DCS-301 - COMPUTER ARCHITECTURE

UNIT-I

COMPUTER ARCHITECTURE:- Register Transfer and Micro operations, Register Transfer: Bus and Memory Transfers. Three-State Bus Buffers, Memory Transfer. Arithmetic Micro operations: Binary Adder, Binary Adder Subtractor, Half Adder and Full Adder Binary Incrementer. Arithmetic Circuit, Logic Micro operations: List of Logic Micro operations, Hardware, Implementation. Shift Micro-operations: Hardware Implementation.

UNIT-II

BASIC COMPUTER ORGANIZATION AND DESIGN:- Instruction Codes: Stored Program Organization, Indirect Address Computer Registers: Common Bus System, Computer Instruction: Instruction Set Completeness Timing and Control Instruction Cycle: Fetch and Decode, Type of Instruction, Design of Basic Computer: Control Logic Gates, Control of Registers and Memory.

UNIT-III

CENTRAL PROCESSING UNIT:- Introduction General Register Organization: Control Word Stack Organization: Register Stack, Memory Stack, Reverse Polish Notation, Evaluation of Arithmetic Expressions Instruction Formats: Three Address Instructions, Two Address Instructions, One Address Instructions, Zero Address Instructions, RISC Instructions Addressing Modes .

UNIT-IV

INPUT OUTPUT ORGANIZATION:- Peripheral Devices: ASCII Alphanumeric Characters Input-Output Interface: I/O Bus and Interface Modules, I/O Versus Memory Bus, Isolated versus Memory-Mapped I/O Asynchronous Data Transfer: Strobe Control, Handshaking, Asynchronous Serial Transfer, Asynchronous Communication, Direct Memory Access (DMA): DMA Controller, DMA Transfer Input-Output Processor: CPU-IOP Communication Serial Communication.

UNIT- V

MEMORY ORGANIZATION:- Memory Hierarchy Main Memory: RAM and ROM Chips, Memory Address Map, Memory Connection to CPU Auxiliary Memory: Magnetic Disks, Magnetic Tape, CD, DVD Associative Memory Cache Memory, **Advance Processor Architectures:-** Instruction Pipelining, Arithmetic Pipelining, Super Scalar Processors, Parallel Processing, Flynn's Classification of Parallel Processing.

REFERENCES:-

1. Morris Mano. M., Computer System Architecture, PHI Learning.
2. Tanenbaum, 5/e, Structured Computer Organisation, PHI Learning.
3. Hwang & Brigg, Advanced Computer Architecture, McGraw Hill .
4. Stallings, 4/e, Computer Organisation & Architecture.

DCS-302 - OPERATING SYSTEM

UNIT-I

INTRODUCTION TO OPERATING SYSTEM:- Basics of Operating System, its functions, Objectives and Types of operating System, Introduction of time sharing, real time, Parallel and Distributed Multiprocessor embedded O.S., Structure of Operating System:- System components, Operating System services, System calls and Programs, System Structure.

UNIT-III

PROCESS MANAGEMENT:- Concepts of Processes; Process state (state diagram), Process Scheduling & Process control block (PCB), Operation on Processes, Threads multiprocessor scheduler, Process Scheduling & Algorithms- Basic Concepts, Scheduling criteria, Scheduling Algorithms- FCFS, SJF, Priority, RR, Multiple queues, Multiple processor Scheduling, Real time Scheduling, **Dead Locks** - Basic Concept of deadlock, deadlock detection, deadlock prevention, deadlock Avoidance, recovery from deadlock & Banker's algorithm.

UNIT-III

MEMORY MANAGEMENT :- Concept of Memory Management- Logical v/s Physical address, Cache Memory, Swapping, Allocation Techniques (contiguous and Non-contiguous), Fragmentation & Compaction, Concepts of paging and segmentation - Paged Segmentation & Segmented Paging, Concepts of Virtual Memory- Demand Paging, Page Fault, Page replacement and its Algorithms, Allocation of frames, Thrashing.

UNIT-IV

FILE MANAGEMENT SYSTEM:- File System interface: File Concepts, Types of Files, Access Methods, Directory Structure, File System mounting , Protection. , File System Implementation: File System Structure, Allocation Methods (Contiguous, Non Contiguous, index allocations), Free space Management (Fragmentation & compaction).

UNIT-V

DEVICE MANAGEMENT: -Input Output System : I/O Hardware & Interface, Kernel I/O Sub System, I/O request streams, Disk Management- Disk Structure, Disk Scheduling and its algorithms, RAID TECHNOLOGY**. Protection And Security: -** Goal of Protection, Domain of Protection, Security Problems Authentication.

LIST OF EXPERIMENTS:-
1. BIOS Configuration
2. Installation of Various Operation System
       a. Windows Vista
       b. Windows XP
       c. Linux
       d. Unix
3. File Management Commands, Use of Administration Commands, System Calls
4. Simulation of CPU Scheduling Algorithms (FCFS, SJF, RR)
5. Simulation of Memory Allocation, Paging and fragmentation
6. Case study of UNIX, Linux, Windows Vista & Windows XP.

REFERENCE BOOKS:-
1. Bach M.J., Design of the UNIX Operating System, PHI
2. Milankovic, Operating Systems, TMH
3. Ray Dunkan Advance Dos Programming, BPB.
4. Donovons & Mendric, Operating Systems, TMH.

DCS-303 - DATA COMMUNICATION

UNIT-I

Data Communication Concept & Technology :- Data Representation, Data Transmission , Modes of Data Transmission- Analog Data, Digital Data, Communication Channels, Synchronous & Asynchronous , Data & Communication, Series & Parallel data Communication, Bit rate and Baud rate, Bandwidth & Channel Capacity, Nyquists and Shannon's theorems

UNIT-II

Transmission Media :- Transmission Line Characteristic, Liner Distortions, Crosstalk, Twisted Pairs Cable, Coaxial Cable, UTP, STP, Optical Fibre – Multimode Fibres, Modal Dispersion, Mono Mode Fibre, Graded Index Fibres, Total Dispersion, Fibre Attenuation, Radio Media, UHF & Microwaves, Satellite Link, Equalization.
Modulation and Data Modems:- Concept of modulation and demodulation, Digital modulation methods: PCM, Amplitude, Shift-keying, Frequency Shift-keying, Quadrature PSK (QPSK), Differential PSK (DPSK), Simplex, Half Duplex, Full Duplex.

UNIT-III

Multiplexing, Spreading and Switching :- MULTIPLEXING: Frequency-Division Multiplexing, Wavelength- Division Multiplexing, Synchronous Time-Division Multiplexing, Statistical TimeDivision Multiplexing, SPREAD SPECTRUM: Frequency Hopping Spread Spectrum (FHSS), Direct Sequence Spread Spectrum. CHANNELIZATION: Frequency-Division Multiple Access (FDMA), Time- Division Multiple Access (TDMA), Code-Division Multiple Access (CDMA).

UNIT-IV

Error Detection and Correction:- Types of Errors, Redundancy, Detection Versus Correction, Forward Error Correction Reverse Error Correction. BLOCK CODING: Error Detection, Error Correction, Hamming Distance And Minimum Hamming Distance. Liner Block Code, CRC, Checksum. **Telephone and Cable Networks** :- Telephone network: Major Components, topology, Signaling, Services Provided by Telephone Networks, echo & noise in transmission system, DIAL-UP MODEMS: Modem Standards, type of modems

UNIT-V

Cellular and Satellite Networks:- SATELLITE NETWORKS: Orbits, Footprint, Three Categories of Satellites, GEO Satellites, MEO Satellites, LEO Satellites. CABLE TV NETWORKS and DATA TRANSFER: Traditional Cable Networks, Hybrid Fibre-Coaxial (HFC) Network, Bandwidth, Sharing., CELLULAR TELEPHONY: Frequency-Reuse Principle, Transmitting, Receiving, Roaming, First Generation, Second Generation, Third Generation, BLUETOOTH: Architecture, Bluetooth Layers

REFERANCES:-

1. Tomasi Wayne, Introduction to Data Communications and Networking, Pearson Education, 2007.
2. Rajneesh Agrawal and Bharat Bhushan Tiwari, Data Communication and Computer Networks, Vikas Publishing house Ltd.
3. S. Tanenbaum, Computer Networks, Fourth Edition, Pearson Education.
4. Leon-Gracia and I. Widjaja, Communication Networks, Tata McGraw Hill, 2004.

DCS-304 - DATA STRUCTURE & ALGORITHMS

UNIT-I

Introduction to Data Structures:-Introduction, Data and Information, Overview of Data structures, Types of data structures, Primitive and Non Primitive data structures and Operations, Algorithms.

Data Structures : Array-Introduction, Characteristic of Array, One Dimensional Array, Operation with Array, Two Dimensional Arrays, Three or Multi-Dimensional Arrays, Strings, Array of Structures, Drawbacks of linear arrays, Row Major Arrays, Column Major Arrays, Pointer and Arrays, Pointers and Two Dimensional Array, Array of Pointers, Pointers and Strings.

UNIT-II

Stacks and Queues:-What is a Stack?, Operations on Stack (PUSH & POP), Implementation of a Stack,Representation of Arithmetic Expressions, Infix, Prefix and Postfix Notations, Evaluation of Postfix Expression, Conversion of Expression from infix to postfix, What is Queue?, Implementation of the Queues (Simple and Circular), Disadvantages of simple queue, Priority Queues.

UNIT-III

Linked Lists:-Pointers and Linked allocation, Linked lists & Sequential list, Difference between Linked & sequential List, Operations on linear lists using singly linked & doubly linked storage structure, Insertion node at start, at end, at given position, Deletion of node at any position, Circular linked list, Application of linked lists.

UNIT-IV

Searching and Sorting:- Various sorting techniques, Selection sort - bubble sort- Quick sort, Merge sorting - Tree sort - Shell sort - Radix s5.2 Sequential searching, Binary searching, Hash tables – methods, Hashing functions, Collision resolution techniques.

UNIT-V

Trees: -Definitions and Concepts, Binary trees, Operations on binary trees, Binary tree and tree traversal algorithms, Operations on binary trees, List representation of Tree.

Strings:- Strings and their representations, String Conversion, String manipulation, String arrays

LIST OF EXPERIMENT

1. Programme implementation for :

a) Reading and printing of single array and multidimensional array.

b) Matrix manipulation.

c) For one dimensional, 2D & 3D array.

2. Program implementation for creating, updating, deleting, traversing, searching and sorting of arrays, linear and circular link, lists, doubly link list, stacks and queues, trees, post, prefix

3. Program implementation for manipulation of strings and match algorithms. Program implementation for adjacency matrix, traversing and searching.

4. Program implementation for adjacency creating matrix tree.

5. Develop algorithm for sequential search, write program for the same and test it.

6. Develop algorithm for binary search write program for the same and test it.

7. Develop algorithms for following string operations and implement them- Finding length of a given string

a. copying a string into another string

b. concatenating two strings.

c.String comparison finding a substring into a string.

REFERENCE BOOKS:

1. Introduction to Data structures, Author : Ashok N. Kamthane, Pub. Pearson Ed. in C

2. Drozdek Adams, Data Structures and Algorithms in C++, Vikas Publishing House Pvt. Ltd.

3. Kunth D. E., Art of Computer Programming and Fundamentals of Algorithms, Vol.-I, Narosa.

4. Wirth Niklaus, Algorithm + Data = Program, PHI Learning.

5. Lipschutz, Data structure, Schaum out line series, TMH.

DCS-305 - Programming with C++

UNIT-I

Principles of Object Oriented Programming:- Procedure-Oriented Programming, Object Oriented Programming paradigm, Basic concepts of Object Oriented Programming, Benefits of Object Oriented Programming, Object Oriented languages, Application of Object Oriented Programming.
Beginning with C++ :- What is C++?, Application of C++, C++ statements, Structure of C++ program, Creating the Source file, Compiling and Linking.

UNIT-II

Tokens, Expressions and Control Structures:- Tokens, Keywords, Identifiers, Basic Data Types User-defined data types, Derived Data types, Symbolic Constants, Type compatibility, declaration of variables, Dynamic initialization of variables, Reference Variables, Operators in C++, Memory Management Operators, Manipulators, Type cast operator, Expression and Implicit conversions, Operator precedence, Control Structures.

UNIT-III

Classes and objects:- Introduction to Class, Class Definition, Classes and Objects, Access Specifiers – Private, Public and Protected. Member functions of the class. Constructor and Destructor: Constructors, Overloading Constructors, Destructor. Polymorphism: Types of polymorphism. Function Overloading: - Function overloading, Precautions to be taken while overloading functions. Static Class Members, Static Member Functions, Friend Functions.

UNIT-IV

Operator Overloading:- Introduction to Operator Overloading, Operator Overloading Fundamentals. Implementing the operator functions, Inheritance Reusability, Inheritance concept-single inheritance. Using the derived class, Constructor and destructor in derived class, Object initialization and Conversion, Nested classes (Container classes),Multilevel inheritance., Multiple inheritance., Hybrid Inheritance. Virtual base class.

UNIT-V

Abstract and Virtual function:- Abstract Class, Virtual Function. Pure Virtual Function. Templates. Exception handling, Advanced File Input Output:- Input/output with files. Open a file, closing a file

LIST OF EXPERIMENTS:-

1. Problems involving sequence, selection and iteration.
2. Small problems mainly computational to illustrate expression and operator precedence.

3. Programmes such as: GCD, Sum of series, Fibonacci Series, Even and Odd series, Finding root of a function, Sequence of a numbers, Checking prime number, Largest among given number etc.
4. Problems relating to arrays: Print, Reverse, Sum, Maximum and Minimum, Insert and Delete elements etc.
5. Problems related to classes and objects
6. Problems to illustrate constructor & destructor
7. Problems related to inline functions.
8. Problems related to friend functions.
9. Problems related to operator overloading.
10. Problems related to default arguments, function overloading, functions overriding.
11. Problems related to different types of inheritance.

REFERENCES:

1. Herbert Schildt, "C++ the Complete Reference ", III edition, TMH 1999
2. Balagurusamy, Entrepreneurial "Object Oriented programming with C++", TMH
3. Barkakatin "objects oriented programming in C++" PHI 1995

DCS-306 Visual Basic Programming

UNIT-I

Introduction to Visual Basic:-Introduction Graphical User Interface (GUI), Programming Language (Procedural, Object Oriented, Event Driven), The Visual Basic Environment, How to use VB complier to compile/debug and run the programs.

UNIT-II

Introduction to VB Controls:- Textboxes, Frames, Check Boxes , Option Buttons, Images, Setting a Border & Styles, The Shape Control, The line Control, Working with multiple controls and their properties, Designing the User Interface, Keyboard access, tab controls, Default & Cancel property, Coding for controls.

UNIT-III

Variables, Constants, and Calculations:- Variables, Variables Public, Private, Static, Constants, Data Types, Naming rules/conventions, Constants, Named & intrinsic, Declaring variables, Scope of variables, Val Function, Arithmetic Operations, Formatting Data.

UNIT-IV

Decision & Conditions:- If Statement, If ?then-else Statement, Comparing Strings, Compound Conditions(And, Or, Not), Nested If Statements, Case Structure ,Using If statements with Option Buttons & Check Boxes, Displaying Message in Message Box, Testing whether Input is valid or not. Using Call Statement to call a procedure.

UNIT-V

Menus, Sub-Procedures and Sub-functions:- Defining / Creating and Modifying a Menu, Using common dialog box, Creating a new sub-procedure, Passing Variables to Procedures, Passing Argument ByVal or ByRef, Writing a Function Procedure.

Reference Books

1. Programming with VB 6.0 –Mohammed Azam
2. Mastering VB 6.0
3. Beginning VB 6.0 –Peter Wrights