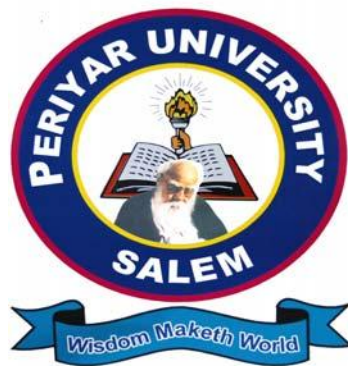


**PERIYAR UNIVERSITY**  
**PERIYAR PALKALAI NAGAR**  
**SALEM – 636 011**



**SYLLABUS FOR M. Sc COMPUTER SCIENCE**  
**FOR THE STUDENTS ADMITTED FROM THE YEAR**  
**2014 - 2015 ONWARDS**  
**PERIYAR INSTITUTE OF DISTANCE**  
**EDUCATION (PRIDE)**

**Regulations M. Sc – Computer Science  
with effect from the academic year 2014-15 onwards**

**1. OBJECTIVE OF THE PROGRAMME**

To Develop the Post Graduates in **Computer Science** with strong knowledge of theoretical Computer Science discipline who can be employed in Research and Development (R&D) units of Industries and Academic institutions.

**2. ELIGIBILITY FOR ADMISSION TO TWO YEAR M. Sc PROGRAMME:**

Candidates who have passed in any one of the following or equivalent are eligible to apply:

- (i) Bachelor's Degree in any programme with Mathematics at +2 level

**OR**

- (ii) Bachelor's Degree in any programme with Mathematics/Statistics as one of the subjects.

**3. DURATION OF THE PROGRAMME**

The duration for **Master of Science in COMPUTERSCIENCE** programme shall consist of two years.

**4. STRUCTURE OF M. Sc (Computer Science) PROGRAMME  
(FROM 2015-16 AND THEREAFTER)**

| Courses                                                          | Exam<br>Duration<br>(Hrs) | Marks |     |       |
|------------------------------------------------------------------|---------------------------|-------|-----|-------|
|                                                                  |                           | I. A  | E.E | Total |
| Year –I                                                          |                           |       |     |       |
| Core Course-1-15DPCS01- Discrete Mathematics                     | 3                         | 25    | 75  | 100   |
| Core Course-2-15DPCS02- Web Technology                           | 3                         | 25    | 75  | 100   |
| Core Course-3-15DPCS03- Design and Analysis of Algorithms        | 3                         | 25    | 75  | 100   |
| Core Course-4-15DPCS04- Advanced Database Management Systems     | 3                         | 25    | 75  | 100   |
| Core Course-5-15DPCS05- Advanced Computer Networks               | 3                         | 25    | 75  | 100   |
| Core Course 6- 15DPCS 06- Advanced Operating Systems             | 3                         | 25    | 75  | 100   |
| Core Course-7-15 DPCS07- Java Programming                        | 3                         | 25    | 75  | 100   |
| Elective Course 1<br>15DPCSZ --                                  | 3                         | 25    | 75  | 100   |
| Core Course-8-15DPCSP01- Lab – II Web Technology Lab             | 3                         | 40    | 60  | 100   |
| Core Course-9-15dPCSP02- Lab – III Java Programming Lab          | 3                         | 40    | 60  | 100   |
| Core Course-10-15DPCSP03 - Design and Analysis of Algorithms lab | 3                         | 40    | 60  | 100   |
|                                                                  |                           |       |     |       |
| Core Course-11-15DPCS08 Web Programming                          | 3                         | 25    | 75  | 100   |
| Core Course-12-15DPCS09 Software Engineering                     | 3                         | 25    | 75  | 100   |
| Core Course-13 -15DPCS10 Soft Computing                          | 3                         | 25    | 75  | 100   |
| Core Course-14-15DPCS11 Data science and Big data analytics      | 3                         | 25    | 75  | 100   |
| Core Course-15-15DPCS12 Mobile Computing                         | 3                         | 25    | 75  | 100   |
| Core Course-16-15DPCS13 Network Security                         | 3                         | 25    | 75  | 100   |
| Elective Course 2<br>15DPCSZ--                                   | 3                         | 25    | 75  | 100   |
| Elective Course 3<br>15DPCSZ--                                   | 3                         | 25    | 75  | 100   |
| Core Course-17-Web Programming Lab<br>15DPCSP04                  | 3                         | 40    | 60  | 100   |
| Core Course-18- Lab 15DPCSP04-Animation Lab                      |                           |       |     |       |

|                                              |   |    |     |      |
|----------------------------------------------|---|----|-----|------|
|                                              | 3 | 40 | 60  | 100  |
| Core Course-19<br>Dissertation and Viva Voce | 3 | 50 | 150 | 200  |
| Total Marks                                  |   |    |     | 2300 |

**Elective Course Code : 15DPCSZ- -**

**List of Electives**

**Elective -1**

|                 |                             |
|-----------------|-----------------------------|
| Course 15PCSZ01 | Advanced Computing          |
| Course 15PCSZ02 | Compiler Design             |
| Course 15PCSZ03 | Internetworking with TCP/IP |
| Course 15PCSZ04 | Software Project Management |

**Elective -2**

|                 |                             |
|-----------------|-----------------------------|
| Course 15PCSZ05 | XML and web services        |
| Course 15PCSZ06 | Client/Server Technology    |
| Course 15PCSZ07 | Embedded systems            |
| Course 15PCSZ08 | Data Mining and Warehousing |

**Elective -3**

|                 |                              |
|-----------------|------------------------------|
| Course 15PCSZ09 | System Analysis and Design   |
| Course 15PCSZ10 | Software Testing             |
| Course 15PCSZ11 | Enterprise Resource Planning |
| Course 15PCSZ12 | Digital Image Processing     |

## **5. EXAMINATIONS**

### **a) THEORY**

#### **EVALUATION OF INTERNAL ASSESSMENT**

|            |   |          |
|------------|---|----------|
| Test       | : | 15 Marks |
| Seminar    | : | 05 Marks |
| Assignment | : | 05 Marks |
|            |   | -----    |
| Total      | : | 25 Marks |
|            |   | -----    |

The Passing minimum shall be 50% out of 25 marks (13 marks)

### **b) EVALUATION OF EXTERNAL EXAMINATIONS**

#### **QUESTION PAPER PATTERN**

Time duration: 3 Hours

Max. Marks : 75

#### **PART- A: 5x5 = 25**

Answer all the questions  
Either or type for each unit

#### **PART- B: 5x10 = 50**

Answer all the questions  
Either or type for each unit

The Passing minimum shall be 50% out of 75 marks (38 marks)

### **c) PARACTICAL**

#### **EVALUATION OF INTERNAL ASSESSMENT**

|        |   |          |
|--------|---|----------|
| Test 1 | : | 15 Marks |
| Test 2 | : | 15 Marks |
| Record | : | 10 Marks |
|        |   | -----    |
| Total  | : | 40 Marks |
|        |   | -----    |

The Passing minimum shall be 50% out of 40 marks (20 Marks)

#### **EVALUATION OF EXTERNAL EXAMINATIONS**

Time duration: 3 Hours

Max. Marks : 60

## QUESTION PAPER PATTERN

1. One compulsory question from the given list of programmes : 30 Marks
2. One Either/OR type question from the given list of programmes: 30 Marks

### Distribution of Marks

|                       |            |
|-----------------------|------------|
| Problem Understanding | : 05 Marks |
| Program writing       | : 10 Marks |
| Debugging             | : 10 Marks |
| For Correct Results   | : 05 Marks |

### Dissertation and Project work

|                       |             |
|-----------------------|-------------|
| Evaluation (Internal) | : 50 Marks  |
| Evaluation (External) | : 150 Marks |

## 5. REGULATIONS OF PROJECT WORK

- a. Students should do their Project work in Company/ Institutions.
- b. The students should prepare three copies of the dissertation and submit the same to the study centre. one copy is to be retained in the centre library and one copy is to be submitted to the University (Director-Pride) and the student can hold one copy.
- c. A Sample format of the dissertation is enclosed in **Annexure-I**.
- d. Format of the **Title page** and **certificate** are enclosed in **AnnexureII**.

## 6. PASSING MINIMUM

The candidate shall be declared to have passed the examination if the candidate secures not less than 50% marks in the University examination in each paper / practical/Dissertation and Project work.

## 7. CLASSIFICATION OF SUCCESSFUL CANDIDATES

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class**. All other successful candidates shall be declared to have passed in **Second Class**. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

## **8. COMMENCEMENT OF THIS REGULATION**

These regulations shall take effect from the academic year 2015-16 onwards.

### **ANNEXURE I BONAFIDE CERTIFICATE COMPANY ATTENDANCE CERTIFICATE ACKNOWLEDGEMENT CONTENTS**

| Chapter No. | Title | Page.No |
|-------------|-------|---------|
|-------------|-------|---------|

#### **SYNOPSIS**

1. INTRODUCTION
    - 1.1 ORGANIZATION PROFILE
    - 1.2 SYSTEM CONFIGURATION
      - 1.1.1 HARDWARE CONFIGURATION
      - 1.1.2 SOFTWARE SPECIFICATION
  2. SYSTEM STUDY
    - 2.1 EXISTING SYSTEM
      - 2.1.1 DEMERITS
    - 2.2 PROPOSED SYSTEM
      - 2.2.1 SYSTEM STUDY
      - 2.2.2 FEATURES
  3. SYSTEM DESIGN AND DEVELOPMENT
    - 3.1 INPUT DESIGN/FORM DESIGN
    - 3.2 OUTPUT DESIGN/REPORT
    - 3.3 CODE DESIGN
    - 3.4 DATABASE DESIGN
    - 3.5 SYSTEM DEVELOPMENT
  4. TESTING AND IMPLEMENTATION
- CONCLUSION, BIBLIOGRAPHY
- A. DATA FLOW DIAGRAMS
  - B. TABLE STRUCTURES
  - C. SAMPLE INPUT/FORMS
  - D. SAMPLE OUTPUTS/REPORTS

\*Based on the Dissertation work, the above titles may be varied.

## **ANNEXURE II**

### **A. Format of the title page**

#### **TITLE OF THE DISSERTATION**

A Dissertation submitted in partial fulfillment of  
the requirements for the degree of

**Master of Science (Computer Science)**

to the Periyar University, Salem –11.

By

**STUDENT NAME**

**REG.NO.**



**CENTRE NAME**

**PERIYAR INSTITUTE OF DISTANCE EDUCATION (PRIDE)**

**PLACE with Pin Code**

**MONTH - YEAR**

## **B. Format of the Bonafide Certificate**

### **Name of the Internal Guide**

Designation

Department Name

College Address

---

### ***CERTIFICATE***

This is to certify that the dissertation entitled \_\_\_\_\_ submitted in partial fulfillment of the requirement for the degree of Master of Science in \_\_\_\_\_ to the PRIDE, Periyar University, Salem is a record of bonafide work carried out by \_\_\_\_\_ under my supervision and guidance and that no part of the dissertation has been submitted for the award of any degree or diploma.

Date:

*Signature of the guide*

Place:

---

Signature of the Co-Ordinator

**Examiner:**

## **FIRST YEAR**

**15DPCS01**

### **DISCRETE MATHEMATICS**

#### **Unit-I**

Mathematical Logic Connectives – Negation – Conjunction – Disjunction – Statement formulas and Truth tables: Well-formed formulas – Tautologies – Equivalence of formulas - Duality law – Normal Forms: Disjunction Normal Form – Conjunctive Normal Form – Principal Disjunctive Normal Form – Principal conjunctive Normal Form.

#### **Unit-II**

Theory of inference Validity using truth table – The Predicate Calculus – Predicates, Statement function, variables and Quantifiers – Inference Theory of predicate calculus: Valid formulae and Equivalence.

#### **Unit-III**

Relations and functions Relation and Ordering – Relation – Properties of Binary relation in a set – Functions – Definition and Introduction – Composition of functions – Inverse functions – Binary and n-ary operations – Hashing functions – Natural Numbers – Peano Axioms and Mathematical induction - Cardinality.

#### **Unit-IV**

Lattice and Boolean algebra Lattices and Partially Ordered Sets – Definition and Example – Some Properties of Lattices – Lattices of Algebra system – Sub lattices – Direct Product and Homomorphism – Boolean Algebra – Definition and Example – Sub Algebra – Direct Product and Homomorphism – Boolean function – Boolean forms and Free Boolean Algebra – Values of Boolean Expression and Boolean Function.

#### **Unit-V**

Languages and finite state machines Grammars and Languages: Discussion of Grammars – Formal Definition of Language – Finite State Machines – Introductory Sequential Circuit – Equivalence – of Finite State Machines – Finite State Acceptors and Regular Grammars.

#### **Text Book:**

1. J.P.Trembley and R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, New Delhi, 1997. Sections: 1.4.1,1.5.1, 1.5.2, 1.6.1, 3.3.1 -3.3.2, 2.3.1, 2.3.2, 2.4.1-2.4.4, 2.4.6, 2.5.1, 2.5.2, 4.1.1, 4.1.4, 4.2.1, 4.2.2, 4.3.1, 6.1.1, 4.6.1, 4.6.2.

**Reference Books:**

1. James C.Abbott, Sets, Lattices and Boolean algebra, Allyn and Bacon, inc. Boston. 1969.
2. J.E.Hopcroft and J.D.Ullman, Formal Languages and Their Relations to Automata, Addison – Wesley Pub. Comp. Reading Mass, 1969.
3. H.G.Flegg, Boolean algebra and Its Applications, John Wiley and Sons Inc.New York, 1974

**15DPCS02****WEB TECHNOLOGY****UNIT – I: Introduction HTML & XHTML**

A Brief Introduction to the Internet – The World Wide Web – Web Browsers – Web Servers, Uniform Resource Locator – Multipurpose Internet Mail Extension – The Hypertext Transfer Protocol – Origin and Evaluation of HTML & XHTML, Standard XHTML document structure – Basic text markup – Images – Hypertext link – Lists – Tables – Forms – Frames – Syntactic differences between HTML & XHTML.

**UNIT – II: Cascading Style Sheet (CSS) & Java Script**

Cascading Style Sheet(CSS) – Overview of Java Script – Object Orientation & Java Script – Primitives, Operation and Expressions – Screen Output and Keyboard Input – Control Statements – Object Creation Modifications, Arrays – Function Construction – Pattern matching using Regular expression.

**UNIT – III: Dynamic Documents using Java Script**

Java Script Execution Environment – Document Object Model(DOM) – Element Access in Java Script – Events and Events Handling – Handling Events from Body Elements, Button Elements, Textbox and Password Elements – DOM Tree traversal and Modification – Positioning Elements – Moving Elements – Elements Visibility – Changing colors and fonts – Dynamic Content – Stacking Elements – Locating the Mouse Cursor, Reacting to a Mouse Click – Dragging and Dropping Elements.

**UNIT – IV: XML & Web services**

Introduction – XML Document Structure – Document Type Definition – Namespace – XML Schemas – Displaying Raw XML Document – Displaying XML Document with CSS – XSLT Style Sheet – XML Processors– Web services

## **UNIT – V: PHP & Ajax**

Overview of PHP – General Syntactic characteristics – Primitives, Operation and Exception – Output – Control Statement – Arrays – Functions – Pattern Matching – Form Handling – Files – Cookies, Session Tracking – MySQL database system – Database access with PHP & MySQL. Overview of Ajax – The Basics of Ajax- Rails with Ajax.

### **Text Book**

1. Robert W. Sebesta, Programming with World Wide Web, 4<sup>th</sup> Edition, Pearson Education, 2008, Chapter 1-7, 11,13,4,13.6,16

### **Reference Books**

1. Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, “Internet and World Wide Web – How To Program”, Fifth Edition, Pearson Education, 2011.
2. Achyut S Godbole and Atul Kahate, “Web Technologies”, Second Edition, Tata McGraw Hill, 2012.
3. Thomas A Powell, Fritz Schneider, “JavaScript: The Complete Reference”, Third Edition, Tata McGraw Hill, 2013.
4. David Flanagan, “JavaScript: The Definitive Guide, Sixth Edition”, O’Reilly Media, 2011
5. Steven Holzner, “The Complete Reference – PHP”, Tata McGraw Hill, 2008
6. Mike Mcgrath, “PHP & MySQL in easy Steps”, Tata McGraw Hill, 2012.

## **15DPCS03                      DESIGN AND ANALYSIS OF ALGORITHMS**

### **Unit-I**

Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic Notations and Basic Efficiency Classes- Mathematical analysis of non-recursive Algorithms – Non-recursive solution to the Matrix Multiplication - Mathematical analysis of recursive algorithms – Recursive solution to the Tower of Hanoi Puzzle.

### **Unit-II**

Divide and conquer Technique – Multiplication of large integers – Strassen's matrix multiplication – Closest pair and Convex Hull Problems – Greedy method – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm.

### **Unit-III**

Dynamic Programming - Computing a binomial coefficient – Warshall's and Floyd's Algorithm – Application of Warshall's Algorithm to the digraph – Floyd's Algorithm for the all pairs shortest paths Problem - The Knapsack problem and Memory function.

### **Unit-IV**

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

### **Unit-V**

P, NP and NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.

### **Text Book**

1. AnanyLevitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2009. (Chapters 1.1-1.3, 2.1, 2.2, 2.3, 2.4, 4.5, 4.6, 8.2, 8.4, 9.1-9.3, 11.3, 12.1,12.2, 12.3)

### **Reference Books**

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms", Prentice Hall 1990.
2. S.K. Basu, "Design methods and Analysis of Algorithms", Prentice Hall, 2005.

## **15DPCS04**

## **ADVANCED DATABASE MANAGEMENT SYSTEM**

### **Unit-I**

**Advanced SQL:** Accessing SQL From a Programming Language – Functions and procedures – Triggers – Recursive Queries – Advanced Aggregation Features – OLAP –

Formal Relational Query Languages: The Relational Algebra – The Tuple Relational Calculus – The Domain Relational Calculus.DDL,Normalization

## Unit-II

**Object-Database Systems:** Structured Data Types – Operations on Structured Data – Encapsulation and ADTs – Inheritance – Objects, aIDs, and Reference Types – Database Design for ORDBMS – ORDBMS Implementation Challenges – OODBMS – Comparing RDBMS, OODBMS, and ORDBMS – **Advanced Database Management System:** Motivation – Spatial and Geographic Data – Multimedia Databases – Mobility and Personal databases.

## Unit-III

**Parallel Databases:** Introduction – I/O Parallelism – Interquery Parallelism – Intraquery Parallelism – Intraoperation parallelism – Interoperation Parallelism – Query Optimization –Design of parallel systems – **Distributed Databases:** Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions – Commit Protocols –Concurrency Control in Distributed – Availability – Distributed Query Processing.

## Unit-IV

**XML:** Motivation – Structure of XML Data – XML Document Schema – Querying and Transformation – Application Program Interfaces to XML – Storage of XML Data – XML Applications. **Advanced Application Development:** Performance Tuning – Performance Benchmarks – Other Issues in Application Development – Standardization.

## Unit -V

**Transaction processing and concurrency control:**Transaction Concept – A Simple Transaction Model – Storage Structure – Transaction Atomicity and Durability – Transaction Isolation – Serializability – **ConcurrencyControl:** Lock-Based Protocols – Deadlock Handling – Multiple Granularity – Timestamp-Based Protocols – Validation-Based Protocols.

## Text Books:

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan,“Database System Concepts”, Sixth Edition, McGraw-Hill, 2006. Chapters: (5, 6, 14.1-14.6, 15.1-15.5,18.1-18.8, 19, 23, 24, 25)
2. Ramakrishnan, Gehrke, “Database Management Systems”, Third Edition, McGraw-Hill, 2003. Chapter: 23

**Reference Books:**

1. Elmasri, Navathe, “Fundamentals of Database Systems”, Sixth Edition, Pearson Education, 2011.
2. Stefano Ceri, Giuseppe Pelagatti, “Distributed Databases principles and systems”, TMH- 2008.

**15DPCS05****Advanced Computer Networks****Unit 1**

Introduction -Data Communications, Networks, The Internet, Protocols & Standards, Layered Tasks, The OSI model, Layers in OSI model, TCP/IP Protocol suite, Addressing, Physical Layer - Analog & Digital Signals, Transmission Impairment, Data Rate limits, Performance, Transmission Media – Guided Media, Unguided Media.

**Unit 2**

Data Link Layer - Error Detection & Correction: Introduction, Block coding, Linear block codes, Cyclic codes, Checksum, Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy channels, Connecting Devices, Backbone Networks, Satellite Networks.

**Unit 3**

Network Layer – IPV4 Address, IPV6 Address, Address Mapping, Error Reporting, Delivery, Forwarding, Unicast Routing Protocol, Multicast Routing Protocol.

**Unit 4**

Transport Layer- Process to Process Delivery, UDP, TCP, SCTP, Data Traffic, Congestion, Congestion Control, Quality of Services, Techniques to improve QoS, Integrated Services.

**Unit 5**

Application Layer – Domain Name System, Remote Login, Electronic Mail and File Transfer, WWW and HTTP. Security – Cryptography, Symmetric Key

Cryptography, Asymmetric Key Cryptography, RSA, IPSecurity, SSL/TLS, Firewalls.

**Text Books:**

1. Behrouz A. Forouzan, Data Communication and Networking, Fourth Edition Tata McGraw-Hill, 2007.

**Reference Books:**

1. Uyless Black, Computer Networks, Second Edition, PHI, 2005
2. B.A. Forouzan, "Data Communication and Networking", Third Edition, Tata McGraw Hill, 2004.

**15DPCS06**

**ADVANCED OPERATING SYSTEM**

**Unit-I**

**Operating System Structure:** Operating-System Services – User and Operating-System Interface – System Calls – Types of System Calls – System Programs – Operating-System Design and Implementation – Operating-System Structure – Operating-System Debugging – Operating-System Generation – System Boot – **Multiprocessor Operating Systems:** Introduction – Structures of Multiprocessor Operating Systems – Operating System Design.

**Unit-II**

**Distributed Resource Management:** Introduction – Architecture – Mechanisms for Building Distributed File Systems – Design Issues – **Distributed Shared Memory:** Introduction – Architecture and Motivation – Algorithms for Implementing DSM – Memory Coherence – Coherence Protocols – Design Issues.

**Unit-III**

**Process Management: Process** – Process Concept – Process Scheduling – Operations on Processes – Interprocess Communication – **Process Synchronization:** Background – The Critical-Section Problem – Peterson's Solution – Synchronization Hardware – Mutex Locks – Semaphores – **Deadlocks:** System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

**Unit-IV**

**Memory Management: Main Memory:** Background – Swapping – Contiguous Memory Allocation – Segmentation – Paging – Structure of the Page Table – **Virtual**

**Memory:** Background – Demand Paging – Copy-on-Write – Page Replacement – Allocation of Frames – Thrashing – Memory-Mapped Files – Allocating Kernel Memory.

## **Unit-V**

**Virtual Machines:** Overview – History – Benefits and Features – Building Blocks – Types of Virtual Machines and Their Implementations – Virtualization and Operating-System Components – **Distributed Systems:** Advantages of Distributed Systems – Types of Network-based Operating Systems – Network Structure – Communication Structure – Communication Protocols – Robustness.

### **Text Book:**

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, “Operating System Concepts”, Ninth Edition, John Wiley & Sons, Inc., 2013. Chapters (2, 3 (3.1-3.4), 5 (5.1-5.6), 7 (7.1-7.7), 8 (8.1-8.6), 9 (9.1-9.8), 16 (16.1-16.6), 17 (17.1-17.5, 17.7))
2. MukeshSinghal, Niranjana G. Shivaratri, “Advanced Concepts in Operating Systems: Distributed, Database, and Multiprocessor Operating Systems”, Tata McGraw-Hill, 2008. Chapters (17 (17.1-17.3), 9 (9.1-9.4), 10 (10.1-10.6))

### **Reference Books:**

1. Andrew S. Tanenbaum, “Modern Operating Systems”, 2<sup>nd</sup> Edition, Prentice-Hall of India, 2001.
2. William Stallings, “Operating Systems – Operating System: Internals and Design Principles”, 4<sup>th</sup> Edition, Prentice Hall, 2005.

## **15DPCS07**

## **JAVA PROGRAMMING**

### **UNIT-I**

**An Overview of Java:** Object Oriented Programming-Lexical Issues- class Libraries. **Data Types, Variables, and Arrays:** Primitive Types-Literals-Variables-Type Conversion and Casting- Arrays. **Operators:** Arithmetic-Bitwise – Relational - Boolean Logical- Assignment – Conditional - operator Precedence. **Control Statements:** Selection statements-Iteration Statements-Jump Statements. **Classes and Methods:** Fundamentals- Declaring objects- Methods- Constructors-Garbage Collection-Overloading Methods-Recursion – Access Control- Nested and Inner Classes-Command Line Arguments.

### **Unit-II**

**Inheritance:** Basics- Super Class- Method overriding- Abstract Class. **Packages and Interfaces:** Packages-Access Protection-Importing Packages- Interfaces-Default Interface Methods. **Exception Handling:** Fundamentals- types- Uncaught Exceptions- Try and Catch- throw-throws-finally-built-in exceptions. **Multi-threaded**

**programming:** Thread Model-Creating a Thread- Thread Priorities-Synchronization- Interthread Communication.

### Unit-III

**String Handling:** Constructors- Length - Special String Operations - Character Extraction - String Comparision - Modifying a String - String Buffer. **Input/Output:** The I/O Classes and Interfaces – File - I/O Exceptions - Byte Streams - Character Steams – Serialization. **The Applet Class:** Basics-Architecture - Applet Skeleton - Display methods - Status Window - Passing Parameters. **Event Handling:** Event Model – Classes - KeyEvent Class- Event Listner Interfaces.

### Unit-IV

**AWT:** Window Fundamentals - Working with Frame Windows – Graphics - Working with Color - Working with fonts - Controls – Labels- Buttons- Check Box - Choice Controls- Lists- Scroll Bars- Text Field- Text Area - Layout Menubars and Menus. **Java Beans:** Advantages - Introspection – properties - Java Beans API. **Servlets:** Life Cycle-Simple Servlet-Servlet API-Packages-Cookies-session tracking.

### Unit-V.

**Using Relational Databases:** Introduction- JDBC Drivers for RDBM Systems - Using Java.sql API - Using Javax.sql API - Connection Pooling. **Network Programming:** Introduction- Working with URLs-Working with Sockets- Remote Method Invocation.

### TEXT BOOK

- [1] Herbert Schildt, “The Complete Reference Java J2SE”, 9th ed., TMH Publishing Company Ltd, New Delhi, 2014. Chapter: 2-11, 16, 22, 23,24,25,26,37,38
- [2] Joe Wiggles worth and Paula McMillan, “Java Programming Advanced Topics”, 3rd ed., TMH, 2009. Chapter: 9, 11.

### ReferencES

1. John Dean, Raymond Dean, “ Introduction to Programming with JAVA – A Problem Solving Aproach”, Tata McGrawHil, 2012
2. Ralph Bravaco, Shai Simonson, “Java Programming : From the Ground Up”, Tata McGraw Hil Edit on, 2012
3. Herbert Schildt, Dale Skrien, “Java Fundamentals – A Comprehensive Introduction”, Tata McGrawHil, 2013.

**15DPCSP01****WEB TECHNOLOGY LAB**

1. Design Online Book Store using List and Frames
2. Design a Time Table using Table and Images
3. Embedding Video and Audio Files in HTML
4. Design Event Web Page using Style Sheet (Font/Text, Color and Border Properties)
5. Write an XML document to display your bio-data. Write an XSL style sheet and attach it to the XML document. Validate the document using DTD or XSD.
6. Write an Ajax Program to get the User name suggestions in Registration Form
7. Web page using XML with Java Script
8. Design Image Map using Java Script
9. Registration Form Validation using Java Script
10. Simple Game using Event handling in Java Script
11. History of web pages using DOM
12. String Functions in PHP
13. Accessing the Student Exam Result Database (MySQL) using PHP
14. Develop a web application for Airline Reservation System using PHP & AJAX.
15. Online Shopping cart with Table operations (Insert, Select, Delete, Update) using PHP

**15DPCSP02****JAVA PROGRAMMING LAB**

Use JAVA Programming Language to implement the following:

1. Concept of different types of inheritance.
2. Concept of Interface.
3. Concept of Package.
4. To handle mouse events.
5. To handle keyword events
6. To create applets incorporating the following Features:
  - a. Create a color palette with matrix of buttons
  - b. Set background and foreground of the control text area by selecting a color from color palette.
  - c. In order to select Foreground or background use check box control as radio buttons
  - d. To set background images
7. Use GridLayout to design a calculator and simulate the functions of simple calculator.
8. To Create Input output and Random files
9. To develop chat application with datagram sockets and datagram packets.
10. To invoke servlet from HTML forms.
11. To invoke servlet from Applets.
12. To invoke servlet from JSP.

13. Simple client/server application.
14. JDBC to interact with database.
15. To create multiple chat applications using TCP packets.

### **15DPCSP03**

### **DESIGN AND ANALYSIS OF ALGORITHMS LAB**

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Strassen's matrix multiplication using divide and conquer method.
3. Solve the knapsack problem using Dynamic Programming.
4. Construct a minimum spanning tree using greedy method.
5. Perform Warshall's Algorithm using Dynamic Programming.
6. Solve Dijkstra's Algorithm using Greedy Technique.
7. Solve Subset Sum problem using Backtracking
8. Implement the 8-Queens Problem using backtracking.
9. Implement knapsack problem using backtracking.
10. Find the solution of traveling salesperson problem using branch and bound technique.

## **SCOND YEAR**

**15DPCS08**

### **WEB PROGRAMMING**

#### **Unit – I**

Introduction to .NET - .NET Defined – The .NET Framework - Visual Basic .NET. VB6 and VB .NET Differences – Data Type Changes- Arrays- Operators- User Defined Types- Null Values, Variables- Procedures- Properties- Control Flow- Form-based Application Changes- Application Types- Data Access- Object Oriented Programming and VB .NET – Encapsulation- Inheritance, Polymorphism - Data Types, Variables, and Operators – Arrays –Conditional Logic.

#### **Unit –II**

Procedures - Dialog Boxes – Introduction to Dialog Boxes- File IO and System Objects –Directory object - Error Handling –Namespaces –Classes and Objects – Multithreading.

#### **Unit –III**

Data Access – Introduction to Data Access in .NET - ADO.NET - Data Access in Visual Studio .NET – Visual Studio .NET Database Tools, Visual Studio .NET and ADO.NET - Visual Studio .NET and XML - Manipulating XML in Code - Windows Forms – Introduction to System.Windows.Form - Controls – Specific Controls – Base Controls, Derived Controls, Display Controls, Dialog Controls, Miscellaneous Controls.

#### **Unit –IV**

“Visual” Inheritance – Irregular Forms – Other Namespaces and Objects in the Catalog –Introduction to Web Development - Introduction to ASP.NET - Page Framework – HTML Server Controls.

#### **Unit –V**

Web Controls – Validation Controls –User Controls –Events – Cascading Style Sheets –State Management – ASP.NET Applications – Creating Web Application, Deleting an Application, global.asax, Understanding web.config.

#### **Text Book:**

1. Bill Evjen, Jason Beres, et al, “Visual Basic .NET Programming”, Wiley India Publication,2002 – Chapters 1-15,21-41.

#### **Reference Books:**

1. David Chappell, Understanding .NET , Pearson education, 2002

2. David.S.Platt, Introducing Microsoft .Net , PHI, 2003.
3. G.AndrwDuthie , Microsoft ASP .NET Programming with Microsoft Visual C# .NET step by step , PHI ,2003.
4. George Shepherd, Microsoft ASP .NET 3.5 , PHI, New Delhi, 2008.
5. Steven Holzner, Visual Basic .NET Programming Black Book ,Dreamtech Press.
6. EvangelosPetroutsos, Mastering Visual Basic .NET ,BPB Publications.
7. Barbara Doyle, Programming in C#, Cengage Learning publications –I Edition – 2008
8. Kathleen Kalata , Web Applications using ASP .NET 2.0 - Cengage Learning publications.

## 15DPCS09

## SOFTWARE ENGINEERING

### UNIT – I :

**Socio-technical systems :** Emergent system properties – System Engineering – Organizations, People and Computer Systems – Legacy Systems. **Software Processes:** Software process models – Process iteration – Process activities – The Rational Unified Process – Computer Aided Software Engineering. **Project Management:** Management activities – Project Planning – Project scheduling – Risk management.

### UNIT-II :

**Software Requirements:** Functional and non-functional requirements- User requirements- System requirements – Interface specification – The Software requirements- Interface specification –The software requirements document. **Requirements Engineering Process:** Feasibility studies – Requirements elicitation and analysis – Requirements validation – Requirement management. **System Models:** Context Models – Behavioral Models – Data Models – Object Models - Structured Methods.

### UNIT-III:

**Design:** Architectural Design decisions – System organization – Modular decomposition styles – Control styles – Reference architectures. **Distributed Systems Architectures:** Multiprocessor architectures – Client-Server Architectures – Distributed object architectures – Inter-organisational distributed computing. **Application Architectures:** Data processing systems – Transaction processing systems – Event processing systems – Language processing systems. **User Interface Design:** Design issues - The UI design process- User Analysis – User Interface prototyping – Interface evaluation.

#### **UNIT-IV:**

**Rapid Software Development:** Agile methods – Extreme programming – Rapid application development – Software prototyping. **Component-based Software Engineering:** Components and Component Models – The CBSE process – Component composition. **Software Evolution:** Program evolution dynamics – Software maintenance – Evolution processes – Legacy system evolution.

#### **UNIT-V :**

**Verification and Validation:** Planning verification and validation – Software inspections – Automated static analysis – Verification and formal methods. **Software Testing:** System Testing – Component Testing – Test case design – Test automation. **Software Cost Estimation:** Software productivity – Estimation techniques – Algorithmic cost modeling – Project duration and staffing. **Configuration Management :** System building – CASE tools for configuration management.

#### **TEXT BOOK:**

Ian Sommerville, “Software Engineering”, Seventh Edition, Pearson Education, 2005.

#### **REFERENCE BOOKS:**

1. Richard Fairly, “Software Engineering Concepts”, TMGH, 1997
2. Roger S.Pressman, “Software Engineering a Practioner’s Approach”, Fifth Edition, McGraw- Hill Higher Education.
3. Rajib Mall, “Fundamentals of Software Engineering”, PHI, Second Edition

#### **15DPCS10**

#### **SOFT COMPUTING**

##### **Unit-I:**

Fundamentals of Neural Networks Basic Concepts of Neural Network-Model of an Artificial Neuron - Neural Network Architectures - characteristics of Neural Networks - Learning Methods-Taxonomy-History of Neural Network - Early Neural Network Architectures.

##### **Unit-II:**

Back propagation Networks Architecture of Backpropagation Network - Backpropagation Learning-Illustrations applications - Effect of Tuning Parameters of the Backpropagation Neural Network-Selection of various parameters in Backpropagation Neural Network-Variations of Standard Backpropagation algorithms.

**Unit-III:**

Fuzzy Sets and Systems Fuzzy Sets - Fuzzy Relations-Fuzzy Logic-Fuzzy Rule based system-Defuzzification Methods-Applications. Unit-IV: Genetic Algorithms Genetic Algorithms: History – Basic concepts – Creation of offsprings – Working principle – Encoding – Fitness function – Reproduction.

**Unit-V:**

Genetic Modelling Inheritance operators – Cross over – Inversion and deletion – Mutation operator – Bitwise operators – Bitwise operators used in GA - Generation cycle – Convergence of Genetic algorithm- Applications.

**TEXT BOOK:**

1.Rajasekaran. S and VijayalakshmiPai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, 2008 (Chapters: 2.1, 2.3-2.9, 3.1-3.7, 6.3, 6.5, 7.3-7.6, 8.1-8.7, 9.1-9.9)

**REFERENCE BOOKS:**

1. Fakhreddine O. Karray, Clarence De Silva, Soft Computing and Intelligent Systems Design, Pearson, 2009.
2. Sivanandam. S. N and Deepa S. N, Principles of Soft Computing, Wiley India, 2008.
3. Randy L. Haupt, Sue Ellen Haupt, Practical Genetic Algorithms, Second Edition, Wiley Interscience, A John Wiley & Sons, Inc., Publication. (Chapters 1,2& 6.1).

**15DPCS11****DATA SCIENCE AND BIG DATA ANALYTICS****Unit-I:** Introductions of Big Data Analytics

Introduction to Big Data Analytics: Big Data – Basic Nomenclature – Data Analytics, Analytics Process Model – Data collection, Sampling and Preprocessing: Type of data source – Sampling – Types of data Elements – Visual Data Exploration and Exploration Statistical Analysis – Missing values – Outlier detection and Treatment – Standardizing data – Categorization.

**Unit-II:** Advanced Analytics and Statistical Modeling Theory

Predictive Analytics: Target Definition – Linear Regression – Logistic Regression – Decision Tree – Support Vector machine – Neural Network – Multiclass classification Techniques – Evaluating. Descriptive Analytics: K-means clustering - Association rule – Sequence Rules – Segmentation.

**Unit-III:** Basic Data Analytic Methods Using R and Hadoop

R Studio - Understanding the features of R language: R packages - Data operations using R – Data modeling in R. Hadoop: Different Hadoop models – Features of Hadoop: Hadoop Distributed File System (HDFS) – MapReduce. Plot architecture of HDFS and MapReduce

#### **Unit-IV:HadoopMapReduce Programs**

The basics of MapReduce Programs - Stages of HadoopMapReduce data processing - Limitations of MapReduce - The HadoopMapReduce fundamentals - HadoopMapReduce terminologies. Intergrating R and Hadoop: Introduction of RHIPE - The Architecture of RHIPE - Introduction of RHadoop

#### **Unit-V: Learning Data Analytics with R and Hadoop**

Exploring web pages categorization - Computing the frequency of stock market change - Predicting the sale price of blue book for bulldozers - case study. Importing and Exporting Data from Various Database's: Learning about data files as database - Understanding MySQL - Understanding Excel - Understanding MongoDB - Understanding SQLite.

#### **TEXT BOOK**

1. Bart Baesens, Analytics in a Big Data World: The Essential Guide to Data Science and its Applications, ISBN: 978-1-118-89270-1, 2014. (Chapters 1,2,3,4)
2. VigneshPrajapati, Big Data Analytics with R and Hadoop, 2013. (Chapter: 1,2,3,4,5,7)

### **15DPCS12**

### **MOBILE COMPUTING**

#### **Unit-I**

Introduction - Applications - History of wireless communication - A Simplified reference model - Wireless transmission - Frequencies for radio transmission - Regulations - Signals -Antennas - Signal propagation: Path loss of radio signals - Additional signal propagation effects - Multi-path propagation - Multiplexing - Modulation

Chapters: 1, 2.1 to 2.6

#### **Unit-II**

Spread spectrum - Direct sequence spread spectrum - Frequency hopping spread spectrum - Cellular systems. Medium access control: Hidden and exposed terminals - Near and far terminals - SDMA, FDMA, TDMA, Fixed TDM, Classical Aloha, slotted Aloha, Carrier sense multiple access - Reservation TDMA - Multiple access with collision avoidance - Polling - CDMA - Spread Aloha multiple access.

Chapters: 3.1 to 3.3, 3.4.1 to 3.4.4, 3.4.7 to 3.4.9, 3.5.1

#### **Unit-III**

GSM - Mobile services - System architecture - Radio interface - Protocols - Localization and calling - Handover - Security - New Data services. UMTS and IMT-2000 - Satellite Systems: Applications - Basics - Routing - Localization - Handover. Chapters: 3.6, 4.1.1 to 4.1.8, 4.4, 5.2 to 5.6

#### **Unit-IV**

Wireless LAN: Infra red vs. radio transmission – Infrastructure and ad-hoc network – IEEE 802.11 – System architecture – Protocol architecture – Physics layer – Medium access control layer – MAC management – Blue tooth. Mobile network layer: Mobile IP: Goals, assumptions and requirements – entities and terminology – packet delivery – Agent discovery – Registration – Tunneling and encapsulation Recent technologies

Chapters: 7.1 to 7.3.5, 7.5, 8.1.1 to 8.1.6

#### **Unit-V**

WAP: Architecture – wireless datagram Protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Mobile ad-hoc networks – MANET Characteristics – Classification of MANETs, Routing of MANETs, Proactive Routing Protocol - DSDV, Reactive Routing Protocols – DSR, AODV. Chapter 10.3.1 to 10.3.6 (Text Book 2- 6.1, 6.2, 6.4, 6.5, 6.6)

#### **Text Book:**

1. Jochen Schiller, “Mobile Communications”, Second Edition, Pearson Education, 2009.
2. KumKumGarg, “Mobile Computing Theory and Practice”, Pearson Education, 2014.

#### **References Books:**

1. Rifaat A. Dayen “Mobile Data & Wireless LAN Technologies”, Prentice Hall, 1997.
2. Steve Mann and Scoot Schibli, “The Wireless Application Protocol”, John Wiley & inc., 2000.

### **15DPCS13**

### **NETWORK SECURITY**

#### **UNIT-I:**

Services ,Mechanisms and Attacks – Classical Encryption Techniques – Confidentiality using Symmetric Encryption.

#### **UNIT-II:**

Introduction to Number theory – Public-key Cryptography and RSA – Key Management :Diffie – Hellman Key Exchange – Elliptic Curve Cryptography.

#### **UNIT-III:**

Message Authentication and Hash Functions – Digital Signatures and Authentication Protocols..

**UNIT-IV:**

Authentication Applications – Electronic Mail Security - .IP Security.

**UNIT-V:**

Web Security.- Intruders – Malicious – Firewalls.

**TEXT BOOK:**

1. William Stallings, Cryptography and Network Security - principles and practices , Prentice –Hall of India, 2008, 3<sup>rd</sup> Edition.

**REFERENCE BOOKS:**

1. Neal Krawetz, Introduction Network Security, India Edition, Thomson Delmar Learning. 2007.
2. V.K.Pachghare, Cryptography and Information Security, PHI Learning Private Limited 2009.

**15DPCSP04****Web Programming Lab**

A. Implement the following using VB.NET

1. Creating and using Variables, Arrays and Structure
2. Creating and using Procedures
3. Using Decision Structures
  - a. Checking User Input
  - b. Confirming Application Close
4. Implementing Structured Exception Handling
5. Creating Menus , Status Bars and Toolbars
6. Create and open a connection to a database using ADO.NET
7. Create, read, update, and delete records in a database using ADO.NET

B. Implement the following using ASP.NET

1. Create a master page to serve as a template for the Web site's pages.
2. Create a admin page with an editable master-detail view for browsing, inserting, updating, and deleting records.
3. Create a simple web site
4. Create and open a connection to a database using ADO.NET
5. Create, read, update, and delete records in a database using ADO.NET
6. Use SqlDataSource to populate a DropDownList and GridView
7. Use ObjectDataSource to Populate a GridView
8. Create a feedback form.

**15DPCSP05****ANIMATION LAB****Photoshop**

1. To design the text with image and adding the special effects on the respected text and image.
2. To develop the any natural picture

**Premiere**

3. To design the text with image and adding the special effects on the respected text and image.
4. To develop the any new model of picture

**Illustrator**

5. To design the text with image and adding the special effects on the respected text and image.
6. To develop the dancing text and image.

**Flash**

7. To design the text with image and adding the special effects on the respected text and image.
8. To develop the any natural picture Director
9. To design the text with image and adding the special effects on the respected text and image.
10. To develop the animation of alphabet with relevant picture
11. To develop the any natural picture

**Dream weaver**

12. To design the text with image and adding the special effects on the respected text and image.
13. To be develop the any picture

**Maya**

14. To Create a Clip for a Character of the human Skeleton Components.
15. To develop the Rendering (The Real World) animations.
16. To develop the Maya Dynamics.

**ELECTIVE-I****15DPCSZ01****ADVANCED COMPUTING****Unit-I:**

Introduction – Grid Computing Grid Computing - The data Centre, the Grid and the distributed/High performance computing – Cluster computing and Grid computing – Meta computing – Scientific, business and E-Governance Grids, web services and Grid computing.

**Unit-II:**

Grid Computing Architecture Technologies and architecture for Grid computing – Web services and the Service oriented Architecture(SOA)- OGSA for Resource distribution – Stateful web services in OGSA – Web services Resource Framework(WSRF) – Resource approach to stateful services – WSRF specification – The Grid and the databases.

### **Unit-III:**

Cluster Computing Approaches to parallel computing – How to achieve low cost parallel computing through clusters – Definition and architecture of a cluster – Cluster Middleware : An Introduction – Levels and layers of single system Image(SSl) – Cluster middleware design objectives – Resource Management and scheduling – Cluster programming environment and tools.

### **Unit-IV:**

Fundamentals of Cloud Computing Fundamentals – Short history of cloud computing – Cloud Architecture – Cloud Storage – Cloud Service – Pros and Cons of cloud computing – Benefits from cloud computing.

### **Unit-V:**

Cloud Services Need for Web-Based Application – The cloud Service Development – Cloud Service Development Types – Cloud Service development tools.

### **Text Books:**

1. C.S.R Prabhu, Grid and Cluster computing, Prentice Hall of India,2008. (Units I , II & III)
2. Michael Miller, “Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online”, Que, 2008. (Units IV & V)

## **References Books:**

1. Fran Berman, Geoffrey Fox, J.G. Anthony Hey, "Grid Computing : Making the Global Infrastructure a reality", John Wiley & sons, 2003.
2. Joshy Joseph & Craig Fellenstein, "Grid Computing", Pearson Education, 2004.
3. Hmar Abbas, "Grid Computing: A Practical Guide to technology and Application Charles River media, 2003.

## **15DPCSZ02**

## **COMPILER DESIGN**

### **Unit-I**

Introduction to compilers: Compilers and Translators – Structure of a Compiler – Lexical Analysis – Syntax Analysis – Intermediate code generation – Optimization – Code generation – Book keeping – Error handling – Compiler Writing tools – Lexical Analysis: The role of the Lexical analysis – A simple approach to the design of lexical analyzers – Regular expressions – Implementation of a lexical analyzer.

### **Unit-II**

Basic Parsing techniques: Derivations and parse trees – Parsers – shift reduce parsing – Operator Precedence Parsing – Top down parsing – Predictive parsing – Automatic construction of efficient parsers: LR parsers – The Canonical collection of LR (0) items – Constructing SLR parsing tables – Constructing canonical LR parsing tables – Constructing LALR parsing tables – Using ambiguous grammars – An automatic parser generator – Implementation of LR parsing tables – Constructing LALR set of items.

### **Unit-III**

Syntax- Directed translation: Syntax-directed translation schemes – Implementation of syntax-directed translators – Intermediate code – Postfix notation – Three address code, quadruples, and triples- Postfix translations.

### **Unit-IV**

Symbol tables: The contents of a symbol table – Data structures for symbol tables – Representing scope information – Error detection and recovery: Errors – Lexical-Phase errors – Syntactic –phase errors – Semantic errors.

### **Unit-V**

Introduction to Code optimization: The principal sources of optimization – Loop optimization – The DAG representation of basic blocks – Code generation: Object programs – Problems in code generation – A simple code generator – Peephole optimization.

### **Text Book:**

1. Alfred V. Aho and Jeffrey D. Ullman, “Principles of Compiler Design”, Narosa Publishing House, 2002. Chapters: 1.1, 1.3, 1.4, 1.5 to 1.11, 3.2, 3.3, 3.8, 4.2, 5.6, 7.1 to 7.4, 7.6, 7.10, 9, 11, 12.1 to 12.3, 15.1, 15.2, 15.4, 15.7.

### **Reference Books:**

1. Alfred V. Aho, Ravi Sethi, Jeffery D. Ullman, "Compilers", Narosa Publishing House, 2002.
2. Jean-Paul Tremblay and Paul G. Soreson, "Compilers Writing", McGraw Hill International Editions, 2000.

## **15DPCSZ03                    INTERNETWORKING WITH TCP/IP**

### **UNIT 1: INTRODUCTION**

Internetworking concepts and architectural model –classful Internet address CIDR-Subnetting and Supernetting –ARP–RARP–IP –IP Routing–ICMP –IPv6.

### **UNIT 2: TCP**

Services –header–connection establishment and termination–interactive data flow–bulk data flow–timeout and retransmission–persist timer –keep alive timer–futures and performance.

### **UNIT 3: IP IMPLEMENTATION**

IP global software organization–routing table–routing algorithms–fragmentation and reassembly error processing (ICMP) –Multicast Processing (IGMP).

### **UNIT 4: TCP IMPLEMENTATION I**

Data structure and input processing–transmission control blocks–segment format–comparison –finite state machine implementation–Output processing–mutual exclusion –computing the TCP data length.

## **UNIT 5: TCP IMPLEMENTATION II**

Timers–events and messages–timer process–deleting and inserting timer event–flow control and adaptive retransmission –congestion avoidance and control–urgent data processing and push function.

### **TEXT BOOKS:**

- 1.DouglasE.Comer, “Internetworking with TCP/IP Principles, Protocols and Architecture”, Vol 1 & 2, fourth edition, Pearson Education Asia, 2003.
- 2.W.Richard Stevens “TCP/IP illustrated” Volume 1 Pearson Education, 2003.

### **REFERENCES:**

- 1.Forouzan, “TCP/IP protocol suite” Second edition, Tata McGraw Hill, 2003.
- 2.W.Richard Stevens “TCP/IP illustrated” Volume 2, Pearson Education 2003.

## **15PCSZ04                      SOFTWARE PROJECT MANAGEMENT**

### **UNIT-I:**

SPM : Introduction - Overview of Project planning - Project Evaluation.

### **UNIT-II:**

Selection of an appropriate project approach - Software Effort Estimation.

### **UNIT-III:**

Activity Planning - Risk Management.- Resource Allocation

#### **UNIT-IV:**

Monitoring and Control - . Managing people and Organizing Teams

#### **UNIT-V:**

Software Quality : Place of software quality in project planning – Importance of software quality - ISO 9126 – Produce Versus Process quality Management - Small Projects.

#### **TEXT BOOKS:**

1. BOB Huges Mike Cotterell “Software Project Management” 2<sup>nd</sup> Edition, McGraw Hill

#### **REFERENCE BOOKS:**

1. Futrell, Quality software Project management, Pearson Education India.
2. Royce, Software Project management, Pearson Education India.

### **ELECTIVE-II**

#### **15PCSZ05**

#### **XML AND WEB SERVICES**

##### **Unit – I:**

XML & Ajax Basic XML – Document Type Definition – XML Schema – Document Object Model – Presenting XML –Using XML Parser - Essential Ajax - Ajax and the DOM, XML, CSS and Dynamic HTML.

##### **Unit-II**

Multiple device types using XML and XSLT- Using XML to define data- Transforming XML into other formats - XSLT.

##### **Unit-III**

Web services – web services and their approach to distributed computing – Web services technology – Web services architecture .

## **Unit-IV**

Basic Web services Technology – A Minimalist infrastructure for web services – SOAP – Simple Object Access Protocol – WSDL Web Services Description Language – UDDI: Universal Description Discovery and Integration – Web services at work – Interactions between the specifications – Related Standards.

## **Unit -V**

Creating and Using web services :- Understanding XML based web services – SOAP and web services – Additional needs for web services - creating a web service – Declaring a web service – Creating the web service class – Advertising a web service – Securing a web service – Exploring authentication options .

### **Text Books**

1. Alonso Casati ,Kuno ,Machiraju, “Web services Concepts Architectures and Applications- Springer International Edition- 2009. For Units 1, 2 and 5 Chapters 5, 6 and 7.
2. G. Andrew Duthie, Microsoft ASP .NET Programming with Microsoft VISUAL C# . NET step by step , PHI private Limited, New Delhi – 2006. For Units 3 and 4 Chapter 11
3. Professional WAP, Charles Archart, Nirmal Chidambaram &co,Wrox press Ltd, Fourth Edition,2002 - Chapter: 1,2,3,4,5,6,9,10,17,18.
4. Mitch Conrad, Kay Ether, Michal D. Thomas, "XML problem Design – solution”, Wiley India private Ltd; New Delhi- 2006.

### **Reference Books**

1. Joe Wigglesworth and Paula McMillan, “Java Programming : Advanced Topics” Thomson Learning Inc -2007.
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, " Developing Java Web Services", Wiley Publishing Inc., 2004.
3. SandeepChatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.

## **15PCSZ06**

## **CLIENT /SERVER TECHNOLOGY**

### **Unit-I**

Basic concepts of client /server: Characteristics. File servers –Data base servers - transaction servers – groupware servers – object servers – web servers – fat servers or fat clients – 2-tier – client/server building blocks - Operating system services: Base services –extended services – server scalability- client anatomy.

### **Unit-II**

NOS middleware - peer-to-peer communication –Remote Procedure Calls –MOM middleware – SQL database servers: Server architecture – stored procedures – triggers – rules.

### **Unit-III**

Online transaction processing – Decision support systems – OLTP vs. DSS – Data warehouses: elements – hierarchies – replication vs. direct access – replication mechanism — client/server transaction processing: transaction models – TP monitors.

### **Unit-IV**

Groupware: Components – Distributed objects: components and distributed objects. CORBA: components - object management architecture (IORB) – services – business objects.

### **Unit-V**

Client/server distributed system management-components - management application – Network management – OSI management framework - the desktop management interface - X/OPEN management standards – client/server application development tools - client /server application design.

### **TEXT BOOK**

1. Robert Orafli, Dan Harkey and Jeri Edwards, “Client/Server Survival guide”, 3rd Edition Wiley India Edition, 2007. Chapters: 2,3,5,7,8,10,12,15,16,19,21,22,30,31,32.

### **REFERENCE BOOKS**

1. Dawna Travis Dewire, “Client /Server Computing”, Tata McGraw Hill 2003.
2. Robert Orafli, Dan Harkey and John Wiley, “The Essential client/server Survival guide”, 2nd Edition Galgotia Publication, 2005.

## **15PCSZ07**

## **EMBEDDED SYSTEMS**

### **UNIT-I:**

Hardware Fundamentals for the Software Engineer: Terminology – Gates - Timing Diagrams - Memory - Advanced Hardware Fundamentals: Microprocessors - Direct Memory Access - Conventions used on Schematics.

### **UNIT-II:**

Interrupts: Microprocessors Architecture - Interrupt Basics- Survey of Software Architectures: Round Robin - Round Robin with Interrupts - Function Queue Scheduling Architecture - Real Time Operating System Architecture.

### **UNIT-III:**

Introduction to Real-Time Operating Systems: Tasks and Task States - Tasks and Data - More Operating System Services: Message Queues, Mail Boxes, Pipes - Timer

Functions – Events - Memory Management - Introduction Routines in an RTOS Environment.

#### **UNIT-IV:**

Basic Design using a Real Time Operating System: Principles - Encapsulating Semaphores and Queues - Hard Real Time Scheduling Considerations Saving Memory Space - Saving Power.

#### **UNIT-V:**

Embedded Software Development Tools: Host and Target Machines - Linkers / Locators for Embedded Software - Getting Embedded Software into the Target System - Debugging Techniques: Testing on your Host Machine - Instruction Set Simulators - The assert Macro - Using Laboratory Tools.

#### **TEXT BOOK:**

1. David E.Simon,” An Embedded Software Primer”, Pearson Education 1<sup>st</sup> Edition.

#### **REFERENCE BOOKS:**

1. Raj Kamal, Embedded Systems – Architecture, Programming and Design, Tata McGraw-Hill,2003
2. Steve Heath, Embedded Systems Design, Elsevier, 2003.
3. Frank Vahid and Tony Givargis, Embedded System Design, John Wiley And Sons, Inc, 2002.

### **15PCSZ08                      DATAMINING AND WAREHOUSING**

#### **Unit-I**

Introduction – Data mining – Data mining functionalities – kinds of patterns can be mined – classification – Data mining task primitives-major issues. Data pre-processing – Data cleaning – Data Integration and Transformation – Data Reduction – Discretization and concept hierarchy generation

#### **Unit-II**

Data warehouse – A multidimensional data model – Data warehouse architecture – Data warehouse implementation – From data warehouse to data mining-Efficient methods for data Cube computation.

#### **Unit-III**

Mining Frequent Patterns, Associations and Correlations: Basic Concepts- Efficient and scalable Frequent Itemset Mining Methods-Mining Various kinds of association rules-from association Mining to correlation analysis-constraint-based Association Mining. Classification and prediction – Issues regarding classification and prediction – classification by decision tree induction- Bayesian classification- Rule based classification.

#### **Unit-IV**

Cluster Analysis – Types of Data in cluster analysis- A categorization of Major clustering methods - Partitioning methods- Hierarchical methods – Density – based methods -Grid based methods -Model based clustering methods – outlier analysis.

#### **Unit-V**

Mining Data Streams-Mining Time-Series Data-Mining Sequence patterns in Transactional Data Bases-Multimedia Data Mining-Text Mining-Mining the world wide web.

#### **Text Book**

1.Jiwei Han, MichelineKamber, “Data Mining Concepts and Techniques”, Morgan Kaufmann Publishers an Imprint of Elsevier, 2006. Chapters: 1,2,3, 4.1, 5, 6.1- 6.6, 7.1-7.8, 7.11,8.1-8.3, 10.3-10.5

#### **Reference Books**

1. ArunK.Pujari, “Data Mining Techniques”, Universities Press (India) Limited, 2001.
2. George M. Marakas, Modern Data warehousing, Mining and Visualization: core concepts, Printice Hall, First Edition, 2002.
3. John Wang, Encyclopedia of Data warehousing and Mining, Idea Group Publishing, 2005.

### **ELECTIVE-III**

#### **15PCSZ09**

#### **SYSTEM ANALYSIS AND DESIGN**

##### **Unit-I**

**System Concepts and the Information Systems Environment:** Introduction – The systems concept – Characteristics of a system – Elements of a system – Types of Systems – The system Development Life Cycle: Considerations for candidate systems – The role of the systems Analyst: Historical Perspective – The multifaceted role of the analyst – The Analyst/user Interface – Rising positions in system Development.

##### **Unit-II**

**Systems planning and the Initial investigation:** Determined the user’s information Requirement. Case scenario problem – Definition and Project Initiation. Background Analysis. Fact – Finding. Fact Analysis, Determination of Feasibility. Information Gathering: Information Gathering tool – On site observation.

### **Unit-III**

The tools of structured analysis: The Data flow diagram – Data dictionary – Decision tree and structured English – Decision table – Pros and Cons of Each tool – Feasibility Study: System Performance definition - Feasibility study – Cost/Benefit analysis.

### **Unit-IV**

The process and stages of systems design – The process of Design – Design Methodologies – Major Development Activities – Audit considerations – Input – Output and Forms Design: Input Design. File organization.

### **Unit-V**

System Testing and Quality Assurance: Introduction – System testing. The nature of test data – The test plan – Quality Assurance – Role of the Data Processing Auditor Implementation: Conversion – Post implementation Review – Software maintenance: – Security, Disaster/recovery and ethics in system development: System security – Ethics in system development.

### **TEXT BOOK:**

1. Elias M. Awad, 'System Analysis & Design' II Edition –Galgotia Publication, 2003. Chapters: 1,2,3,4,5,6,7,8,9,10,11,12,13,16.

### **REFERENCE BOOKS:**

1. James A. Senn, 'Analysis and Design of Information System', MGH, 1989.
2. Lee, 'Introducing Systems Analysis & Design', VOL. I & II Galgotia NCC.

**15PCSZ10**

## **SOFTWARE TESTING**

### **UNIT-I:**

Assessing Testing capabilities and Competencies: The multiple roles of testing - What is a defect? – Building a software Testing Strategy.

### **UNIT-II:**

Establishing a software testing methodology - Determining software testing techniques.

### **UNIT-III:**

Eleven-step software testing process overview - Assess project management development estimate and status - Develop test plan - Requirements phase testing.

### **UNIT-IV:**

Design phase testing - Program phase testing - Execute Test and record result - Acceptance test.

**UNIT-V:**

Report test results - Testing software installation – Test software changes - Evaluate test effectiveness - Effective methods for software testing.

**TEXT BOOK:**

1. William Perry, "Effective Methods for software Testing", John Wiley & Sons, 2000,

**REFERENCE BOOKS:**

1. Software Testing Effective Methods, Tools and Techniques by Renu Rajani and Pradeep Oak Tata McGraw-Hill

**15PCSZ11****ENTERPRISE RESOURCE PLANNING****Unit-I**

Introduction: Definition – Functional modules – Evolution of ERP systems – Characteristics – Process Integration – Benefits of ERP application – Technology in ERP systems – Implementation costs – Implementation challenges – Facts about Implementations – ERP Implementation in India – ERP Market and Vendors : ERP Market – Vendors – Service oriented on Architecture – ERP Package feature – ERP Packages.

**Unit- II**

Extended ERP Services : Definition – SCM and ERP – ERP and BI – ERP and E-Commerce – Business Process – Re-engineering and ERP : Definition of ERP – Enterprise Redesign Principles - BPR Vs Total Quality – BPR and change management – Implementation approaches – Implementation methodology – Role of IT in BPR – BPR and ERP systems – BPR Success / Failure factors – BPR Implementation cases.

**Unit-III**

Planning for ERP: Planning for Implementation – Organizational Requirements – Economic and strategic justification – Analyzing Project scope and Broad implementation approach – Determining resources – Top management commitment – Realizing the commitment – Matching with right ERP systems – Creating a budget – Selecting the right ERP package – Organization preparation – Implementation of ERP: Design – Approaches – Lifecycle – Examples.

**Unit- IV**

Managing ERP Projects: Risk/Failure factors – Examples of ERP failure – Implementation risks – Management and Complexity of ERP Projects – Training users – Evaluating ERP projects. Going Live and Post implementation: Preparing to GO Live –

Strategies for migration to new ERP systems – GO Live performance surprises – Managing after GO Live – Maintenance of ERP systems.

#### **Unit-V**

Expanding ERP boundaries: Service oriented architecture – Enterprise Application Integration – Application service provider model. Case studies: Manufacturing Industries – Service Industries – Governmental Organizations

#### **Text Book**

1. Ashim Raj Singla, “Enterprise Resource Planning”, Cengage Learning India Pvt Ltd, New Delhi 2008. Chapters: 1 to 9.

#### **Reference Book**

1. Leon Alexis, “Enterprise Resource Planning”, Tata McGraw Hill, New Delhi, 1999.

### **15PCSZ12**

### **DIGITAL IMAGE PROCESSING**

#### **Unit-I DIGITAL IMAGE FUNDAMENTALS**

Image formation, Image transforms – Fourier transforms, Walsh, Hadamard, Discrete cosine, and Hotelling transforms.

#### **Unit-II IMAGE ENHANCEMENT & RESTORATION**

Histogram modification techniques - Image smoothening - Image Sharpening - Image Restoration - Degradation Model – Noise models - Spatial filtering – Frequency domain filtering.

#### **Unit-III IMAGE COMPRESSION & SEGMENTATION**

Compression Models - Elements of information theory - Error free Compression - Image segmentation – Detection of discontinuities - Edge linking and boundary detection - Thresholding – Region based segmentation - Morphology.

#### **Unit-IV REPRESENTATION AND DESCRIPTION**

Representation schemes- Boundary descriptors- Regional descriptors - Relational Descriptors

#### **Unit-V OBJECT RECOGNITION AND ENTERPRISE RESOURCE PLANNING**

Patterns and pattern classes - Decision-Theoretic methods - Structural methods.

**TEXT BOOK:**

1. Gonzalez, R.C. & Woods, R.E., Digital Image Processing, 2nd Edition, Pearson Education, 2002. (Chapters: 1, 2, 3, 4, 5, 8, 9, 10, 11 and 12).
2. Anil Jain, K., Fundamentals of Digital image Processing, Prentice Hall of India, 1989. (Chapters: 5, 7, 8 and 11).

**REFERENCE BOOKS:**

1. Sid Ahmed, Image Processing, McGraw Hill, New York, 1995.
2. Milan Sonka, Vaclav Hlavac and Roger Boyle, "Image processing Analysis and Machine vision", Second Edition, Thomson Brooks/Cole, 1999.
3. Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall, 3rd Edition.