M.Sc., Computer Science and Technology I SEMESTER

FUNDAMENTALS OF DIGITAL COMPUTERS

OBJECTIVES:

- To learn various Number Systems and Number base Conversion.
- Describe various codes and code conversions.
- Explain various Logic Gates and its truth tables.
- To learn about Boolean algebra and simplifications of different Boolean functions.
- Describe different Flip Flops, Registers, and Counters.
- To understand Adders and Subtractors.
- Explain the design of circuits using Decoders and Multiplexers.
- To learn about design of ROM and PLA.
- Describe the design of ALU, Status Register, and Accumulator.
- Explain the fundamentals of Digital Logic and Computer Design.

OUTCOMES:

- Bridge the fundamental concepts of computers with the present level of knowledge of the students.
- Familiarize operating systems, programming languages, peripheral devices, networking, multimedia and internet
- Understand binary, hexadecimal and octal number systems and their arithmetic.
- Understand how logic circuits and Boolean algebra forms as the basics of digital computer.
- Demonstrate the building up of Sequential and combinational logic from basic gates.

Unit 1: Number System - Converting numbers from one base to another - Complements - Binary Codes – Binary logic - Logic gates – Truth Tables.

Unit 2: Boolean Algebra- Axioms- Theorems- Simplification of Boolean functions- Map Method- (upto 5 variables) - McClausky Tabulation Method.

Unit 3: Sequential Logic – RS,JK,D and T Flip-Flops – Registers - Shift Registers - Counters - Ripple Counters - Synchronous counters - Design of Counters.

Unit 4: Adders-Subtractors-Decoders-Encoders-Multiplexer-Demultiplexer- Design of circuits using decoders/multiplexers-ROM-PLA-Designing circuits using ROM/PLA

Unit 5: Design of ALU – Design of Status Register - Design of Accumulator – Introduction to Computer design.

TEXT BOOKS:

(i) M. Morris Mano, 1994, Digital Logic and Computer Design, PHI, New Delhi.

REFERENCE BOOKS:

- 1. T.C. Bartee, 1991, Computer Architecture and Logical design, Tata McGraw-Hill, New Delhi.
- 2. V.Rajaraman,2002, Fundamentals of Computers, Third Edition, PHI, New Delhi.

WEB REFERENCES

- > <u>https://www.tutorialspoint.com/digital_circuits/index.htm</u>
- > https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/

NON MAJOR ELECTIVE HTML

OBJECTIVES: This course introduces to the tags used in HTML

UNIT - I : Introduction :Web Basics: What is Internet – Web browsers – What is Web page – HTML Basics: Understanding tags.

UNIT-II: Tags for Document structure(HTML, Head, Body Tag). Block level text elements: Headings paragraph(tag) – Font style elements: (bold, italic, font, small, strong, strike, big tags)

UNIT - III: Lists: Types of lists: Ordered, Unordered – Nesting Lists – Other tags: Marquee, HR, BR- Using Images – Creating Hyperlinks.

UNIT - IV : Tables: Creating basic Table, Table elements, Caption – Table and cell alignment – Rowspan, Colspan – Cell padding.

UNIT - V : Frames: Frameset – Targeted Links – No frame – Forms : Input, Textarea, Select, Option.

Recommended Texts

(i). HTML Complete Reference, Teach Yourself Web Publishing with HTML – Laura Lemay.

Reference Books

(i). HTML – E Stephen Mack, Janan Platt.

II SEMESTER

Practical –I: Digital - Lab.

OBJECTIVES: This course gives training in digital logic circuits.
1. Study of logic gates

a. Logic gates using discrete components
b. Verification of truth table for AND, OR, NOT, NAND, NOR and EXOR gates
c. Realisationof NOT, AND, OR, EX-OR gates with only NAND gates
d. Realisationof NOT, AND, OR, EX-OR gates with only NOR GATES

2. Implementation of logic circuits

a. Verification of associative law for AND, OR GATES

- b. Karnaugh's map reduction and logic circuit implementation
- 3. Adder and subtractor
 - a. Verification of Demorgan's law
 - b. Implementation of Half-adder and Half-subtractor
 - c. Implementation of Full-adder and full-subtractor
 - d. Four bit binary adder
 - e. Four bits binary subtractor using 1s and 2s complement
- 4. Shift registers
 - a. Implementation of shift register, serial transfer
 - b. Ring counter
 - c. 4 bit binary counter
 - d. BCD Counter
 - e. Counters for arbitrary sequence

HTML LAB

OBJECTIVE :This course introduces to the programming in HTML

- 01. Write a script to create an array of 10 elements and display its contents.
- 02. Create a simple calculator using form fields. Have two fields for number entry and one field for the result. Allow the user to be able to use plus, minus, multiply and divide.
- 03. Create a document and add a link to it. When the user moves the mouse over the link, it should load the linked document on its own. (user is not required to click on the link)
- 04. Create a document which opens a new window without a toolbar, address bar or a status bar that unloads itself after one minute.
- 05. Design an HTML page that includes document structure tags, title, line break, multiple headings and link to e-mail address.
- 06. Create an HTML file which is the main page with an image and some text messages along with hyperlinks which is linked to various pages. The navigation should be such that the links take you to the appropriate page and then back to the main page.
- 07. Create a HTML page to demonstrate the usage of Frames. Choose the content of the page on your own.
- 08. Design an application for pay slip through HTML forms.

III SEMESTER INTERNET AND ITS APPLICATIONS

OBJECTIVES:

- Connect to the Net via dial-up networking, cable, or a LAN, using Internet Connection Sharing
- Send and receive e-mail and attached files, including encryption and digital signatures
- Browse the Web with Netscape Navigator and Internet Explorer

OUTCOMES:

- Students came to about clear idea of using Internet.
- Students can able to create the own websites
- Students can use audio and video conferencing concept easily.

UNIT – I

Internet Concepts - Internet Services - Types of Accounts - Media for Internet - ISP - TCP/IP and Connection Software - - Disconnecting from the internet. Dial-up Networking - Setting up and internet Connection - Testing Connection

UNIT - II

Contenders - Issues in high-speed Connection - Connecting via ISDN, ADSL and Cable Modem - Intranets - Components of an Intranet - Steps for Creating Intranet - Maintenance - Connecting LAN to Internet

UNIT – III

E-mails - Downloading E-mails - Signatures and Stationery - Web Based E-mail - E-mail tasks - Outlook Express - Sending and Receiving files using Eudora - Outlook Express and Pine -Multiple e-mail accounts - Sending form letters - Formatting e-mail - E-mail mailing lists.

$\mathbf{UNIT} - \mathbf{IV}$

Forms of chat and Conferencing - Internet Relay Chat (IRC) - Chatting in Microsoft Chat and V.Chat - Starting and managing a channel - Web-based Chat - Direct Chat systems - MUDs, MOOs and mussles - Voice and Video Conferencing.

UNIT – V

Elements of web - Browsers - Security and Privacy Issues - Purchasing Products Online with wallet programs - Netscape Navigator and Communicator - Microsoft Internet Explorer.

TEXT BOOK:

1. Margaret Levine Young – Internet – The Complete Reference – Millennium Edition- TMH

Edition-1999

REFERENCE BOOKS: 1.Harley Hahn – The Internet – Complete Reference, Second Edition, TMH Edition.

WEB REFERENCES

- 1. www.slideshare.net
- 2. web.sonama.edu

III SEMESTER MICROPROCESSORS

OBJECTIVES:

- To introduce 8085 architecture and programming in assembly language.
- To introduce basic concepts of interfacing memory and peripheral devices to a microprocessor.
- To introduce serial and parallel bus standards.
- To introduce 8051 microcontroller.
- To introduce various advanced processor architectures such as 80X86, Pentium and Multicore Processors

OUTCOMES:

- > Construction of a maintainable assembly language program for an algorithm.
- ➤ Conclude the Intel 8085/8086 real mode memory addressing.
- > Designing of microprocessors/microcontrollers-based systems.

Unit-I: Introduction to micro computers, microprocessors and assembly languages – microprocessorarchitectureanditsoperations–8085MPU–8085instructionsetandclassifications

Unit-II:Writingassemblylevelsprograms–programmingtechniquessuchaslooping,counting and indexing addressing nodes – data transfer instructions – arithmetic and logicoperations– dynamicdebugging.

Unit-III: Counters and time delays – hexadecimal counter modulo10 counter – pulse timingsfor flashing lights– debugging counter and time delay program– stack – subroutine – conditionalcall and return instructions.

Unit-IV: BCD to binary and binary to BCD conversions – BCD to HEX and HEX to BCDconversions – ASCII to BCD and BCD to ASCII conversions – BCD to seven segment LEDcode conversions – binary to ASCII and ASCII to binary conversions – multi byte addition –multibytesubtraction –BCDaddition–BCDsubtraction –multiplication and division.

Unit-V: Interrupt – implementing interrupts – multiple interrupt 8085 – trap – problems onimplementing8085 interrupt – DMA memory interfaces – RAM & ROM – I/O interface – directI/O memorytrappedI/O.

Booksforstudy:

- 1. RSGaonkar–Microprocessorarchitecture–Programmingandapplicationwith8085/8080A– WileyEasternLimited– 1990
- 2. A Mathur Introduction to Microprocessor III Edition Tata McGraw Hill PublishingCo.Ltd. 1993

III SEMESTER PROGRAMMING IN C

OBJECTIVES:

- To gain a thorough understanding of the fundamentals of C programming
- To develop code, compile and test C programs.
- To take up Systems programming

OUTCOMES:

- ✓ Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.
- ✓ Demonstrate an understanding of computer programming language concepts.
- ✓ To be able to develop C programs on linux platform.
- ✓ Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
- ✓ Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures.
- \checkmark Student must be able to define union and enumeration user defined data types.
- ✓ Develop confidence for self education and ability for life-long learning needed for Computer language.

Unit-I: C fundamentals – character set – identifier and key works – data types – constants – variables – declarations – expressions – statements – arithmetic, unary, relational and logical, assignment and conditional operators – library functions.

Unit-II: Data input/output functions – simple c programs – flow of control – control structures – switch, break and continue, go to statements – comma operator.

Unit-III: Functions – defining, accessing functions – functions prototypes – passing arguments – recursions – storage classes – multi file programs.

Unit-IV: Arrays – defining and processing – passing arrays to functions – multidimensional arrays – arrays and string – structures – passing structures to functions – self referential structures – unions.

Unit-V: Pointers – declarations – passing pointers to functions – operation in pointers – pointer and arrays – arrays of pointers – structures and pointers – files: creating, processing, opening and closing – bit wise operations.

Books for study:

- 1. Gottfried B S Programming with C II Edition TMH Pub Co Ltd.
- 2. Kanetkar Y Let us C BPB Publication.

PRACTICAL - III: C PROGRAMMING AND MICROPROCESSORS LAB.

- 1. Summation of series
 - a. sin(x)
 - b. $\cos(x)$
 - c. exp(x)
- 2. String manipulations
 - a. Counting the number of vowels, consonants, words white spaces in a line of text and array of lines.
 - b. Reverse a string & check for palindrome
 - c. Sub string detection and count
 - d. Sub string removal
 - e. Find and replacing substrings
- 3. Recursion
 - a. nPr
 - b. nCr
 - c. GCD of two numbers
 - d. Maximum & minimum
 - e. Fibonacci sequence
 - f. Tower of Honoi
- 4. Matrix manipulation
 - a. Addition & subtraction
 - b. Multiplication
 - c. Transpose
 - d. Determinant of a matrix
 - e. Inverse of a Matrix
- 5. Sorting and searching
 - a. Insertion sort
 - b. Bubble sort
 - c. Selection sort
 - d. Linear search
 - e. Binary search

Microprocessors

- 1. Addition and subtraction
 - a. 8 bit addition
 - b. 16 bit addition
 - c. 8 bit subtraction
 - d. BCD subtraction
- 2. Multiplication and division
 - a. 8 bit multiplication
 - b. BCD multiplication
 - c. 8 bit division
- 3. Sorting and searching
 - a. searching for an element in a array
 - b. Sorting in Ascending order
 - c. Finding largest and smallest elements from an array
 - d. Reversing array elements
 - e. Block move
 - f. Sorting in descending order
- 4. Code conversion: BCD to HEX and HEX to BCD
- 5. Application: Traffic signal controller

IVSEMESTER COMPUTER GRAPHICS

OBJECTIVES:

- To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.
- To learn the basic principles of 3- dimensional computer graphics.
- Provide an understanding of how to scan convert the basic geometrical primitives, how to transform the shapes to fit them as per the picture definition.
- Provide an understanding of mapping from a world coordinates to device coordinates, clipping, and projections.

OUTCOMES:

- To list the basic concepts used in computer graphics.
- To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.
- To describe the importance of viewing and projections.

Unit-I: Video Display Devices – Raster Scan Systems – Input Devices – Hard Copy Devices-Graphics Software – Output Primitives- Attributes of Output Primitives.

Unit-II: Two – Dimensional Transformation – Clipping – Window-view port mapping.

Unit-III: User dialogue – Input of Graphical Data- Input Functions- Input Device Parameters-Picture Construction Techniques- Virtual Reality Environments.

Unit-IV: Three Dimensional Concepts – 3D Transformations- 3D Viewing.

Unit-V: Visible-Surface Detection : Back-Face Detection - Depth- Buffer Method – Scan Line Method – A-Buffer Method- Properties of Light – Infinitive Color Concepts- RBG Color Models-Computer Animation.

TEXT BOOKS:

1. D.Hearn and M.P.Baker - Computer Graphics- Second Edition - PHI- 1996.

REFERENCE BOOKS:

- 1. W.M.Neumann and R.F.Sproull Principle of Interactive Computer Graphics- McGraw Hill 1979.
- 2. Foley, Van Dan, Feiner, Hughes Computer Graphics Addison Wesley 2000.

WEB REFERENCE:

- 1. https://www.tutorialspoint.com/computer_graphics/index.htm
- 2. https://www.geeksforgeeks.org/computer-graphics-2

IVSEMESTER DATA STRUCTURES

Objectives:

- > To provide the knowledge of basic data structures and their implementations.
- > To understand importance of data structures in context of writing efficient programs.
- > To develop skills to apply appropriate data structures in problem solving.

Outcomes:

After completing this course satisfactorily, a student will be able to:

- ✓ Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms
- ✓ Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
- ✓ Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs
- \checkmark Demonstrate different methods for traversing trees.
- ✓ Compare alternative implementations of data structures with respect to performance •
 Compare and contrast the benefits of dynamic and static data structures implementations

Unit-I: Abstract Data Types – Asymptotic Notations- Complexity Analysis – Arrays – Representation of Arrays – Operations on Arrays - Ordered Lists - Polynomials.

Unit-II: Singly Linked Lists – Circular Linked Lists – Doubly Linked Lists – General Lists – Stacks – Queues – Circular Queues – Evaluation of Expressions.

Unit-III : Trees – Binary Trees – Binary Tree Traversals – Binary Tree Representations – Binary Search Trees – Threaded Binary Trees – Application of Trees (Sets) – Representation of Graphs – Graph Implementation – Graph Traversals- Application of Graph Traversals- Minimum Cost Spanning Trees – Shortest Path Problems .

Unit-IV: Internal Sorting – Optimal Sorting Time – Sorting Large Objects – Sorting with Tapes-Sorting with Disks.

Unit-V: Hashing – AVL Trees - Red-Black Trees – Splay Trees - B-Trees.

TEXT BOOK:

1. E.Horowitz, S.Sahni and Mehta – Fundamentals of Data Structures in C++ - Galgotia- 1999.

REFERENCE BOOK:

✓ Gregory L.Heileman – Data Structures , Algorithms and Object Oriented Programming – Mc-Graw Hill International Editions – 1996.

WEB REFERENCES:

- ✓ <u>https://www.geeksforgeeks.org/data-structures</u>
- https://www.researchgate.net/publication/313108957_Data_Structure_Lecture_Notes_Hand_Wr itten

IVSEMESTER PROGRAMMINGINC++

Objectives:

- ✓ To impart knowledge to students in writing C++programs.
- ✓ To explain various OOPSconcepts.
- ✓ Explain about structure of C++ program, and various ProgrammingConstructs.
- ✓ In-depth analysis of core concepts like Inheritance, Polymorphism etc.
- \checkmark Working with files and file management class.

Outcomes:

- Understand the features of C++ supporting object oriented programming.
- Understand the relative merits of C++ as an object oriented programming language.
- Understand how to produce object-oriented software using C++.
- Understand how to apply the major object-oriented concepts to implement object oriented programs in C++, encapsulation, inheritance and polymorphism.
- Understand advanced features of C++ specifically stream I/O, templates and operator overloading.

Unit-I: Principles of Object Oriented Programming (OOP) – Software Evaluation -- OOP Paradigm – Basic Concepts of OOP – Benefits of OOP – Applications of OOP.

Unit-II: Introduction to C++ -- Tokens – Keywords – Identifiers – Variables – Operators – Manipulators – Expressions and Control Structures – Pointers – Functions – Function prototyping – Parameters Passing in Functions – Values Return by Functions – Inline Functions – Friend and Virtual Functions.

Unit-III: Classes and Objects – Constructors and Destructors -- Operator overloading --Type Conversions – Type Of Constructors – FunctionOverloading.

Unit-IV: Inheritance – Types of Inheritance – Virtual Functions and Polymorphism Constructors in inheritance – Mapping Console I/O operations.

Unit-V: Files – File Streams – File operations – File pointer – Error Handling during file operations – Command line arguments.

Books for Study:Stanley Lippmann, JoseeLajoie – C++ Primer – Third Edition – AddisonWesley.

1. Robert Lafore - Object Oriented Programming in Microsoft C++ -Galgotia

IVSEMESTER SOFTWARE ENGINEERING

OBJECTIVES:

- ✓ Improve entrepreneurial endeavors to demonstrate professional advancement through significant technical achievements and expanded leadership responsibility;
- ✓ Demonstrate the ability to work effectively as a team member and/or leader in an everchanging professional environment; and
- ✓ Progress through advanced degree or certificate programs in computing, science, engineering, business, and other professionally related fields.

OUTCOMES:

- ✓ Graduates of the program are expected to demonstrate:
- ✓ An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- ✓ An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors

Unit-I: The Product-The Process-Project Management Concepts-Software Projects And Project Metrics

Unit-II: Software Project Planning-Risk Analysis And Management-Project Scheduling And Tracking-Software Quality Assurance.

Unit-III: Software Configuration Management-System Engineering-Analysis Concepts And Principles-Analysis Modeling .

Unit-IV: Design Concepts And Principles-Architectural Designs-User Interface Design.

Unit-V: Component level Design-Software Testing Techniques-Software Testing Strategies-Technical Metrics For Software.

TEXT BOOK:

- 1. Roger S. Pressman Software Engineering A Practitioner's approach 5th edition McGraw Hill. **REFERENCE BOOKS:**
 - 1. Ian Somerville Software Engineering 5th Edition Addison Wesley.

WEB REFERENCES

- 1. <u>https://www.tutorialspoint.com/software_engineering/software_engineering_tutorial.pdf</u>
- 2. <u>https://www.bcanotes.com/Download/SoftwareEngineering/SOFTWARE%20ENGINEERING.</u> <u>pdf</u>

PRACTICAL-IV: DATA STRUCTURES USING C++

- 1. Implements PUSH, POP operations of stack using arrays.
- 2. Implements PUSH, POP operations of stack using pointers.
- 3. Implement add, delete operations of a queue using arrays.
- 4. Implement add, delete operations of a queue using pointers
- 5. Conversion of infix to postfix using stack operations.
- 5. Postfix expression evaluation.
- 6. Addition of two polynomials using Arrays and Pointers.
- 7. Polynomial multiplication using singly linked list
- 8. Creation, Insertion and deletion in doubly linked list.
- 10. Binary tree traversals (inorder, preorder and post order) using linked list and recursion.
- 11.Non- recursive inorder traversal
- 12.Non- recursive preorder traversal
- 13. Non- recursive postorder traversal
- 14. Depth first search for graphs using recursion
- 15.Breadth first search for graphs.

V SEMESTER

COMPUTER NETWORKS

Objectives:

At the end of the course, the students will be able to:

- Build an understanding of the fundamental concepts of data communication and computernetworking.
- Understand how errors detected and corrected that occur intransmission
- How collisions to be handled when many stations share a singlechannel
- Know about routing mechanisms and different routingprotocols
- Understand transport layerfunctions
- Know about different application layer protocols

Outcomes:

After completing this course the student must demonstrate the knowledge and ability to:

- Describe the basis and structure of an abstract layered protocolmodel
- Independently understand basic computer networktechnology.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of eachlayer.
- Identify the different types of network devices and their functions within anetwork
- Understand and building the skills of subnetting and routingmechanisms.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist innetwork design and implementation
- Understand how the Internet workstoday.
- Conversant with primitives of network applicationprogramming.

Unit 1: Introduction – Network Hardware – Software – Reference Models – OSI and TCP/IP models – Example networks: Internet, ATM, Ethernet and Wireless LANs - Physical layer - guided transmission media

Unit 2: Wireless transmission - Communication Satellites – Telephones structure –local loop, trunks and multiplexing, switching. Data link layer: Design issues – error detection and correction.

Unit 3: Elementary data link protocols - sliding window protocols – Data Link Layer in the Internet - Medium Access Layer – Channel Allocation Problem – Multiple Access Protocols.

Unit 4: Network layer - design issues - Routing algorithms - Congestion control algorithms - IP protocol - IP Address - Internet Control Protocol.

Unit 5 : Transport layer - design issues - Connection management - Addressing, Establishing & Releasing a connection – Simple Transport Protocol – Internet Transport Protocol (TCP).

1. RecommendedTexts

(i) A. S.Tanenbaum, 2003, Computer Networks, Fourth Edition, - Pearson Education, Inc, (Prentice hall of India Ltd), Delhi.

2. Reference Books

- B. Forouzan, 1998, Introduction to Data Communications in Networking, Tata McGraw Hill, New Delhi.
- (ii) F. Halsall, 1995, Data Communications, Computer Networks and Open Systems, AddisonWessley.
- D. Bertsekas and R. Gallagher, 1992, Data Networks, Prentice hall of India, NewDelhi.
- (iv) Lamarca, 2002, Communication Networks, Tata McGraw Hill, NewDelhi.

3. Website, E-learningresources

(i) http://authors.phptr.com/tanenbaumcn4/

SEMESTER V DATABASE MANAGEMENT SYSTEMS

OBJECTIVES:

- Knowledge of DBMS, both in terms of use and implementation/design.
- Gain Knowledge with SQL.
- Increased proficiency with the programming language C++.
- Experience working as part of team.
- Experience with analysis and design of (DB) software.

OUTCOMES:

- Understand the use of database concepts and structures and query language
- Understand the E R model and relational model
- To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.
- Understanding the Functional Dependency and Functional Decomposition.
- Apply various Normalization techniques
- Perform PL/SQL programming using concept of Cursor Management, Error Handling, Package and Triggers
- Execute various advance SQL queries related to Transaction Processing & Locking using concept of Concurrency control.
- Understand the method of query processing and techniques involved in query optimization.
- Understand the principles of storage structure and recovery management.

UNIT I: Advantages and Components of a Database Management Systems – Feasibility Study – Class Diagrams – Data Types – Events – Normal Forms – Integrity – Converting Class Diagrams to Normalized Tables – Data Dictionary.

UNIT II: Query Basics – Computation Using Queries – Subtotals and GROUP BY Command – Queries with Multiple Tables – Subqueries – Joins – DDL & DML – Testing Queries.

UNIT III: Effective Design of Forms and Reports – Form Layout – Creating Forms – Graphical Objects – Reports – Procedural Languages – Data on Forms – Programs to Retrieve and Save Data – Error Handling.

UNIT IV: Power of Application Structure – User Interface Features – Transaction – Forms Events – Custom Reports – Distributing Application – Table Operations – Data Storage Methods – Storing Data Columns – Data Clustering and Partitioning.

UNIT V: Database Administration – Development Stages – Application Types – Backup and Recovery – Security and Privacy – Distributed Databases – Client/Server Databases – Web as a Client/Server System – Objects – Object Oriented Databases – Integrated Applications.

TEXT BOOK:

1. G. V. Post – Database Management Systems Designing and Building Business Application – McGraw Hill International edition – 1999.

REFERENCE BOOKS

- 1. Raghu Ramakrishnan Database Management Systems WCB/McGraw Hill 1998.
- 2. C.J. Date An Introduction to Database Systems 7th Edition Addison Wesley 2000.

WEB REFERENCES

https://www.javatpoint.com/dbms-tutorial https://www.tutorialspoint.com/dbms/index.htm https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/

SEMESTER V OPERATING SYSTEMS

OBJECTIVES:

- To study about Basics of Operating system
- To study about Process Management
- To know about Memory Management
- To know about File Management System
- MS-DOS and UNIX operating systems.

OUTCOMES:

- > Describe and explain the fundamental components of a computer operating system
- > Describe and explain the fundamental components of a computer operating system
- Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.
- Describe and extrapolate the interactions among the various components of computing systems.
- Design and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.
- Measure, evaluate, and compare OS components through instrumentation for performance analysis.

Unit-I: Introduction - Multiprogramming - Time sharing - Distributed system - real-time Systems - I/O structure - Dual-mode operation - Hardware protection - General system architecture - Operating system services - System calls - System programs - System design and implementation. **Process Management:** Process concept - Concurrent process - scheduling concepts - CPU scheduling

Unit-II: Process Management contd.: Scheduling algorithms, Multiple processors Scheduling - Critical section - Synchronization hardware - Semaphores, classical problem of synchronization, Interprocess communication. **Deadlocks:** Characterization, Prevention, Avoidance and Detection.

Unit-III: Storage management - Swaping, single and multiple partition allocation - paging - segmentation - pages segmentation, virtual memory - demand paging - page replacement and algorithms, thrashing. Secondary storage management - disk structure - free space management - allocation methods - disk scheduling - performance and reliability improvements - storage hierarchy.

Unit-IV: Files and protection - file system organisation - file operations - access methods - consistency semantics - directory structure organisation - file protection - implementation issues - security - encryption.

Unit-V: Case Studies: MS-DOS and UNIX operating systems.

TEXT BOOK:

Operating_System_Concepts,_8th_Edition, AviSilberschatz, Peter Baer Galvin **REFERENCE BOOKS:**

- 1. A. Silberschatz and P.B. Galvin Operating System Concepts Addison-Wesley Publishing Company.
- 2. A.S. Godbole Operating Systems Tata McGraw Hill 1999

WEB REFERENCES:

http://www.nesoacademy.org/

SEMESTER V VISUAL PROGRAMMING

OBJECTIVES:

- > To describe basic terminology in Visual Basic.
- > Explain Creation of Forms, controls and Events.
- Describe loops, functions and procedure..
- > To learn different Front end and Back end designing methods

OUTCOMES:

- Explain basic concepts and definitions.
- > Express constants and arithmetic operations.
- Distinguish variable and data types.
- Recognize and arrange control structures.
- > Design a complete program using visual programming concepts.

Unit-I: Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

Unit-II: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

Unit-III: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.

Unit-IV: VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

Unit-V: Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

TEXT BOOK:

- 1. Gray Cornell Visual Basic 6 from the Ground up Tata McGraw Hill- 1996.
- 2. Noel Jerke Visual Basic 6(The Complete Reference) Tata McGraw Hill 1999.

REFERENCE BOOKS:

L. MathuKrithighaVenkatesh ,Web Technology, Margham Publication.

WEBSITE

LINK: http://portal.aauj.edu/portal_resources/downloads/programming/microsoft_visual_basic_black_b ook.pdf

PRACTICAL-V: RDBMS WITH VISUAL PROGRAMMING LAB.

Students are advised to use the concepts like Data Normalization, Link between table by means of foreign keys and other relevant data base concepts for developing databases for the following problems. The implementation of each problem should have necessary input screen Menudriven query processing and pleasing reports. The choice or RDBMS is left to the students. Necessary validations must be done after developing database.

- 1. Library Information Processing.
- 2. Students Mark sheet processing.
- 3. Telephone Directory maintenance.
- 4. Gas booking and delivering system.
- 5. Electricity Bill Processing.
- 6. Bank Transactions.
- 7. Pay roll processing.
- 8. Personal Information System.
- 9. Question Database and Conducting quiz.

SEMESTER VI COMPUTER ARCHITECTURE

OBJECTIVES:

- To explore the competence changeover of the computer system over different generations.
- To study about system architecture like bus structure and PCI etc.
- To learn the types of memory and their hierarchy.
- To learn about secondary storage backup technique like RAID
- In-depth analysis of core concepts like instruction fetch and execute, instruction cycle etc.
- To study about Instruction Pipelining, RISC etc.

OUTCOMES:

- Understand the architecture and functionality of central processing unit.
- Analyze some of the design issues in terms of speed, technology, cost, performance.
- Learn the concepts of parallel processing, pipelining and interprocessor communication.
- Exemplify in a better way the I/O and memory organization.

Unit-I : Central Processing Unit : General Register and Stack Organization – Instruction Formats – Addressing Modes- Data Transfer and manipulation – Program Control – RISC.

Unit-II :Pipelining – Arithmetic , Instruction and RISC Pipelining- Vector Processing – Array Processors.

Unit-III :Computer Arithmetic- Addition and Subtraction – Multiplication and Division Algorithms – Floating Point and decimal Arithmetic operations.

Unit-IV : Input–Output Organization – Peripheral devices - I/O Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt - Direct Memory Access – I/O Processor – Serial Communications.

Unit-V :Memory Organization – Memory Hierarchy – Main Memory – Auxiliary Memory-Associative Cache and Virtual Memory - Interconnection Structures - Interprocessor Arbitration.

Books for Study :

1. M.M.Mano – Computer System Architecture – 3 rd Edition – PHI – 1994. 2.J.P.Hayes – Computer System Architecture – McGrawHill – 1988.

SEMESTER VI

OBJECT ORIENTED ANALYSIS AND DESIGN

OBJECTIVES:

- \checkmark To implement association and aggregation using modeling.
- \checkmark To enable the student to implement state modeling
- \checkmark To enable the student to implement interactive modeling.
- \checkmark To enable the student to implement procedural and activity models.
- \checkmark To impart the skills needed to perform
- ✓ To enable the student to understand the concept of Object Oriented Analysis and Design.

OUTCOMES:

- > Understand impart the skills required for modeling.
- > Implementation of generalization and inheritance class modeling.
- > Understand the system analysis and design.
- ➢ Analyze the domain clearly.
- > Understand the technicalities of system design concepts.
- > Designing class diagrams and to understand the relationships .

Unit-I: System Development - Object Basics - Development Life Cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML.

Unit-II: Use-Case Models - Object Analysis - Object relations - Attributes - Methods - Class and Object responsibilities - Case Studies.

Unit-III: Design Processes - Design Axioms - Class Design - Object Storage - Object Interoperability - Case Studies.

Unit-IV: User Interface Design - View layer Classes - Micro-Level Processes - View Layer Interface - Case Studies.

Unit-V: Quality Assurance Tests - Testing Strategies - Object orientation on testing - Test Cases - test Plans - Continuous testing - Debugging Principles - System Usability - Measuring User Satisfaction - Case Studies.

TEXT BOOK:

1. Ali Bahrami - Object Oriented Systems Development - McGraw Hill International Edition - 1999. *REFERENCE BOOKS:*

- 1. Booch, Grady, (1994), Object-oriented Analysis & Design, Addison Wesley
- 2. Laganiere, Robert, (2004), Object-oriented Software Engineering, TMH
- 3. Rumbaugh, J., (2007), Object-oriented Modelling and Design with UML, Pearson Education
- 4. Satzinger, (2007), Object-oriented Analysis & Design with the Unified Process, Thomson

WEB REFERENCES

- ✓ http://web.engr.oregonstate.edu/~budd/Books/oopintro3e/info/chap03.pdf
- http://www.mamcet.com/it/e-learning/5sem/OOAD/OOAD-2-MARKS.pdf
- ✓ <u>http://www.perflensburg.net/cp-web/djruobde.htm</u>
- ✓ <u>http://www.trainingetc.com/PDF/TE1802eval.pdf</u>

SEMESTER VI JAVA PROGRAMMING

OBJECTIVES:

- 1. To learn how to implement Object-oriented designs with Java.
- 2. To identify Java language components and how they work together in applications.
- 3. To design and program stand-alone Java applications.
- 4. To learn how to use exception handling in java applications.

OUTCOMES:

- **1**.Students can understand how to design applications with threads in Java.
- 2. Students can learn itself how to read and write files in Java.
- 3. Students gain knowledge how to use java APIs for program development

UNIT – I

Introduction to Java - Features of Java - Object Oriented Concepts - Lexical Issues - Data Types - Variables - Arrays - Operators - Control Statements.

$\mathbf{UNIT}-\mathbf{II}$

Classes - Objects - Constructors - Overloading method - Access Control - Static and fixed methods - Inner Classes - String Class - Inheritance - Overriding methods - Using super-Abstract class.

UNIT – III

Packages - Access Protection - Importing Packages - Interfaces - Exception Handling -Throw and Throws - Thread - Synchronization - Messaging - Runnable Interface - Inter thread Communication - Deadlock - Suspending, Resuming and stopping threads -Multithreading.

$\mathbf{UNIT}-\mathbf{IV}$

I/O Streams - File Streams - Applets - String Objects - String Buffer - Char Array - Java Utilities - Code Documentation.

$\mathbf{UNIT} - \mathbf{V}$

Networks basics - Socket Programming - Proxy Servers - TCP/IP Sockets - Net Address - URL - Datagrams - Working with windows using AWT Classes - AWT Controls - Layout Managers and Menus.

TEXT BOOK:

- 1. Cay S.Horstmann, Gary Cornell Core Java 2 Volume I Fundamentals Addison Wesley.
- 2. P. Naughton and H. Schildt Java2 (The Complete Reference) Third Edition.

REFERENCE BOOKS:

1.K. Arnold and J. Gosling - The Java Programming Language - Second Edition.

- 2. "Java: The Complete Reference" by Herbert Schildt
- 3. "Effective Java" by Joshua Bloch

WEB REFERENCES

- > 1. https://www.theindianwire.com/tech/best-websites-learn-java-online-62025/
- 2. <u>https://dzone.com/articles/5-websites-to-learn-java-programming-for-free</u>

SEMESTER VI MULTIMEDIA SYSTEM

OBJECTIVES:

- To teach students understand about the meaning of multimedia system and usage of multimedia system
- To teach students understand about the multimedia in respect to many application including business, schools, home, education, and virtual reality
- To teach students about the cost involved in multimedia planning, designing, and producing.
- To teach students about the understand and illustrate some applications of multimedia tools in technology
- To teach students about the multimedia system of basic tools, text, images, planning and costing

OUTCOMES:

- A student can understand about the multimedia system of concept.
- A student can be improved knowledge in identify different hardware components required to run a multimedia system
- A student can be understanding and enumerate the different applications of multimedia system.
- A student can be improved the ability to read and describe the different stages of multimedia software development tools
- A student can be understanding and improved the various multimedia technology applications in our everyday lives.

UNIT – I

What is Multimedia: Definitions - CD-ROM and the Multimedia Highway - Where to use Multimedia - Introduction to Making Multimedia: The stages of a Project - What You Need – Multimedia Skills and Training: The team - Macintosh and Windows Production Platforms: Macintosh Versus PC - The Macintosh Platform - The Windows Multimedia PC Platform - Networking Macintosh and Windows Computers-Hardware Peripherals: Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices.

UNIT - II

Basic Tools: Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image-Editing Tools - Sound Editing Tools - Animation, Video and Digital Movie Tools - Helpful Accessories - Making Instant Multimedia: Linking Multimedia Objects - Office Suites - Word Processors - Spreadsheets - Databases - Presentation Tools. Multimedia Authoring Tools: Types of Authoring Tools - Card-and-Page-Based Authoring Tools - Icon-Based Authoring Tools - Time-Based Authoring Tools - Object-Oriented Authoring Tools - Cross-Platform Authoring Notes

UNIT - III

Text: The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext - Sound: The Power of Sound -Multimedia System Sounds - MIDI Versus Digital Audio - Digital Audio - Making MIDI Audio -Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your Multimedia Project - Toward Professional Sound: The Red Book Standard - Production Tips

UNIT - IV

Images: Making Still Images -Color - Image File Formats. Animation: The Power of Motion -Principles of Animation - Making Animations That Work -Video: Using Video - How Video works -Broadcast Video Standards - Integrating Computers and Television - Shooting and Editing Video -Video Tips - Recording Formats - Digital Video.

UNIT - V

Planning and Costing : Project Planning - Estimating - RFPs and Bid Proposals - Designing and Producing : Designing - Producing - Content and Talent : Acquiring Content - Using Content Created by Others - Using Content Created for a Project - Using Talent - Delivering : Testing - Preparing for Delivery - Delivering on CD-ROM - Compact Disc Technology - Wrapping It Up - Delivering on the World Wide Web

TEXT BOOK:

Tay Vaughan - Multimedia: Making it Work. - Fourth Edition - Tata McGraw Hill Edition - 1999.
 Walterworth John A - Multimedia Technologies and Application - Ellis Horwood Ltd. - London - 1991.

REFERENCE BOOKS:

1. John F Koegel Buford - Multimedia Systems - Addison Wesley - First Indian Reprint - 2000.

WEB REFERENCES

- http://www.tech-faq.com/multimedia.shtml
- http://www.cs.cf.ac.uk/Dave/Multimedia/node16.html
- http://www.jqjacobs.net/web/multimedia.html
- http://www.mediatician.com/multimedia-design.html
- > en.wikipedia.org/wiki/ Multimedia

Practical VI- Java Programming Lab.

Application

- 1. Finding area and Perimeter of a circle. Use Buffered Reader class.
- 2. Substring Removal from a String. Use String Buffer Class.
- 3. Determining the order of numbers generated randomly using Random Class.
- 4. Implementation of Point Class for Image manipulation.
- 5. Usage of Calender Class and manipulation.
- 6. String Manipulation using Char Array.
- 7. Database Creation for storing e-mail addresses and manipulation.
- 8. Usage of Vector Classes.
- 9. Implementing Thread based applications & Exception Handling.
- 10. 10. Application using synchronization such as Thread based, Class based and synchronized statements.

11.Applets

- 1. Working with Frames and various controls.
- 2. Working with Dialogs and Menus.
- 3. Working with Panel and Layout.
- 4. Incorporating Graphics.
- 5. Working with Colours and Fonts.

SEMESTER VII ADVANCED JAVA PROGRAMMING

OBJECTIVES:

- To understand the Java Servlets and Database connectivity.
- To familiarize with Java Bean
- To know more about the Enterprise Java Bean (EJB) Programming
- To get better knowledge about Perl Programming

OUTCOMES:

- Becomes familiar with the advanced features of Java Language.
- Develop Web Applications using Servlets and deploy in popular servers
- Understands Java Servlets and their life cycle
- Understands Java Web application directory structure
- Develop Server side components in a Java Web application
- To develop reusable components using JavaBeans.
- Understand the multi-tier architecture of web-based enterprise applications using Enterprise JavaBeans (EJB).
- Develop Stateful, Stateless and Entity Beans

Unit-I: Servlet overview – the Java web server – your first servlet – servlet chaining – server side includes- Session management – security – HTML forms – using JDBC in servlets – applet to servlet communication.

Unit-II: The software component assembly model – the Java beans development kit – developing beans – notable beans – using infobus – glasgow developments.

Unit-III: EJB architecture- EJB requirements- design and implementation- EJB session beans- EJB entity beans.

Unit-IV: EJB clients- deployment- tips,tricks and traps for building distributed and other systems- implementation and future directions of EJB.

Unit-V:Variable in pearl – pearl control structures and operators – functions and scope.

Books for Study:

- 1. Karl Moss Java servlets second edition- Tata McGraw Hill Edition.
- 2. Dustin R.Callaway-Inside Servlets Addison Wesley.
- 3. Joseph O'Neil Java Beans Programming –TMH.
- 4. TomValesky Enterprise JavaBeans Addison wesley.
- 5. Cay S Horstmann& Gary Cornell Core Java Vol II Advanced Features Addison Wesley Pvt. Ltd. Indian Branch.

SEMESTER VII DESIGN AND ANALYSIS OF ALGORITHMS

OBJECTIVES:

- ✓ Analyze the asymptotic performance of algorithms.
- ✓ Write rigorous correctness proofs for algorithms.
- \checkmark Demonstrate a familiarity with major algorithms and data structures.
- ✓ Apply important algorithmic design paradigms and methods of analysis.
- ✓ Synthesize efficient algorithms in common engineering design situations.

OUTCOMES:

- ✓ Students who complete the course will have demonstrated the ability to do the following:
- \checkmark Argue the correctness of algorithms using inductive proofs and invariants.
- ✓ Analyze worst-case running times of algorithms using asymptotic analysis.
- ✓ Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divideand-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
- ✓ Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.
- ✓ Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
- ✓ Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them.

Unit 1: Introduction - Definition of Algorithm – pseudocode conventions – recursive algorithms – time and space complexity –big-"oh" notation – practical complexities – randomized algorithms – repeated element – primality testing - Divide and Conquer:General Method - Finding maximum and minimum – merge sort.

Unit 2: Divide and conquer – Quicksort, Selection, Strassen's matrix multiplication – Greedy Method:General Method –knapsack problem - Tree vertex splitting - Job sequencing with dead lines – optimal storage on tapes.

Unit 3: Dynamic Programming: General Method - multistage graphs – all pairs shortest paths – single source shortest paths - String Editing – 0/1 knapsack.Search techniques for graphs – DFS-BFS-connected components – biconnected components.

Unit 4: Back Tracking: General Method – 8-queens - Sum of subsets - Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method - Traveling Salesperson problem.

Unit 5: Lower Bound Theory:Comparison trees - Oracles and advisory arguments - Lower bounds through reduction - Basic Concepts of NP-Hard and NP-Complete problems.

TEXT BOOK:

(i) E. Horowitz, S. Sahni and S. Rajasekaran, 1999, Computer Algorithms, Galgotia, New Delhi.

REFERENCE BOOKS:

- (i) G. Brassard and P. Bratley, 1997, Fundamentals of Algorithms, PHI, New Delhi.
- (ii) A.V. Aho, J.E. Hopcroft, J.D. Ullmann, 1974, The design and analysis of Computer Algorithms, Addison Wesley, Boston.
- (iii) S.E.Goodman and S.T.Hedetniemi, 1977, Introduction to the Design and Analysis of algorithms, Tata McGraw Hill Int. Edn, New Delhi.

WEB REFERENCES

- (i) <u>http://www.cise.ufl.edu/~raj/BOOK.html</u>
- (ii) <u>https://www.tutorialspoint.com/design_and_analysis_of_algorithms/design_and_analysis_of_algorithms_tutorial.pdf</u>

SEMESTER VII SYSTEMS SOFTWARE

Objectives:

- ✓ Distinguish between Operating Systems software and Application Systems software.
- ✓ Describe commonly used operating **systems**.
- ✓ Identify the primary functions of an Operating **System**.
- ✓ Describe the "boot" process.
- ✓ Identify Desktop and Windows features.
- ✓ Use Utility **programs**.

Unit-I: Introduction – System Software – Components of System software Evolution by System software – Model of Computer System; Introduction to software processors.

Unit-II: Assemblers: Elements of Assembly language programming – Overview of the Assembly process – Design of Two-pass Assembler – A single pass Assembler for the IBM PC – Macros and Macro processors.

Unit-III: Compilers: Aspects of compilation – Overview of the compilation process – Programming languages grammers – Scanning – Parsing – Storage allocation – Compilation of Expressions and Control structures – Code optimization – Compiler writing tools, Software processors for InteractiveEnvironments.

Unit-IV: Loaders and Linkage Editors: Loading, linking and Relocation – Program relocatability – Overview of linkage editing – A linkage editor for the IBM PC – Linking for program over-lays.

Unit-V: Software tools: Spectrum of software tools – Text editors – Interpreters and program generators – Debug monitors – Programming environments.

Book for Study:

Dhamdhere – Introduction to systems software – Tata Mc-GrawHill. **Reference:**

1. Leland L. Beck – System Software, An Introduction to System Programming" – Addison-Wesley.

SEMESTER VII WEB TECHNOLOGY

OBJECTIVES:

- \checkmark To know the application of web technology
- ✓ To study about the concepts of java script
- ✓ To learn the concepts of ASP.Net and C#

OUTCOMES:

- > To develop a dynamic webpage by the use of java script and DHTML.
- To connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
- To write a server side java application called Servlet to catch form data sent from client, process it and store it on database.

Unit 1: Introduction to Javascript – Advantage of Javascript – Javascript Syntax – Datatype – Variable – Array – Operator and Expression – Looping Constructor – Function – Dialog box.

Unit 2: Javascript document object model – Introduction – Object in HTMl – Event Handling – Window Object – Document object – Browser Object – Form Object – Navigator object – Screen object – Build in Object – User defined object – Cookies

Unit 3: Features of C# - C# and .NET framework – Getting started – C# language fundamentals – classes and objects – Inheritance and Polymorphism –Interfaces-Arrays – Indexers and Collections – Strings and Regular Expressions – Handling Exceptions – Delegates and Events.

Unit 4: ASP. NET Language Structure – Page Structure – Page event, Properties & Compiler Directives. HTML server controls – Anchor, Tables, Forms, Files. Basic Web server Controls – Lable, Textbox, Button, Image, Links, Check & Radio button, Hyperlink. Data List Web Server Controls – Check box list, Radio button list, Drop down list, List box, Data grid, Repeater.

Unit 5: Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced Issues – Email, Application Issues, Working with IIS and page Directives, Error handling. Security – Authentication, IP Address, Secure by SSL & Client Certificates.

1. Recommended Texts

- (i) I. Bayross, 200, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI, BPB Publications.
- (ii) G.Buczek, 2002, ASP.NET Developers Guide, TMH.
- (iii) Jesse Liberty, 2002, Programming C#", Second Edition, O'Reilly Press.

Reference Books:

- ✓ J. Jaworski, 1999, Mastering Javascript, BPB Publications.
- ✓ T. A. Powell, 2002, Complete Reference HTML (Third Edition), Tata McGraw-Hill, New Delhi.
- ✓ Richard Anderson, Professional ASP.NET, Wrox Press Ltd.
- ✓ Jeffrey Ritcher, 2002, Appplied Microsoft .NET framework Programming, Microsoft Press.
- ✓ Kumar Sanjeev and ShibiPanikkar, Magic of ASP.NET with C#, Firewall Media.

PRACTICAL - VII: ADVANCED JAVA PROGRAMMING - LAB

BEANS PROGRAMMING

- 1. Write a quiz applet and use gauge bean to update the score
- 2. Create a time zone list and retrieve any time which is given with zone using java beans
- 3. Develop a bean program that display a sequece of images in the form of slide show
- 4. Create a bean that displays a 3D plot of the following function

 $Z = f(x,y) = 0.01 \ *(x^2 - y^2)$

- 5. Create a frame that instantiates the beans registers paints to receive color event notifications from selectors adds the beans to the frame and makes the frame visible
- 6. Create a bean that displays a pie chart and use pie customizer to update the pie chart
- 7. Develop a bean that takes date and year and represent it in the local language in the form of a calender For (Eg.) French , Italian etc

SERVLETS PROGRAMMING

- 1. Write a servlet to display
 - a. IP address and Port no. of server
 - b. The host name and address of the computer on which your browser visits

- 2. Use a servlet as RMI client to enable a method given
- 3. Using servlet create a form which contain a text area, checkbox, radio button, label and text field with buttons
- 4. Create a chat program that uses servlets to communicate with 2 machines.
- 5. Create a servlet that gets the date and time of the system

PRACTICAL -VIII: WEB APPLICATIONS LAB.

- Write a script to create an array of 10 elements and arrange them in the ascending or descending order.
- 2. Write a function in Javascript that takes a string and looks at it character by character and perform all the String manipulation..
- 3. Create a simple calculator which should perform all the mathematical operations.
- Create a document and add a link to it. Create a new window on that document.
 When the user moves the mouse over the link, it should load the linked document on it.
- 5. Create a document that accepts the user's name in a text field form and displays the same the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.
- 6. Create a Web form for an online library. This form must be able to accept the Membership Id of the person borrowing a book, the name and ID of the book, and the name of the book's author. On submitting the form, the user (the person borrowing the book) must be thanked and informed of the date when the book is to be returned. You can enhance the look of the page by using various ASP.NET controls.
- 7. Use a calendar control in the page to determine the current date (when the book is borrowed) and calculate the due date, which must be three weeks from the current date. Display the due date to the user.
- 8. Create an array containing the titles of five new movies. Use this array as a data source for a drop down list control. The page must be capable of displaying the selected movie title to the user when the user clicks on the submit button.
- 9. Create a virtual directory in IIS. Create a global.asax file and include the "Session_Start" and "Session_End" and, "Application_BeginRequest" and "Application_EndRequest" events. Write a simple ASP.NET page and execute it in the browser. What is the output that you get?

- 10. Create an ASP.NET application. The application must consist of a form that accepts the user's credentials and validate the same. The user is then allowed to purchase items from the site by filling in a form. The user is finally informed when the purchased goods will be delivered to him/her.
 - a. Create a single default error page for any errors occurring in the application.
 - b. Use ASP.NET debugger to debug the application during its development
 - c. Enable tracing for the application. Display the user entered data in the purchase form as trace information at the bottom of the purchase page.
 - d. Switch off tracing for the application.
- 11. Create the Employee information and perform all the validator controls.

SEMESTER VIII

DISTRIBUTED DATABASES

OBJECTIVES:

- To enhance the previous knowledge of database systems by deepening the understanding of the theoretical and practical aspects of the database technologies, and showing the need for distributed database technology to tackle deficiencies of the centralized database systems
- To introduce basic principles and implementation techniques of distributed database systems,
- To expose active and emerging research issues in distributed database systems and application development
- To apply theory to practice by building and delivering a distributed database query engine, subject to remote Web service calls.

OUTCOMES:

- Get familiar with the currently available models, technologies for and approaches to building distributed database systems and services
- Have developed practical skills in the use of these models and approaches to be able to select and apply the appropriate methods for a particular case
- Aware of the current research directions in the field and their possible outcomes
- Able to carry out research on a relevant topic, identify primary references, analyze them, and come up with meaningful conclusions
- Able to apply learned skills to solving practical database related tasks.

Unit–I: Features of Distributed versus Centralized Databases – Why Distributed Databases – Distributed Database Management Systems (DDBMSs)- Review of Databases – Review of Computer Networks-Levels of Distribution Transparency- Reference Architecture for Distributed Databases – Types of Data Fragmentation – Distribution Transparency for read-only Applications – Distribution transparency for Update Applications – Distributed Database Access Primitives – Integrity Constraints in Distributed Databases - A Framework for Distributed Database Design – The Design of Database Fragmentation – The Allocation of Fragments.

Unit–II: Equivalence Transformations for Queries – Transforming Global Queries into Fragment Queries – Distributed Grouping and Aggregate Function Evaluation – Parametric Queries -Optimization of Access Strategies - A Framework for Query Optimization – Join Queries – General Queries. A Framework for Transaction Management – Supporting Atomicity of Distributed Transactions – Concurrency Control for Distributed Transactions – Architectural Aspects of Distributed Transactions

Unit–III: Foundations of Distributed Concurrency Control – Distributed Deadlocks – Concurrency Control Based on Timestamps – Optimistic Methods for Distributed Concurrency Control - Reliability – Basic Concepts Nonblocking Commitment Protocols –

Reliability and Concurrency Control – Determining a Consistent View of the Network – Detection and Resolution of Inconsistency – Checkpoints and Cold Restart - Distributed Database Administration – Catalog Management in Distributed Databases – Authorization and Protection.

Unit–IV: Distributed object database management systems – Fundamental object concepts and Models – Object – Abstract Data Types – Composition (Aggregation) – Class – Collection – Subtyping and Inheritance. – Object Distribution Design – Horizontal Class Partitioning – Vertical Class Partitioning – Path Partitioning – Class Partitioning Algorithms – Allocation – Replication – Alternative Client / Server Architectures – Cache Consistency – Object Identifier Management – Pointer Swizzling Object Migration – Distributed Object Storage – Object Query Processor Architectures – Query Processing Issues – Query Execution – Correctness Criteria – Transaction Models and Object Structures – Transactions Management in Object DBMSs – Transactions as Objects – Conclusion – Bibliographic Notes – Exercises.

Unit–V: Parallel Database Systems – Database Server Approach – Database Servers and Distributed Databases – Parallel System Architectures – Objectives – Functional Aspects – Parallel Data Processing – Parallel Query Optimization – Data Placement – Query Parallelism – Parallel Execution Problems – Initialization – Interferences and Convoy Effect – Load Balancing – Parallel Execution for Hierarchical Architecture – Problem Formulation – Basic Concepts – Load Balancing Strategy – Performance Evaluation – Conclusion – Bibliographic Notes – Exercises

Books for Study:

- 1. Stefano Ceri, Giuseppe Pelagatti Distributed Databases Principles &Systems- McGraw-Hill.
- 2. M.TamerOzsu, Patrick Valduriez Distributed database systems- Prentice Hall-Second Edition.

SEMESTER VIII E-COMMERCE

Objectives:

Students will try to learn:

- ✓ Understand concept of Ecommerce and its types.
- ✓ Be familiarized with technologies for Ecommerce.
- ✓ Understand different types of Online Payment systems.
- ✓ Understand Selling and marketing on web.
- ✓ Be familiarized with concept of Ebusiness and Ebusiness Models.
- ✓ Understand various E-business Strategies.

Outcomes :

- ✓ Distinguish between Operating Systems software and Application Systems software.
- ✓ Describe commonly used operating systems.

- ✓ Identify the primary functions of an Operating System.
- ✓ Describe the "boot" process.
- ✓ Identify Desktop and Windows features.
- ✓ Use Utility programs.

Unit-I: Overview of electronic commerce: introduction-definition of electronic commercepotential benefits of electronic commerce-internet and www as enablers of electronic commerce-impact of electronic commerce on business models-electronic commerce security- organization of topics-implications for the accounting. Electronic commerce and the role of independent third parties: introduction-consulting practices and accountantsindependence- cpa vision problem- new assurance services identified by the aicpa-impact of Electronic commerce on the traditional assurance function-third party Assurance of web based electronic commerce-implications for the accounting. Regulatory environment: introduction- cryptography issues-privacy issues-web linking-domain name dispuits-internet sales tax- electronic agreement and digital signature – Internet service providers and international libel laws-implications for theaccounting.

Unit-II: Edi electronic commerce and the internet: introduction-traditional Edi system-data transfer and standards-financial Edi-Edi systems and the internet-impact of Edi internet applications on the accounting profession. Risks of insecure system: introduction-overview of risks associated with internet transactions-internet associated risk- intranet associated risk- social engineering-risks associated with business transactions- risks associated with virus and malicious-implications of the accounting.

Risks management: introduction- control weekness vs control risks – Risk management paradigm – disaster recovery plans- Implications of the accounting.

Unit-III: Internet security standards:-introductions- standard setting issues and Committiees - security committiees and organization - security protocols and languages-messaging protocols –secure electronic payments and protocols-the role of accountants in internet related standard setting process. Cryptography and authentication: introduction-message security issues- Encryption techniques-key management-additional authentication methods-additional non repudiation techniques- implications of the accounting.

Unit-IV: Firewalls: introduction – firewall defined – TCP/IP-open system interconnect (OSI)-components of firewall-typical functionality of firewalls- network topology-securing the firewall-factors to consider in firewall design – in-house solutions Vs commercial fire wall software-limitations of security prevention provided by firewall – Implications of the accounting. Introduction-the *set* protocol – magnetic strip cards-smart cards-electronic check- electronic cash- implications of theaccounting.

Unit-V: Intelligent agent: introduction-definition of intelligent agent-capabilities of intelligent agent-level of agent sophistication-agent societies- intelligent agents and electronic commerce-online information Chain - limitations of agents- implications of the accounting. Web based marketing: introduction-the scope of marketing-business marketing and information technology-strategy congruence-the four ps applied to internet marketing – the fifth "P"personalization- in ternet marketing techniques-online adv. mechanisms –web site design issues- Intelligent agent and their impacts on marketing techniques- Implications of theaccounting.

Books for Study:

- 1. MarilynGreenstein,ToddMFeinman-ElectronicCommerce-- 2000. Tata McGraw Hill
- 2. Kalakota&Whinston Frontiers of Electronic Commerce 5th Indian Reprint Addison Wesley –2000.

SEMESTER VIII

INFORMATION SECURITY

OBJECTIVES:

- Exhibit knowledge to secure corrupted systems, protect personal data, and secure computer networks in an Organization.
- > Practice with an expertise in academics to design and implement security solutions.
- > Understand key terms and concepts in Cryptography, Governance and Compliance.
- Develop cyber security strategies and policies
- Understand principles of web security and to guarantee a secure network by monitoring and analyzing the nature of attacks through cyber/computer forensics software/tools.

OUTCOMES:

- \checkmark Analyze and evaluate the cyber security needs of an organization.
- ✓ Determine and analyze software vulnerabilities and security solutions to reduce the risk of exploitation.
- \checkmark Measure the performance and troubleshoot cyber security systems.
- ✓ Implement cyber security solutions and use of cyber security, information assurance, and cyber/computer forensics software/tools.
- ✓ Comprehend and execute risk management processes, risk treatment methods, and key risk and performance indicators
- ✓ Design and develop a security architecture for an organization.
- ✓ Design operational and strategic cyber security strategies and policies.

Unit 1: Introduction:Security- Attacks- Computer criminals- Method of defense Program Security: Secure programs- Non-malicious program errors- Viruses and other malicious code-Targeted malicious code- Controls against program threats.

Unit 2 : Operating System Security:Protected objects and methods of protection- Memory address protection- Control of access to general objects- File protection mechanism-Authentication: Authentication basics- Password- Challenge-response- Biometrics.

Unit 3 : Database Security: Security requirements- Reliability and integrity- Sensitive data-Interface- Multilevel database- Proposals for multilevel security. **Unit 4** : Security in Networks: Threats in networks- Network security control- Firewalls-Intrusion detection systems- Secure e-mail- Networks and cryptography- Example protocols: PEM- SSL- Ipsec.

Unit 5: Administrating Security:Security planning- Risk analysis- Organizational security policies- Physical security - Legal- Privacy- and Ethical Issues in Computer Security - **P**rotecting programs and data- Information and law- Rights of employees and employers-Software failures- Computer crime- Privacy- Ethical issues in computer society- Case studies of ethics.

TEXT BOOK:

1. C. P. Pfleeger, and S. L. Pfleeger, Security in Computing, Pearson Education, 4th Edition, 2003

2. Matt Bishop, Computer Security: Art and Science, Pearson Education, 2003.

REFERENCE BOOKS:

1. Stallings, Cryptography And Network Security: Principles and practice, 4th Edition, 2006

- 2. Kaufman, Perlman, Speciner, Network Security, Prentice Hall, 2nd Edition, 2003
- 3. Eric Maiwald, Network Security : A Beginner's Guide, TMH, 1999
- 4. Macro Pistoia, Java Network Security, Pearson Education, 2nd Edition, 1999
- Whitman, Mattord, Principles of information security, Thomson, 2nd Edition, 2005

WEB REFERENCES

- Kaufman, Perlman and Speciner, <u>Network Security: Private Communications in a</u> <u>Public World, second edition</u> (2003, Prentice Hall).
- ▶ Pfleeger and Pfleeger, <u>Security in Computing, 4/e</u> (2007, Prentice Hall).
- Matt Bishop, <u>Computer Security: Art and Science</u> (2002, Addison-Wesley). Shorter version which "omits much of the mathematical formalism": <u>Introduction</u> <u>to Computer Security</u> (2005, Addison-Wesley).

SEMESTER VIII

Unix and Shell Programming

OBJECTIVES:

- \checkmark To familiarize students with the concepts, design and structure of the
 - UNIX operating system
- \checkmark To teach students the use of basic UNIX utilities.
- \checkmark To understand some basic utilities of UNIX file system
- ✓ To teach students the principles of UNIX shell programming

 \checkmark To learn the basic components in constructing shell script program

OUTCOMES:

- A student can be understanding about the Unix file system with technical network communication and effective use of concepts and terminology.
- A student can be improved knowledge the Unix facility with Unix commands syntax and semantics.
- A student can be understanding command-line syntax and run commands that include options and arguments.
- A student can be improved the ability to read and understand specifications, scripts and programs.
- > A student can be understanding and improved the programming knowledge in IPC

UNIT – I

INTRODUCTION: File and common commands – Shell – More about files - Directories – Unix system – Basics of file Directories and filenames - Permissions – Inodes – Directory hierarchy - Devices – the grep family – Other filters – the stream editor sed – the awk pattern scanning and processing language – files and good filters.

UNIT - II

CONCEPTS OF SHELL: Command line structure – Metacharacters – Creating new commands – Command arguments and parameters – program output as arguments – Shell variables – More on I/O redirection – loop in shell programs – Bundle – Setting shell attributes, Shift command line parameters - Exiting a command or the shell, evaluating arguments – Executing command without invoking a new process – Trapping exit codes – Conditional expressions.

UNIT - III

SHELL PROGRAMMING: Customizing the cal command, Functions of command, While and Until loops – Traps – Catching interrupts – Replacing a file – Overwrite – Zap – Pick command – News command – Get and Put tracking file changes.

$\mathbf{UNIT} - \mathbf{IV}$

FEATURES IN UNIX: Standard input and output – Program arguments – file access – A screen at a time printer – On bugs and debugging – Examples – Zap – pick – Interactive file comparison program – Accessing the environment – Unix system calls – Low level I/O, File system Directories and inodes, Processors, Signal and Interrupts.

UNIT - V

PROGRAM DEVELOPMENT AND DOCUMENT PREPARATION: Program development – Four function calculator – Variables and error recovery – Arbitrary variable names, Built in functions, Compilation into a machine, Control flow and relational operators, Functions and procedures – Performance evaluation – Ms macro package – Troff level – Tbl and eqn preprocessors – Manual page – Other document preparation.

TEXT BOOK:

1. Brian W. Kernighan, Rob Pike - The UNIX Programming Environment - Prentice Hall of India(1984).

REFERENCE BOOKS:

- 1. Steven Earhart The UNIX System for MSDOS Users Galgotia book source P. Ltd. (1990).
- 2. StefenPrata Advanced UNIX A Programmer Guide.

WEB REFERENCES

- > 1 https://swcarpentry.github.io/shell-novice/reference
- > 2 http://www.osxfaq.com/Tutorials/LearningCenter
- > 3 http://www.research.att.com/sw/tools/uwin/
- > 4 http://www.microsoft.com/windows/sfu/
- 5 <u>https://www.shellscript.sh</u>

SEMESTER VIII

SOFTWARE PROJECT MANAGEMENT

OBJECTIVES:

- To understand the explanation of Software Project Management.
- To understand Project Evaluation and Program Management.
- To study about Project and Activity Planning.
- To understand Project Approach.
- To study about Software Effort Estimation.
- To understand Risk management.
- To study about Resource Allocation and Control.
- To understand Managing Contracts in Software Environment.
- To study about Software Quality.
- To understand Project Management Tools.

OUTCOMES:

- Understand Project Management principles while developing software.
- Gain extensive knowledge about the basic project management concepts, framework and the process models.
- Obtain adequate knowledge about software process models and software effort estimation techniques.
- Estimate the risks involved in various project activities.
- Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles.

Unit-I: Introduction to Software Project Management- Software project versus other types of project- problems- management control- Stakeholders- Requirement Specification – Information and control in organizations Introduction to step wise project planning- Select-identify scope and objectives- identify project infrastructure- Analyse project characteristics-products and activities- Estimate effort for each activity- Identify activity risks- Allocate resources- Review/ publicize plan- Execute plan and lower levels of planning. Project evaluation- Introduction – Strategic assessment- technical assessment- cost benefit analysis-cash flow forecasting- cost- benefit evaluation techniques- risk evaluation

Unit-II: Selection of an appropriate project approach- choosing technologies- technical plan contents list- choice of process models- structured methods-rapid application development-waterfall model- v-process model-spiral model- software prototyping- ways of categorizing prototypes- tools- incremental delivery- selecting process model - Software effort estimation-introduction- where-problems with over and under estimates- basis for software estimating-software effort estimation technique- expert judgement- Albercht function point analysis-Function points Mark II- Object points- procedural code oriented approach- COCOMO. Activity Planning- Objectives- Project schedules- projects and activities- sequencing and scheduling activities- network planning models- formulating a network model- using dummy activities- representing lagged activities- adding time dimension- forward pass- backward pass- identifying the critical path- Activity float- shortening project duration – identifying critical activities-precedence networks

Unit-III: Risk Management- nature of risk- managing- identification-analysis- reducingevaluating- z values. Resource allocation- nature of resources- requirements-schedulingcritical paths- counting the cost-resource schedule- cost schedule- scheduling sequence. Monitoring and control- creating the frame work- collecting the data- visualizing the progress- cost monitoring-earned value- prioritizing monitoring-Change control.

Unit-IV: Managing contracts- types of contract- stages in contract placement- terms of a contract-contract management- acceptance. Managing people and organizing teams-organizational behaviour background- selecting the right person for the job- instruction in the best methods-motivation- decision making-leadership-organizational structures. Software quality- importance- defining –ISO9126- practical measures- product versus process quality management- external standards-techniques to help enhance software quality

Unit-V: Small projects- some problems- content of a project plan. PRINCE 2- an overview-BS6079:1996- an overview - Euro method- an overview

Books for Study:

- 1. Bob Hughes and Mike Cotterell Software project management-second edition- McGraw Hill.
- 2. Walker Royce Software Project Management Addison Wesley.

Practical – IX: Unix Lab

Students can refer the following book for further details.

Charles Crowley - Operating Systems (A Design Oriented Approach) - TMH - 1998.

- 1. Inter Process Communication (IPC) using Message Queues.
- 2. IPC using pipes.
- 3. Implementation of wait and signal using counting semaphores.
- 4. Implementation of wait and signal using binary semaphores.
- 5. Atomic Counter update problem.
- 6. Counting Semaphores at the user level using binary semaphores.
- 7. Signaling processes.
- 8. Deadlock detection (for processes passing messages)
- 9. Process Scheduling: FCFS
- 10. Process Scheduling: Least Frequently Used.
- 11.Process Scheduling: Round Robin.
- 12.Producer-Consumer problem with limited buffers.
- 13. Dining-Philosopher Problem.
- 14.Reader-Writer problem.
- 15. Two Process Mutual Exclusion.

SEMESTER IX DATA WAREHOUSING AND DATA MINING

OBJECTIVES:

- > To identify the scope and essentiality of Data Warehousing and Mining.
- > To analyze data, choose relevant models and algorithms for respective applications.
- > To study spatial and web data mining.
- > To develop research interest towards advances in data mining.

OUTCOMES:

- ✓ Understand Data Warehouse fundamentals, Data Mining Principles
- ✓ Design data warehouse with dimensional modelling and apply OLAP operations
- ✓ Identify appropriate data mining algorithms to solve real world problems
- Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining
- \checkmark Describe complex data types with respect to spatial and web mining.
- ✓ Benefit the user experiences towards research and innovation. integration.

Unit 1: Introduction: Data Mining tasks – Data Mining versus Knowledge Discovery in Data bases – Relational databases – Data warehouses – Transactional databases – Object oriented databases – Spatial databases – Temporal databases – Text and Multimedia databases – Heterogeneous databases - Mining Issues – Metrics – Social implications of Data mining.

Unit 2: Data Preprocessing: Why Preprocess the data – Data cleaning – Data Integration – Data Transformation – Data Reduction – Data Discretization.

Unit 3: Data Mining Techniques: Association Rule Mining – The apriori Algorithm – Multilevel Association Rules – Multidimensional Association Rules – Constraint Based Association Mining.

Unit 4:Classification and Prediction: Issues regarding Classification and Prediction – Decision Tree induction – Bayesian Classification – Back Propagation – Classification Methods – Prediction – Classifiers accuracy.

Unit 5 : Clustering Techniques: cluster Analysis – Clustering Methods – Hierarchical Methods – Density Based Methods – Outlier Analysis – Introduction to Advanced Topics: Web Mining , Spatial Mining and Temporal Mining.

Recommended Texts

(i) J. Han and M. Kamber , 2001, Data Mining: Concepts and Techniques, Morgan Kaufmann, New Delhi.

Reference Books

- (i) M. H.Dunham, 2003, Data Mining : Introductory and Advanced Topics , Pearson Education, Delhi.
- (ii) PaulrajPonnaiah, 2001, Data Warehousing Fundamentals, Wiley Publishers.
- (iii) S.N. Sivananda and S. Sumathi, 2006, Data Mining, Thomsan Learning, Chennai.

Website, E-learning resources

- (i) http://www.academicpress.com
- (ii) http://www.mkp.com

SEMESTER IX IMAGE PROCESSING

OBJECTIVES:

- ✓ To know the application about Digital Information and Technology
- \checkmark To study about in What fields we are using the DIP concepts
- ✓ To measure various parameters for measurements of pixels

OUTCOMES:

- Students gain knowledge about Image processing.
- Students came to know about histogram processing.
- > Students itself use the concept of compression of image.

UNIT – I

Introduction – steps in image processing, Image acquisition, representation, sampling and quantization, relationship between pixels. – color models – basics of color image processing.

UNIT - II

 $Image \ enhancement \ in \ spatial \ domain - some \ basic \ gray \ level \ transformations - histogram processing - enhancement \ using \ arithmetic \ , \ logic \ operations - basics \ of \ spatial \ filtering \ and \ smoothing$

$\mathbf{UNIT}-\mathbf{III}$

Image enhancement in Frequency domain – Introduction to Fourier transform: 1- D, 2 – D DFT and its inverse transform, smoothing and sharpening filters

UNIT - IV

Image restoration: Model of degradation and restoration process – noise models – restoration in the presence of noise- periodic noise reduction. Image segmentation: Thresholding and region based segmentation.

$\mathbf{UNIT}-\mathbf{V}$

Image compression: Fundamentals – models – information theory – error free compression – Lossy compression: predictive and transform coding. JPEG standard.

TEXT BOOK:

1. R.C. Gonzalez, R.E.Woods, 2002, Digital Image processing, 2nd Edition, Pearson Education.

REFERENCE BOOKS:

1. Anil K. Jain, 1994, Fundamentals of Digital image Processing, 2nd Edition, Prentice Hall of India, New Delhi.

2.Pratt. W.K., Digital Image Processing, 3rd Edition, John Wiley & Sons.

3.Rosenfled A. &Kak, A.C, 1982, Digital Picture Processing, vol .I & II, Academic Press.

WEB REFERENCES

▶ 1. http://www.imageprocesssingplace.com/DIP/dip-downloads/

SEMESTER IX

NetworkProgramming

OBJECTIVES:

- Build an understanding of the fundamental concepts of data communication and computer networking
- > Understand how errors detected and corrected that occur in transmission
- ▶ How collisions to be handled when many stations share a single channel
- Know about routing mechanisms and different routing protocols
- Understand transport layer functions 6. Know about different application layer protocols

OUTCOMES:

After completing this course the student must demonstrate the knowledge and ability to:

- > Describe the basis and structure of an abstract layered protocol model
- > Independently understand basic computer network technology.
- > Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- > Identify the different types of network devices and their functions within a network

Unit-I: Overview of ActiveX Scripting–JavaScripting-Stand-AloneScripts-ActiveXControls-Creating ActiveX Controls.

Unit-II: ActiveX Documents-ActiveX Document Architecture-Creating ActiveX Documents.

Unit-III:URL Monikers-Hyperlinking-HyperlinkInterface-Working withURLMonikers-OverviewofISAPI-ISAPIExtension-ISAPIFilter.

Unit-IV: Designing IIS Applications -Building IIS Applications-Building Data DrivenDHTMLApplications.

Unit-V:ActiveXDocuments-Technology Migration Wizard- Modifying Code-Launchingand TestingDocument-TestingtheDLL.

BooksforStudy:

- 1. JohnPaulMuller–VisualC++5fromtheGroundUp-TataMcGrawHillEdition–1998(For first threeunits)
- 2. NoelJerke–VisualBasic6(TheCompleteReference)–TataMcGrawHillEdition–1999(For fourth and fifthunits)

SEMESTER IX

SOFTWARE TESTING

OBJECTIVES:

- To learn how to planning a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.
- To expose the advanced software testing topics, such as object-oriented software testing methods, and component-based software testing issues, challenges, and solutions.
- To gain software testing experience by applying software testing knowledge and methods to practice-oriented software testing projects.
- To gain the techniques and skills on how to use modern software testing tools to support software testing projects.

OUTCOMES:

- \checkmark Have an ability to apply software testing knowledge and engineering methods.
- ✓ Have an ability to design and conduct a software test process for a software testing project.
- ✓ Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
- ✓ Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- ✓ Have an ability to use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects.
- ✓ Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems
- ✓ Have an ability to use software testing methods and modern software testing tools for their testing projects.

Unit 1: Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.

Unit-2: Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques – Data Flow Testing Strategies

Unit 3: Domain Testing: Domains and Paths – Domains and Interface Testing – Linguistic –Metrics – Structural Metric – Path Products and Path Expressions.

Unit-4:Syntax Testing – Formats – Test Cases – Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.

Unit-5: Verification and Validation – Fundamental Tools - Levels of Testing – Testing Approaches – Types of Testing – Test Plan – Software Testing Tools: WinRunner – Silk Test

Recommended Texts

- (i) B. Beizer, 2003, Software Testing Techniques, II Edn., DreamTech India, New Delhi.
- (ii) K.V.KK. Prasad, 2005, Software Testing Tools, DreamTech. India, New Delhi.

Reference Books:

- (i) I. Burnstein, 2003, Practical Software Testing, Springer International Edn.
- (ii) E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
- (iii) R.Rajani, and P.P.Oak, 2004, Software Testing, Tata Mcgraw Hill, New Delhi.

Website, E-learning resources

 $http://www.amazon.com/gp/reader/0201877562/ref=sib_dp_pt/102-1957971-9723354 \# reader-link$

SEMESTER IX TCP/IPNetworks

OBJECTIVES:

At the end of the course, the students will be able to:

- > Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.

OUTCOMES:

- After completing this course the student must demonstrate the knowledge and ability to:
- > Independently understand basic computer network technology.
- > Understand and explain Data Communications System and its components.
- > Identify the different types of network topologies and protocols.

Unit-I: TCP/IPlayering- Link Layer- Ethernet andIEEE – Trailer encapsulation- SLIP-Address Resolution Protocol- example- ARP cache- ARP packet format- ARP examplesproxyARP-Internetcontrolmessageprotocol-Pingprogram-Tracerouteprogram-introduction– operation-LAN output-WANoutput-IP sourceroutingoption.

Unit-II: IProuting- introductionrouting principles-ICMPhost and network unreachableerrors- ICMP redirecterrors- ICMP routerdiscovery messages- Dynamic protocols-Unixroutingdaemons-RIP:RoutingInformationprotocol-OSPF-BGProuting CIDRUserdatagram Protocol: - UDP header- UDP checksum- example- IP fragmentation-DeterminingthepathMTUusing route-MaximumUDPdatagramsize-Trace ICMPSourceQuencherror- UDPserver design–Broadcasting and multicasting-Internet Group ManagementProtocol-example

Unit-III:Thedomain name system- message format- Pointer queries- Resource records-Caching-TFTP:TrivialFileTransferProtocol-example – security-Bootstrap Protocol-BOOTPPacketformat-Serverdesign-Througharouter-

vendorspecificinformation.Transmission Control Protocol – TCP services- TCP header-TCP connection establishmentand termination- Timeout of connection establishment-Maximum segment size- TCP halfclose-StateTransitiondiagram-Resetsegments-TCPserverdesign.TCPInteractivedataflow-interactiveinput-delayedacknowledgements-

Naglealgorithm-Windowsizeadvertisements - TCP Bulk data flow- Normal data flow-Sliding windows- window size –pushflag-Slow start-Bulk Data throughput-Urgent mode.

Unit-IV: TCPtimeout and retransmission- example- RTT example- congestion example-Fast retransmit and Fast recovery algorithms- ICMP errors- TCP persist timer- Silly windowsyndrome- TCP keep alive timer- example-TCP futures and performance-PAWS-T/TCP.SNMP- Simple Network Management Protocol- Object identifies- Instance Identification –ManagementInformation Base –Additional Examples.

Unit V: Rlogin Protocol – Rlogin Examples – Telnet Protocol – Telnet Examples – FileTransfer Protocol – FTP Examples – Simple Mail Transfer Protocol – SMTP Examples –SMTPFutures.

BooksforStudy:

- 1. W.RichardStevens -TCP/IP -IllustratedVolume 1 -TheProtocols –AddisonWesley.
- 2. BehrouzA.forouzan-TCP/IP–TMH.

PRACTICAL-X-NETWORK PROGRAMMING LAB

- 1. Working with Java Scripts.
- 2. Creating ActiveX Controls.
- 3. OLE Server.
- 4. OLE Container.
- 5. Working with URL Monikers.
- 6. Creating an ISAPI Extension.
- 7. Creating an ISAPI Filter.
- 8. Building IIS Application.
- 9. Data-Driven DHTML Application.
- 10. ActiveX Documents.