - Cellular System.

UNIT – II MEDIUM ACCESS CONTROL

Medium Access Control: Motivation for a Specialized MAC- Hidden and exposed terminals – Near and far terminals – SDMA – FDMA – TDMA - Fixed TDM – Classical Aloha – Slotted Aloha – Carrier Sense Multiple Access – Demand assigned Multiple Access – PRMA Packet Reservation Multiple Access – Reservation TDMA – Multiple Access with Collision Avoidance – Polling – Inhibit Sense Multiple Access. CDMA - Spread Aloha multiple access. Comparison of S/T/F/CDMA.

UNIT – III TELECOMMUNICATION SYSTEMS

Telecommunication Systems: GSM - Mobile Services – System Architecture – Radio Interface – Protocols - Localization and Calling – Handover – Security. UMTS and IMT 2000: UMTS releases and standardization - UMTS System Architecture - UMTS Radio Interface –UTRAN - UMTS Handover.

UNIT – IV SATELLITE SYSTEM

Satellite System: History – Applications – Basics - Routing– Localization – Handover. Wireless LAN: IEEE 802.11- System Architecture – Protocol Architecture - Physical Layer – Medium Access Control Layer. Bluetooth: User scenarios – Architecture – Radio Layer – Baseband Layer – Link Manager Protocol.

UNIT – V MOBILE NETWORK LAYER

Mobile Network Layer: Mobile IP - Goals, Assumption, and Requirements – Entities and Terminology – IP Packet delivery – Agent discovery – Registration. Dynamic Host Configuration Protocol - Mobile Transport Layer: Traditional TCP - Congestion Control – Slow Start – Fast Retransmit.

Text Book(s):

1. Jochen Schiller, "Mobile Communications", 2nd Edition, eighth impression, Pearson Education, 2011.

Reference Book(s):

1. William Stallings, "Wireless Communication and Networks", 2nd Edition, Pearson Education, 2005.
2. Theodore Rappaport, "Wireless Communications: Principles and Practice", Prentice Hall Communications, 1996.

SEMESTER - I
ELECTIVE – I
PCSE11– SOFT COMPUTING

Objective(s):

OBJ1 :To give students knowledge of soft computing theories fundamentals,

OBJ2 :To learn the fundamentals of non-traditional technologies and approaches to solving hard real-world problems.

OBJ3: To learn and apply artificial neural networks, fuzzy sets and fuzzy logic, and genetic algorithms in problem solving and use of heuristics based on human experience

COURSE OUTCOME

CO1: Introduce the ideas of fuzzy sets, fuzzy logic To become familiar with neural networks that can learn from available examples and generalize to form appropriate rules for inferencing systems

CO2 :Familiarize with genetic algorithms and other random search procedures useful while seeking global optimum in self-learning situations

UNIT – I NEURAL NETWORKS - I

(Introduction and Architecture) Neuron, Nerve Structure and Synapse, Artificial Neuron and its Model, Activation Functions, Neural Network Architecture: Single Layer and Multilayer Feed Forward Networks, Recurrent Networks. Various Learning Techniques; Perception and Convergence Rule, Auto-Associative and Hetro-Associative Memory.

UNIT – NEURAL NETWORKS - II

(Back Propagation Networks) Architecture: Perceptron Model, Solution, Single Layer Artificial Neural Network, Multilayer Perception Model; Back Propagation Learning Methods, Effect of Learning Rule Co-Efficient ;Back Propagation Algorithm, Factors Affecting Back Propagation Training, Applications.

UNIT – FUZZY LOGIC - I

(Introduction) Basic Concepts of Fuzzy Logic, Fuzzy Sets and Crisp Sets, Fuzzy Set Theory and Operations, Properties of Fuzzy Sets, Fuzzy and Crisp Relations, Fuzzy to Crisp Conversion.

UNIT – FUZZY LOGIC – II

IV

(Fuzzy Membership, Rules) Membership Functions, Interference in Fuzzy Logic, Fuzzy If-Then Rules, Fuzzy Implications and Fuzzy Algorithms, Fuzzifications and Defuzzifications, Fuzzy Controller, Industrial Applications

UNIT – GENETIC ALGORITHM

V

Basic Concepts, Working Principle, Procedures of GA, Flow Chart of GA, Genetic Representations, (Encoding) Initialization and Selection, Genetic Operators, Mutation, Generational Cycle, Applications.

Text Book(s):

1. S. Rajasekaran and G.A. VijayalakshmiPai, —Neural Networks, Fuzzy Logic and Genetic Algorithm: Synthesis and Applications, Prentice Hall of India, 2003.
2. N.P.Padhy, —Artificial Intelligence and Intelligent Systems, Oxford University Press, 2005.
3. J.S.R. Jang, C.T. Sun and E. Mizutani, —Neuro-Fuzzy and Soft Computing, Pearson Education, 2004.

Reference Book(s):

1. Simon Haykin, —Neural Networks, Prentice Hall of India, 1999
2. Timothy J. Ross, —Fuzzy Logic with Engineering Applications, Third Edition, Wiley India, 2010
3. S.Y.Kung, —Digital Neural Network, Prentice Hall International, 1993.
4. Aliev.R.A and Aliev,R.R, — Soft Computing and its Application, World Scientific Publishing Company, 2001.
5. Wulfram Gerstner and Werner Kristler, —Spiking Neural Networks, Cambridge University Press.
6. Bart Kosko, —Neural Networks and Fuzzy Systems: Dynamical Systems Application to Machine Intelligence, Prentice Hall, 1992.

SEMESTER - II

ELECTIVE – II

PCSE22– DATA WAREHOUSING AND DATA MINING

Objective(s):

OBJ1: To make the students to understand data mining principles and techniques

OBJ2 :To discover the knowledge imbibed in the high dimensional system.

OBJ3 :To study algorithms for finding the hidden interesting patterns in data.

COURSE OUTCOME

CO1 : Expose the students to the concepts of Data warehousing Architecture and Implementation.

CO2 :Chance to Know the overview of developing areas – Web mining, Text mining and Big Data Mining Tools of Data mining.

UNIT – I INTRODUCTION TO DATAWAREHOUSING

Evolution of Decision Support Systems- Data Warehousing Components –Building a Data Warehouse, Data Warehouse and DBMS, Data Marts, Metadata, Multidimensional Data Model, OLAP vs. OLTP, OLAP Operations, Data Cubes, Schemas for Multidimensional Database: Stars, Snowflakes and Fact Constellations.

UNIT – II DATAWAREHOUSE PROCESS AND ARCHITECTURE

Types of OLAP Servers, 3 –Tier Data Warehouse Architecture, Distributed and Virtual Data Warehouses. Data Warehouse Implementation, Tuning and Testing of Data Warehouse. Data Staging (ETL) Design and Development, Data Warehouse Visualization, Data Warehouse Deployment, Maintenance, Growth, Business Intelligence Overview - Data Warehousing and Business Intelligence Trends - Business Applications - Tools – SAS.

UNIT – III INTRODUCTION TO DATA MINING

Data Mining - KDD versus Data Mining, Stages of the Data Mining Process- Task Primitives, Data Mining Techniques - Data Mining Knowledge Representation – Data Mining Query Languages, Integration of a Data Mining System with a Data Warehouse – Issues, Data preprocessing – Data Cleaning, Data Transformation, Feature Selection, Dimensionality Reduction, Discretization and Generating Concept Hierarchies - Mining Frequent Patterns Association- Correlation.

UNIT – IV CLASSIFICATION AND CLUSTERING

Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back Propagation – Support Vector Machines – Associative Classification – Lazy Learners – Other Classification Methods - Clustering techniques – Partitioning Methods - k-means- Hierarchical Methods - Distance-based Agglomerative and Divisible Clustering, Density-Based Methods – Expectation Maximization - Grid Based Methods – Model-Based Clustering Methods – Constraint – Based Cluster Analysis – Outlier Analysis.

UNIT – V TRENDS IN DATAMINING AND BIG DATA MINING

Introduction to Big Data-Case Studies on Big Data Mining Tools: Apache Hadoop, Apache Mahout and R - Mining Complex Data Objects, Spatial Databases, Temporal Databases, Multimedia Databases, Time Series and Sequence Data; Text Mining – Web Mining- Application and Trends in Data Mining.

Text Book(s):

- 1 Jiawei Han and MichelineKamber, —Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, Third Edition, 2011.
- 2 Paul Zikopoulos, Chris Eaton, Dirk DeRoos, Tom Deutsch, George Lapis, —Understanding Big Data: Analytics for Enterprise Class Hadoop and Streaming, McGraw-Hill Osborne Media, First Edition, 2011.

Reference Book(s):

- 1 Mehmed Kantardzic, —Datamining Concepts, Models, Methods, and Algorithms, Wiley Interscience, 2003.
- 2 Alex Berson and Stephen J. Smith, —Data Warehousing, Data Mining and OLAP, Tata McGraw Hill Edition, Tenth Reprint 2007.
- 3 G. K. Gupta, —Introduction to Data Mining with Case Studies, Eastern Economy Edition, Prentice Hall of India, 2006.
- 4 Gareth James, Daniela Witten, Trevor Hastie, RobertTibshirani, —An Introduction to Statistical Learning: with Applications in R, Springer, 2014.

SEMESTER - II

ELECTIVE – II

PCSE22– CRYPTOGRAPHY AND NETWORK SECURITY

Objective(s):

OBJ1 :To understand security design principles

OBJ2 :To learn secure programming techniques

OBJ3 :To understand the mathematics behind cryptography

COURSE OUTCOMES

CO1 : know the standard algorithms used to provide confidentiality, integrity and authenticity

CO2 : Understand the security requirements in operating systems and databases

CO3: Learn about the security applications in wireless environment.

UNIT – IINTRODUCTION& NUMBER THEORY

Services, Mechanisms and attacks-the OSI security architecture-Network security model-Classical Encryption techniques (Symmetric cipher model, substitution techniques, transposition techniques, steganography).FINITE FIELDS AND NUMBER THEORY: Groups, Rings, Fields-Modular arithmetic-Euclid's algorithm-Finite fields- Polynomial Arithmetic –Prime numbers-Fermat's and Euler's theorem-Testing for primality -The Chinese remainder theorem- Discrete logarithms.

UNIT – IIBLOCK CIPHERS & PUBLIC KEY CRYPTOGRAPHY

Data Encryption Standard-Block cipher principles-block cipher modes of operation-Advanced Encryption Standard (AES)-Triple DES-Blowfish-RC5 algorithm. Public key cryptography: Principles of public key cryptosystems-The RSA algorithm-Key management - Diffie Hellman Key exchange-Elliptic curve arithmetic-Elliptic curve cryptography.

UNIT – IIHASH FUNCTIONS AND DIGITAL SIGNATURES

Authentication requirement – Authentication function – MAC – Hash function – Security of hash function and MAC –MD5 - SHA - HMAC – CMAC - Digital signature and authentication protocols – DSS – El Gamal – Schnorr.

UNIT – IVSECURITY PRACTICE & SYSTEM SECURITY

Authentication applications – Kerberos – X.509 Authentication services - Internet Firewalls for Trusted System: Roles of Firewalls – Firewall related terminology- Types of Firewalls - Firewall designs - SET for E-Commerce Transactions. Intruder – Intrusion detection system – Virus and related threats – Countermeasures – Firewalls design principles – Trusted systems – Practical implementation of cryptography and security.

UNIT V E-MAIL, IP & WEB SECURITY

E-mail Security: Security Services for E-mail-attacks possible through E-mail - establishing keys privacy-authentication of the source-Message Integrity-Non-repudiation-Pretty Good Privacy-S/MIME. IPSecurity: Overview of IPsec - IP and IPv6-Authentication Header-Encapsulation Security Payload (ESP)-Internet Key Exchange (Phases of IKE, ISAKMP/IKE Encoding). Web Security: SSL/TLS Basic Protocol-computing the keys- client authentication-PKI as deployed by SSLAttacks fixed in v3- Exportability-Encoding-Secure Electronic Transaction (SET).

Text Book(s):

1. William Stallings, Cryptography and Network Security, 6 th Edition, Pearson Education, March 2013.
2. Charlie Kaufman, Radia Perlman and Mike Speciner, “Network Security”, Prentice Hall of India, 2002.

Reference Book(s):

1. Behrouz A. Ferouzan, “Cryptography & Network Security”, Tata Mc Graw Hill, 2007.
2. Man Young Rhee, “Internet Security: Cryptographic Principles”, “Algorithms and Protocols”, Wiley Publications, 2003.
3. Charles Pfleeger, “Security in Computing”, 4th Edition, Prentice Hall of India, 2006.
4. Ulysess Black, “Internet Security Protocols”, Pearson Education Asia, 2000.
5. Charlie Kaufman and Radia Perlman, Mike Speciner, “Network Security, Second Edition, Private Communication in Public World”, PHI 2002.
6. Bruce Schneier and Neils Ferguson, “Practical Cryptography”, First Edition, Wiley Dreamtech India Pvt Ltd, 2003.
7. Douglas R Simson “Cryptography – Theory and practice”, First Edition, CRC Press, 1995.

SEMESTER -III

ELECTIVE –III

PCSE33– SOFTWARE PROJECT MANAGEMENT

Objectives:

OBJ1 :To estimate the cost associated with a project

OBJ2 :To plan and monitor projects for the risk management

OBJ3 :To explore the process of monitoring and controlling

COURSE OUTCOMES

CO1:Manage people and organization of teams

CO2: Study various software development standards

UNIT – I INTRODUCTION

Project Definition – Contract Management – Activities covered by Software Project Management – Overview of Project Planning – Stepwise Project Planning - Project evaluation - Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation

UNIT – II ACTIVITY PLANNING

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning And Control

UNIT – III MONITORING AND CONTROL

Creating Framework – Collecting the Data – Visualizing Progress – Cost Monitoring – Earned Value – Prioritizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types of Contract – Stages in Contract Placement – Typical Terms of a Contract – Contract Management – Acceptance

UNIT – IV MANAGING PEOPLE AND ORGANIZING TEAMS

Understanding Behavior – Organizational Behavior – Selecting The Right Person For The Job – Instruction in the Best Methods – Motivation – The Oldham Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies

UNIT – V DEVELOPMENT AND MANAGEMENT STANDARDS

Microsoft solution Framework - PMBOK Guide - NASA practices - PRINCE 2 - Capability Maturity Model - Integration - open source tools for managing projects: Project information flow - basic infrastructure - collaborative document writing

Text Book(s):

1. Bob Hughes, Mike Cotterell, “Software Project Management”, Fifth Edition, Tata McGraw Hill, 2011
2. Adolfo Villafiorita, “Introduction to Software Project Management”, CRC Press 2014

Reference Book(s):

1. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill, 2001.
2. Royce, “Software Project Management”, Pearson Education, 1999
3. Jalote, “Software Project Management in Practice”, Pearson Education, 2002

SEMESTER - III

ELECTIVE – III

PCSE33– BIG DATA ANALYTICS

Objective(s):

OBJ1 :To know the fundamental concepts of big data and analytics.

OBJ2 :To explore tools and practices for working with big data

OBJ3 :To learn about stream computing.

OBJ4: To know about the research that requires the integration of large amounts of data.

Course Outcome:

CO1: learn about stream computing.

CO2: know about the research that requires the integration

UNIT – I INTRODUCTION TO BIG DATA

Introduction – understanding Big data-capturing bigdata-Volume-velocity-variety-veracity-Benefiting Big Data –Management of bigdata- organizing big data- Technology challenges

UNIT – II BIGDATA SOURCES AND ARCHITECTURE

Big data sources-people to people communication-m2m- big data applications- Examining big data types- structured data – unstructured data- semi structured data-integrating data type into big data environment-Big data Architecture.

UNIT – II HADOOP

Big Data – Apache Hadoop & Hadoop EcoSystem – Moving Data in and out of Hadoop – Understanding inputs and outputs of MapReduce - Data Serialization- Hadoop Architecture, Hadoop Storage. Hadoop MapReduce paradigm, Map and Reduce tasks, Job, Task trackers-: HDFS- Hive Architecture and Installation, Comparison with Traditional Database, HiveQL - Querying Data - Sorting and Aggregating, Map Reduce Scripts, Joins &Subqueries, HBase

UNIT – IV ANALYTICS AND BIG DATA

Basic analytics-Advanced analytics-operationalized analytics-Monetizing analytics-modifying business intelligence products to handle big data- big data analytics solution-understanding text analytics-tools for big data.

UNIT – V DATA VISUALIZATION & R

Introduction-excellence in visualization- types of chart-Business Intelligence: Tools-skills-applications – Health care- Education-retail – E- Governance – Working with R- Import a data set in R- plotting a histogram-Big data mining

Text Book(s):

1. Anil Maheshwari, Data Analytics Made Accessible: 2017 edition Kindle Edition
2. Judith Hurwitz, Alan Nugent, Dr. Fern Halper, Marcia Kaufman “ Big Data for Dummies “
wiley India Pvt.Ltd.New Delhi, 2014

Reference Book(s):

1. Boris lublinsky, Kevin t. Smith, Alexey Yakubovich, “Professional Hadoop Solutions”, Wiley,
ISBN: 9788126551071, 2015.
2. Chris Eaton, Dirk deroos et al., “Understanding Big data ”, McGraw Hill, 2012.
3. Tom White, “HADOOP: The definitive Guide”, O Reilly 2012. 6 IT2015 SRM(E&T)
4. Tom Plunkett, Brian Macdonald et al, “Oracle Big Data Handbook”, Oracle Press, 2014.
5. JyLiebowitz, “Big Data and Business analytics”, CRC press, 2013.
6. VigneshPrajapati, “Big Data Analytics with R and Hadoop”, Packet Publishing 2013.
