

MCA Semester IV
4CSA-1 – Computer Hardware Interfacing

Unit – 1: Multiple Microprocessor System and Buses

8086/8088 maximum and minimum modes, DMA data transfer, Interfacing and refreshing DRAM, Math co-processor 8087 and I/O Processor 8089, Multiple bus microcomputer systems, VME Bus concepts, IEEE 488 HPIB, PC Bus, EISA Bus.

Unit – 2: Data Communication

Asynchronous serial data communication (Intel 8251 chip study), serial data transmission methods and standards: RS-232, RS-422, RS-423A and RS-449.

Unit – 3: Microcomputer System Peripherals – I

CRT Terminals, Graphic Terminals, choice of display cards MGA, CGA, EGA and monitors (monochrome and colour)

Unit – 4: Microcomputer System Peripherals – II

Floppy disk, Hard disk, Optical Disk, data storage, Printer mechanism, speech synthesis and recognition with a computer.

Unit – 5: Hardware Layout of IBM PC/XT

Motherboard, disk control, multi-serial I/O card, Fax and Telex card, EGA/VGA.

Books

1. Microprocessor and Interfacing by Douglas Hall [TMH]
2. Inside the IBM PC by Peter Norton
3. IBM PC/XT Hardware: Reference Manual
4. Microprocessor Systems: The 8086/8088 Family Architecture, Programming and Design by Liu and Gibson.
5. Advanced MS-DOS by Ray and Duncan

MCA Semester IV
4CSA-2 – Distributed Database Management System

Unit – 1: Introduction

Distributed data processing, Distributed Database Systems (DDBS), Problems of DDBSs, Completing factors and problem areas.

Unit – 2: Distributed DBMS Design and Architecture

DBMS standardisation, Architectural models for DDBMSs, DDBMS architecture and global directory issues, Alternative design strategies, Distributed design issues, Fragmentation and allocation.

Unit – 3: Overview of Query Processing

Query processing problems, Objectives of query processing, complexity of relational algebra operators, Characterisation of query processors, Layers of query processors.

Unit – 4: Transaction Management

Destination of a transaction, Problems of transactions, Types of transactions and Architecture re-visited.

Unit – 5: Distributed Concurrency Control

Sterilisability theory, Taxonomy of concurrency control mechanism, Locking-based concurrency, Control algorithms, Timestamp-based concurrency control, Optimistic concurrency control, Deadlock management and Relaxed concurrency.

Books

1. Principles of Distributed Database Systems II Edition by M. Tamer Ozsu and Patrick Valduriez [Pearson Education Asia]
2. Distributed Database – Principles and Systems by Stefano Ceri and Giuseppe Pelagatti [McGraw Hill]

MCA Semester IV **4CSA-3 – Computer Graphics**

Unit – 1:

Geometry and Line Generation – Introduction, Points and lines, Plane and co-ordinates, Line Segments, Perpendicular Lines, Vectors, Pixels and Frame Buffer. **Graphics Primitives** – Introduction, Display devices, Primitive Operations. **Polygons** - Introduction, Polygons, Polygon representation, Entering Polygons, Filling Polygons. **Transformations** – Introduction, Matrices, Scaling Transformation, SIN and COS, Sum of angles identifier, Rotation, Homogeneous Co-ordinates and Translation, Rotation about an arbitrary point, Other Transformations, Display procedures. **Segments** - Introduction, The Segment Table, Segment creation, Closing the segments, Other display, File Structure, Raster Technique.

Unit – 2:

Clipping Techniques – Introduction, Viewing Transformation, Viewing Transformation Implementation, Clipping, Clipping of Polygons, Adding clipping to the system, avoiding division, Generalised clipping, Position relative to an arbitrary line, Multiple windowing, **Interaction** – Introduction, Hardware, Input device handling algorithm, Event Handling, Sample devices, Delectability attributes, Simulating a locator with a pick, Pick with a locator, Echoing, Interactive Techniques.

Unit – 3:

3 – Dimension Geometry - Introduction, 3D geometry, Primitives and Transformation, Rotation about an arbitrary point, Parallel projection, Perspective projection, Viewing parameters, Conversion to view plane co-ordinates, 3D Viewing Transformation, Special Projection. **Hidden Surface and Lines** – Introduction, Back Face Removal, Pointers algorithm, Collection of polygons, Remembering the style, Hidden Surface Check.

Unit – 4:

Shading – Introduction, Diffusion, Illustration, Point-source Illustration, Specular Reflection, Transparency and shadows. **Curves** – Introduction, Curve generation, Implementation, Interpolating Polygon, B-Splines and Curves.

Unit – 5:

Visible Surface Detection – Classification of visible surface detection algorithm, Back-Face detection, Depth buffer method, A- buffer method, Scan line method, Depth sorting method, BSP Tree method, Area subdivision method, Octree method, Ray-Casting method, Curved surface, Wireframe method, Visibility Detection Method.

Books

1. Computer Graphics by Steven Harrington [TMH]
2. Computer Graphics by Hearn Baker [PHI]
3. Interactive Computer Graphics by Newman and Sproul
4. Computer Graphics by Rogers [TMH]

MCA SEMESTER –4 **4CSA-4:Distributed Operating System**

Unit-1: Fundamentals,

Introduction to Distributed computing System, Distributed Computing system model
Advantages of distributed computing Systems, Introduction to distributed operating system, introduction to computing environment.

Unit-2: Message Passing

Introduction, Characteristics of good message passing system, Issue in IPC by message passing, Synchronization, Buffering, Multidatagram message, Encoding & decoding of message data, Process addressing, Failure handling, Group communication

Unit-3: Remote Process Call (RPC)

Introduction, RPC Model, Implementation

RPC Mechanism, Stub generation, RPC messages, Types of RPC's, Marshaling argument & results, server Management, call semantics, Communication protocols for RPC's, Client-server Binding, Exception handling Security

Unit-4: Distributed Shared Memory (DSM)

Introduction, Architecture of DSM, Design & Implementation issues of DSM, Granularity, Structure of Shared Memory space, Consistency models, Replacement Strategy, Thrashing.

Unit-5: Resource, Process management & Synchronization

Introduction Resource & process management, Characteristics of good global scheduling algorithm, various approaches for resource management, process migration, Threads, Clock synchronization, Event ordering, Mutual exclusion, deadlock, Election algorithm

MCA, Semester-IV **4CSA-05: C# and Dot.Net**

Unit-1: C-Sharp Concept

Introduction to C sharp, the main method, program output, printing & formatting output, Compilation & execution, namespace declaration, Common Language Platform, General Structure of C sharp program, value type, String type, Interface type, Array type, delegate type, predefined type, concept of boxing & unboxing, Array types, Variables & parameters Operands, statements, Expression, Operators.

Unit-2: C sharp Classes & Methods

C sharp objects, classes Objects as Data type, Creating classes, Using an Object member function, providing constructor, types of class members, inheritance, Controlling members of class, Garbage collector, implementing classes ,class library & name space ,methods structure of method, method overloading, implementing method class containing functions, statements of control.

Unit –3: C sharp – Struct, Enum, Arrays and Strings

Struct types, struct declaration struct modifier, enums, Enumerator base type, Enum modifiers, enum members, enum values & operations, concept of arrays, passing array as parameters, array initialization, accessing array members, array object, array list, String operations, converting objects to string, string builder, file & folder operations, reading & writing text files, reading & writing binary files.

Unit-4: Dot Net (.Net) Overview

Introduction to .NET, the origins of .NET,.NET framework overviews(a common substrate for all development, key design goals, mega data, multiple language integration & support, name spaces),.Net framework base classes, user & program interface, web services.

Unit-5: Introduction to Common Language Runtime

Requirement of .NET application (assembly, module, type), common type systems (Custom type boxing, Unboxing value types), metadata (attribute custom, attributes)

Managed data (Managed heap, garbage collector), garbage collector optimization, planning objects.

Books:

1. C# (C sharp) Programming,by V.K.Jain,Dreamtech Press,New Delhi.(chap 4,5,6,7,8,10,11,12)
2. Programming in c# by Balaguruswamy, Tata McGraw Hill.
3. Introduction to DOT NET, be James Conard et.al. Shroff Publisher & Distributors Pvt. Ltd. (Mumbai) (chap. 1,2)
4. Introduction Microsoft Dot Net-David Platt, PHI publication.
5. C# (C sharp) Complete Reference- Schildt, Tata McGraw hill