

**IT- 601 – Distributed System**

**Unit I:** Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System : Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms.

**Unit II:** Distributed Deadlock Detection: system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem.

**Unit III:** Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Security: Overview of security techniques, Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System.

**Unit IV:** Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault-tolerant services, Transactions with replicated data.

**Unit V:** Distributed Algorithms: Destination based routing, APP (assignment problem in parallel), Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. CORBA Case Study: CORBA, CORBA services.

**References:-**

- P K Sinha, "Distributed operating systems; Concepts and design", PHI Learning.
- Sunita Mahajan & Shah, Distributed Computing, Oxford Press
- Tanenbaum and steen, "Distributed systems: Principles and paradigms", 2<sup>nd</sup> edition, PHI Learning.
- Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
- Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Ed.
- Gerald Tel, "Distributed Algorithms", Cambridge University Press

**List of Experiment:-**

- Case Study – CORBA.
- Implementation of Deadlock through Simulation.
- Implementation of Election Algorithm.
- S/W Simulation for Clock Synchronization in Distributed System using Lamport's Algorithm.
- Implementation of Banker's Algorithm for avoiding Deadlock
- Case Study on.
  - a) Inventory Management
  - b) Supply Chain Management
  - c) Reservation System
  - d) University Counseling
  - e) Online Chain Management.

## **IT- 602 – Computer Graphics and Multimedia**

### **Unit I**

Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

### **Unit II**

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Bezier Method, B-spline Method.

### **Unit III**

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen. Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

### **Unit IV**

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases.

Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia -Tools, presentation tools, Authoring tools .

### **Unit V**

Compression & Decompression – Multimedia Data & File Format standards :-TIFF, MIDI, JPEG, DIB, MPEG,RTF, – Multimedia I/O technologies - Digital voice and audio – Video image and animation–Full motion video – Storage and retrieval technologies.

### **References:-**

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning, 3rd Indian reprint edition, 2008.
- 3.. Tay Vaughan, "Multimedia making it work", Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai, "Computer Graphics", McGraw Hill publication .  
Fundamental of Computer Graphics and Multimedia, Mukherjee, PHI Learning

### **Suggested list of experiment**

1. Write a program to implement DDA line drawing algorithm
2. Write a program to implement Bresenham's line drawing algorithm.

3. Write a program to implement Bresenham's circle drawing algorithm.
4. Write a program to draw an ellipse using Bresenham's algorithm.
5. Write a program to perform various transformations on line, square & rectangle.
6. Write a program to implement Cohen Sutherland line clipping algorithm.
7. Write a program to implement Liang-Bersky line clipping algorithm.
8. Write a program to implement Cohen-Sutherland polygon clipping algorithm to clip a polygon with a Pattern.
9. Write a program to convert a color given in RGB space to its equivalent CMY color space.
10. Study of various Multimedia file formats: -RTF, MIDI, GIF, JPEG, MPEG, TIFF etc.
11. Write a program to implement JPEG compression scheme for still images.
12. Write a program to perform Packbits compression & decompression.
13. Write a short program to create a TIFF file using bitmap segments and text files as the TIFF File components.
14. Write a program to convert a BMP file into either JPEG or GIF file.
15. Study of various Multimedia Authoring Tools.

**IT- 603 – Internet Technology & Network Management**

**Unit-I**

Binding Protocol Address- Address Resolution Protocol & RARP, ARP & RARP , packet format, Encapsulation.

Internet protocol: Introduction, Ipv4 header, Ipv4Datagrams, Encapsulation, Fragmentation and Reassembly, IP routing, Subnet addressing, Subnet mask, Supernetting- special case of IP addresses Ipv6-Motivation, frame format and addressing, comparison of Ipv4 and Ipv6.

**Unit-II**

ICMP: Introduction, ICMP Header, ICMP message types, ICMP timestamp request and reply, trace route, ping program .

Intra & inter domain routing-distance vector routing,RIP,Link State Routing,OSPF,Path

Vector Routing ,BGP.Unicast Routing protocols .

IGMP-IGMP message,operation,encapsulation.

**Unit-III**

TCP: Introduction, services, headers, connection establishment and termination, timeout of connection establishment, maximum segment size- half, close, state transition diagram, port no. and socket addresses , TCP timers

UDP: Introduction, UDP header, UDP checksum,UDP operations , encapsulation & decapsulation ,queuing ,SCTP-Services ,transmission sequence number,stream identifier ,stream sequence number,packet format. .

**Unit-IV**

BOOTP:-operation ,packet format.DHCP:-Address allocation,configuration & packet

Format,DNS:Distribution of name spaces , DNS in the internet . FTP:-Connection,

Communication ,command processing , TFTP. E-Mail:-SMTP ,POP & IMAP .

SNMP:-Management components,SMI,MIB.

**Unit-V**

Network management applications:-Configuration management, Fault Management , Performance management , Security management , Accounting management , Report Management , policy based management .

**References:-**

- 1.“TCP/IP-Protocol suite”, Forouzan, TMH 3<sup>rd</sup> edition
  - 2.“Computer Networks and Internets”, D.E.Comer, Pearson
  - 3.“Network management- principles & practice” Mani Subramaniam , Pearson education.
  - 4.“TCP/IP Illustrated” Volume I ,W. Richard Stevens, Addison Wesley
- Internetworking with TCP/IP Vol. I, II & III, Comer, PHI Learning

**IT- 604 – Web Technology**

**UNIT I**

History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, Web server and its deployment, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), format of the URL, Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

**UNIT II**

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations. DTD files and basics of Cascading Style Sheet (CSS). Document object Model (DOM) history and levels, Document tree, DOM event handling.

**UNIT III**

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java

**UNIT IV**

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI) , Message Oriented Middleware(MOM), EJB, Microsoft's Distributed Component Object Model( DCOM) Web Servers HTTP request types System Architecture Server side Scripting. Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

**UNIT V**

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

**References:-**

- 1.Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Education .
- 2.Web Technologies-TCP/IP Architecture, and Java Programming By Achyut S. Godbole and Atul Kahate
- 3.An introduction to Web Design+Programming by Paul S. Wang Sanda, S Katila,CENGAGE Learning.
4. Web Technology- A developer's Perspective by N.P.Gopalan, J.Akilandeswari , PHI Learning

**IT- 605 – Software Engineering & Project Management**

**Unit I**

Introduction, Software- problem and prospects Software development process: Software life cycle models, Open source software development, the unified process, documentation, configuration management, Safety, risk assessment.

**Unit II**

Measures, Metrics and Indicators, Metrics in the Process and Project Domains, Software Measurement, Metrics of Software Quality, S/W reliability, Software estimation techniques, loc and FP estimation. Empirical models like COCOMO, project tracking and scheduling, reverse engineering.

**Unit III**

Software requirements and specification: feasibility study, Informal/ formal specifications, pre/post conditions, algebraic specification and requirement analysis models, Specification design tools. Software design and implementation: Software design objectives, design techniques, User interface design, modularity Functional decomposition Data flow design, Data structure design, Object-oriented design, Design patterns implementation strategies like top-down, bottom-up, team etc.

**Unit IV**

Coding standard and guidelines, programming style, code sharing, code review, software components, rapid prototyping, specialization, construction, class extensions, intelligent software agents, reuse performance improvement, debugging. Software Testing Strategies: Verification and Validation, Strategic Issues, test plan, white box, black-box testing, unit and integration testing, system testing test case design and acceptance testing, maintenance activities.

**Unit V**

Organizing: Alternatives for project managers, matrix organization, Staffing, Directing: leadership, delegation, motivation, Controlling risk analysis and RMMM plan, project scheduling and tracking plan, SQA and quality planning, SCM activities and plan, project management plan. Re-engineering, reverse, forward engineering, web engineering, Software project management standards

**References:**

1. Software Engineering. A Practitioner's Approach by P,S. Pressman New edition McGraw.
2. Software project Management from concept to development Black Book by Kieron Conway, Dreamtech Press.
3. Software Engineering principle and practices- Deepak Jain Oxford University Press.
4. Software Engineering for students 4/e - Bell Douglas Pearson Education
5. Software Project Management, Kelkar, PHI Learning