

**CS - 501 –COMPUTER NETWORK**

**UNIT-I**

Introduction to computer networks and Internet, overview Advantages - network, Types-server based, peer, hybrid, Server types, Network Topology-Bus, Star, Ring, Star bus, Star ring, Mesh, Network Protocols-Hardware Protocols, software Protocols, Selecting and design the network for an organization.

**UNIT-II**

**Signal Transmission:-** Digital signaling, Analog Signaling, Bit synchronization, Baseband and Broadband transmission, Network Media types- properties & specialties, Network adapters – working principals, configuration and selection.

**UNIT-III**

**Network Layer:** Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithm's-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

**UNIT-IV**

**Internetworking:** -Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, ICMP, ARP, RARP, DHCP.

**Transport Layer:** - Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Crash Recovery.

**UNIT-V**

UDP, RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.

**Application Layer:-** Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH.

**REFERENCES:**

- Andrew & Tanenbaum, "Computer Network "
- Prakash C Gupta, "Data Communication
- William Stallings, "Data and Computer Communication"
- Computer Networking and the Internet (5th edition), Fred Halsall, Addison Wesley
- TCP/IP Protocol Suite (3rd edition), Behrouz Forouzan, McGraw Hill

**CS - 502 – DISTRIBUTED SYSTEM**

**UNIT-I**

**Introduction to Distributed Systems:** Introduction, Examples of distributed Systems, Architecture for Distributed System, Goals of Distributed system, Hardware and Software concepts, Distributed Computing Model, Advantages & Disadvantage distributed system, Issues in designing Distributed System.

**UNIT-II**

**Distributed Share Memory And Distributed File System:** Basic Concept of Distributed Share Memory (DSM), DSM Architecture & its Types, Structure of Share Memory Space, Consistency model , Desirable features of good Distributed File System , File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File application

**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 Multimedia & Database System:-** Distributed Data Base Management System (DDBMS), Types of Distributed Database.

**Distributed Multimedia:** - Characteristics of multimedia Data, Quality of Service Managements.

**UNIT-V**

**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.

**REFERENCES:**

- Sinha, Distributed Operating System Concept & Design, PHI
- Coulouris & Dollimore, Distributed System Concepts and Design, Pearson Pub
- Singhal & Shivratri, Advance Concept in Operating System, McGraw Hill
- Attiya & Welch, Distributed Computing, Wiley Pub.

**CS- 503 – ANALYSIS & DESIGN OF ALGORITHM**

**UNIT-I**

**Introduction:-** Data structure, models of computation, Algorithm, Analysis of Algorithms, Designing algorithms, analyzing algorithms, asymptotic notations, heap and heap sort, order architecture, time space complexities average and worst case analysis.

**UNIT-II**

**Divide and Conquer:** - Introduction to divide-and-conquer, Structure of divide-and-conquer algorithms, Binary search, quick sort, strassen's matrix Multiplication, Analysis of divide and conquer run time recurrence relations.

**UNIT-III**

**Study of Greedy Method:** - Overview of the greedy paradigm, examples of exact optimization solution (Minimum cost spanning tree), approximate solution (Knapsack problem), Single source shortest paths.

**UNIT-IV**

**Dynamic programming:** - Overview, difference between dynamic programming and divide and conquer, Applications, Shortest path in graph, Matrix multiplication, Traveling salesman Problem, longest Common sequence, Overview, 8-queen problem, and Knapsack problem

**UNIT-V**

**Computational Complexity:** - Complexity measures, Polynomial Vs non-polynomial time complexity, NP- hard and NP-complete classes, examples, Combinational algorithms, string processing algorithm, Algebraic algorithms, set algorithms.

**REFERENCES:**

1. Cormen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Horowitz & Sahani; Analysis & Design of Algorithm
3. Dasgupta; algorithms; TMH
4. Ullmann; Analysis & Design of Algorithm;
5. Michael T Goodrich, Roberto Tamassia, Algorithm Design, Wiley India

**LIST OF EXPERIMENTS: -**

1. Implementation and Time analysis of sorting algorithms. Bubble sort, Selection sort, Insertion sort, Merge sort and Quicksort
2. Implementation and Time analysis of linear and binary search algorithm.
3. Implementation of max-heap sort algorithm
4. Implementation and Time analysis of factorial program using iterative and recursive method
5. Implementation of a knapsack problem using dynamic programming.
6. Implementation of chain matrix multiplication using dynamic programming.
7. Implementation of making a change problem using dynamic programming
8. Implementation of a knapsack problem using greedy algorithm
9. Implementation of Graph and Searching (DFS and BFS).
10. Implement prim's algorithm
11. Implement kruskal's algorithm.
12. Implement LCS problem

**CS- 504 – DATABASE MANAGEMENT SYSTEM**

**UNIT-I**

**Basic Concepts:** - DBMS Concepts and architecture, Introduction, Review of file organization techniques, Database approach v/s Traditional File accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Functions of DBA and designer, Entities and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database,

**UNIT-II**

**Data models and Relational Databases:** - Various data models, Basic concepts of Hierarchical data model, Network data model, and Relational data model, Comparison between the three types of models, **Relational Data models:** - Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints, Intension and Extension,

**UNIT-III**

**Relational Query languages & SQL:** - Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union. **SQL:** - Data definition in SQL, update statements and views in SQL, QUEL & QBE, Data storage and definitions, Data retrieval queries and update statements.

**UNIT-IV**

**Database Design:-** Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, multi-valued dependencies.

**UNIT-V**

**Advance Concepts:-** Introduction of Distributed databases, protection, security and integrity constraints, concurrent operation on databases, recovery and transaction processing, basic concepts of object oriented data base system and design.

**References:**

1. Elmasri, Navathe, “Fundamentals Of Database Systems”, Addison Wesley
2. Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
3. Toledo; Data base management systems;TMH
4. Panneeselvam “Database Management System” PHI
5. Date C J, “An Introduction To Database System”, Addison Wesley
6. Ashutosh Kumar Dubey “Data Base Management Concepts” Katson Publication

**LIST OF EXPERIMENTS:-**

1. Study of DBMS, RDBMS and ORDBMS.
2. To study Data Definition language Statements.
3. To study Data Manipulation Statements.
4. Study of SELECT command with different clauses.
5. Study of SINGLE ROW functions (character, numeric, Data functions).
6. Study of GROUP functions (avg, count, max, min, Sum).
7. Study of various type of SET OPERATORS (Union, Intersect, Minus).
8. Study of various type of Integrity Constraints.
9. Study of Various type of JOINS.
10. To study Views and Indices.

**CS- 505 – OBJECT ORIENTED PROGRAMMING WITH JAVA**

**UNIT-I**

**Introduction to Java :-** Basics of Java programming, Data types, Variables, Operators, Control structure including selection, Looping, Java methods, Overloading, Math class, Arrays in java.

**UNIT-II**

**Objects and Classes :-** Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, String Buffer, File, this reference.

**UNIT-III**

**Inheritance and Polymorphism :-** Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

**UNIT-IV**

**Event and GUI programming:-** Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames. **Layout Managers:-** Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

**UNIT-V**

Multithreading in java, Thread life cycle and methods, Runnable interface, Thread synchronization, Exception handling with try-catch-finally, Collections in java, Introduction to Java Beans and Network Programming.

**Reference Books:**

1. Programming in Java, Sachin Malhotra & Saurabh Chaudhary, Oxford University Press.
2. The Complete Reference, Java
3. (Fourth Edition), Herbert Schild, TMH.
4. Java Programming, D. S. Malik, Cengage Learning.
5. Naughton & Schildt “The Complete Reference Java 2”, Tata McGraw Hill

**LIST OF EXPERIMENTS: -**

1. Write a Java program that displays area of different (Rectangle, Square, Triangle) using the method overloading.
2. To write a java program to print the individual digits of a 3 digit number
3. To write a java program to read an integer and find whether the number is odd or even.
4. To write a java program find the biggest of three integers
5. To write a java program to find the first 15 terms of Fibonacci sequence
6. To write a java program to work with the creation of objects for the class with overloaded constructor and user defined methods returning a value.
7. To write a java program to get and sort names by command line argument.
8. To write a java program to understand the concept of functionalities of different Bitwise operators.
9. Write a Java program that prints the following pattern

```
*****  
*****  
****  
***  
**  
*
```

10. To write a java program to understand the concept of Method Overriding
11. To write a java program to understand the steps in the creation of packages.
12. To write java program to implement the concept of interface.
13. To write a java program to handle the situation of exception multi inheritance.
14. To write a java program to implement the concept of exception handling.
15. To create a java program in a multithread environment and implement join() and is Alive() functions.
16. To write a java program to implement applet concept.



**CS- 506 – FUNDAMENTAL OF DOT NET PROGRAMMING LAB**

**UNIT-I**

An overview of the Dot NET framework, Common Language Runtime (CLR), the .NET Framework class library (FCL), ASP.NET to support Internet development, Languages supported by DOT NET, An introduction to VB . NET.

**UNIT-II**

An introduction to C#, Program structure, Basic IO, including output to the console and messages boxes, Data types, Arithmetic operations and expressions, Relational and logical operations, Control structures. These include "if", "while", "do-while", "for", and "switch", Namespaces and methods supplied by the FCL, Writing methods, Recursion and overloading Scoping rules, Arrays and data representation, Class definitions, Properties, indexers, access control, Inheritance and polymorphism, Delegates.

**UNIT-III**

**Classes and Objects:-** Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure.

**UNIT-IV**

**Visual Basic fundamentals:-** The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.

**UNIT-V**

Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

**REFERENCES:**

1. Introduction to Visual basic.NET - NIIT Prentice Hall of India,2005
2. Introducing Microsoft .NET- David S. Platt Microsoft Press”, Saarc Edition, 2001
3. Introduction to Microsoft® ASP.NET Work Book - Microsoft- Microsoft Press
4. Developing XML Web Services Using Microsoft® ASP.NET -Microsoft- Microsoft Press
5. Designing Microsoft ASP.NET Applications-Douglas J. Reilly-Microsoft Press
6. ASP.NET-Danny Ryan and Tommy Ryan-Hungry Minds Maran Graphics

**List of Experiments:-**

- Create an application to accept a character from console and check the case of the character
- Write a VB.NET program to accept any character from keyboard and display whether it is vowel or not.
- Write a Program in C# to check whether a no. is a Palindrome or not.
- Write a Program in C# to find the roots of Quadratic Equation.
- Write a Program in C# to demonstrate boxing and unboxing.
- Write a Program in C# to implement Stack operations.
- Write a Program in C# to find the second largest element in a single dimensional array.
- Write a Program in C# to multiply to matrices using Rectangular arrays.
- Write a VB.Net program to accept a string and convert the Case of the character.
- Develop a menu based VB.NET application to implement a text editor With cut, copy, paste, saved and close operations.
- Write a program in VB.Net to implement a calculator with memory and recall operation