ADVANCED MATHEMATICS
MCSE-101

Unit 1 : Partial Differential Equation

Solution of Partial Differential Equation (PDE) by separation of variable method, Numerical solution of PDE (Laplace, Poisson's, Parabola) using finite difference Methods.

Unit 2 : Matrices And Linear System Of Equations

Solution of linear simultaneous equations by Gaussian elimination and its modification, Crout's triangularization method, Iterative methods-Jacobins method, Gauss-Seidal method, Determination of Eigen values by iteration.

Unit 5 : Calculus Of Variations

Euler-Lagrange's differential equation, The Brachistochrone problems and other applications. Isoperi-metric problem, Hamilton's Principle and Lagrange's Equation, Rayleigh-Ritz method, Galerkin method.

Unit 4 : Fuzzy Logic

Operations of fuzzy sets, fuzzy arithmetic & relations, fuzzy relation equations, fuzzy logics. MATLAB introduction, programming in MATLAB scripts, functions and their application.

Unit 5 : Reliability

Introduction and definition of reliability, derivation of reliability functions, Failure rate, Hazard rate, mean time t future & their relations, concepts of fault tolerant analysis.

Reference Books:
1. Higher Engineering Mathematics - by Dr. B.S. Grewal; Khanna Publishers
2. Calculus of Variations - by Elsgole; Addison Wesley.
3. Applied Numerical Methods with MATLAB by Steven C Chapra, TMH.
4. Introductory Methods of Numerical Analysis by S.S. Shastry,
5. Calculus of Variations - by Galfand & Fomin; Prentice Hall.
6. Higher Engineering Mathematics by B.V. Ramana, Tata Mc Hill.
7. Advance Engineering Mathematics by Ervin Kreszig, Wiley Easten Edd.
8. Numerical Solution of Differential Equation by M. K. Jain
9. Numerical Mathematical Analysis By James B. Scarborogh
10. Fuzzy Logic in Engineering by T. J. Ross
11. Fuzzy Sets Theory & its Applications by H. J. Zimmersoms

INTERNET TECHNOLOGY

MCSE-102

UNIT-I

Introduction to Internet, History of Internet, Internet Standards, internetworking concepts, architecture, 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.

UNIT-II

Protocol layering principles, Multiplexing and Demultiplexing, 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-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

DNS, Working of DNS, DNS Header, Type of Records in DNS, forward and Reverse lookup, Configuration of Open Source (OS) DNS, working of DDNS - DHCP, DHCP header, Working of DHCP, Configuration of OS DHCP - FTP, Working of FTP, Understanding IPv6, CIDR, Hierarchical Routing, and Routing Protocol over internet. Multimedia over Internet, Voice over IP, Virtual Private network

UNIT-V

Intra & inter domain routing-distance vector routing, Routing information protocol (RIP),Link State Routing,OSPF,Path ,Vector Routing ,BGP, Unicast Routing protocols , Application layer protocols, TELNET protocols, File transfer protocols (FTP), Simple mail transfer protocol (SMTP), X-Window system protocol, Remote procedure call, Network file system.

References:-

1. Computer Networks and Internets With Internet Applications By Douglas E
Comer ,Pearson

2."TCP/IP-Protocol suite", Forouzan, TMH 3rd edition

3."Computer Networks and Internets", D.E.Comer, Pearson

OBJECT ORIENTED TECHNOLOGY & UML

MCSE-103

UNIT-I

C++ preliminaries :- Tokens, Keywords, Variable, scope of variables, Data type, pointers, operators-scope resolution, member de-referencing operators, memory management operators, manipulators, type castoperators; Symbolic constants, Type compatibility, Dynamic initialization, Reference variable, Call by reference.

UNIT-II
Objects & Classes:-
abstract & declaration syntax, visibility label-private, public, protected, Inline concept, Static data member & member function, Array of objects, Pointer to objects & members, Array of pointers to objects.

Functions :-
Declaration & definition, exploring arrays & strings, function overloading, const function, Passing & returning object through function, The Friend function.

UNIT-III
Constructors & Destructors:-
Default constructors, default argument constructor, parameterized constructor, Copy constructor, Destructor.
Inheritance and Polymorphism:-
Visibility modes, Single Inheritance, Multi-level Inheritance, Hierarchical Inheritance, Multiple Inheritance, Hybrid Inheritance, Virtual base class, abstract class. Function Overloading, Operator overloading, overloading unary, binary, string manipulation using operators. Run time - Virtual function, pointer to object, this pointer, pure virtual function.

UNIT-IV

Object Modeling Technique (OMT):- object model, function model, relationship among models, object diagrams, state diagrams, data flow diagrams, analysis.

Object oriented Design: Overview of object design, Combination the models, Designing algorithms, design optimization, Implementation of control, Adjustment, Design of association

UNIT-V

Unified Modeling Language (UML): Class diagram sequence diagram Use case diagram, Collaboration, diagram, state, chart diagram, Activity diagram, component diagram, deployment diagram, Object oriented Database: Relational Vs .object oriented database, the architecture of object oriented database, query language for Object Oriented database.

Reference Books:
1. Rambaugh, James Michael, Blaha - "Object Oriented Modelling and Design" - Prentice Hall
India/ Pearson Education
2. Jana, C++ & Object Oriented Programming, PHI
3. OOP in C++ by Lafore, Galgotia Pub.
4. Balagurusamy; Object oriented programming with C++; TMH

COMPUTER GRAPHICS & MULTIMEDIA

MCSE-104

UNIT-I
Introduction to Computer Graphics & Graphics systems:- Overview of computer graphics, Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matirix, 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
Geometry and line Generation: Points, Lines, Planes, Pixels and frame buffers, types of display devices, DDA and Brasenham's Line Algorithms, Brasenham's algorithms for circle generation, algorithm for ellipse generation, character generation, Aliasing and Antialiasing.

UNIT-III
2-D Transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation.
Windowing & Clipping: World Coordinate System, Screen Coordinate System, Viewing Transformation, Line Clipping & Polygon Clipping Algorithms

UNIT-IV
3-D VIEWING: Three-dimensional concepts, 3D display techniques, 3D representation polygon & curved surfaces. Design of curves & surfaces- Bezier's Method, B-spline methods, 3D transformation transition, scaling, composite transformation rotation about arbitrary axis, projections: Parallel & Perspective, Hidden surface and line removal; back face removal, depth buffer and scan line methods.

UNIT-V
Multimedia: Characteristics of a multimedia presentation , Uses of Multimedia,
Text –Types, Unicode Standard ,text Compression, Text file formats, **Audio**- Components of an audio system, Digital Audio, Digital Audio processing, Sound cards, Audio file formats ,Audio Processing software ,**Video**-Video color spaces, Digital Video, Digital Video processing, Video file formats.

Reference Books:

1. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
2. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson
Education, 2003.
3. Prabhat K. Andleigh & Kiran Thakur "Multimedia System Design", PH

ADVANCE DATABASE MANAGEMENT SYSTEM
MCSE-105

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, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer.

UNIT-II

E-R MODEL:- Entitles and attributes, Entity types, Value, Sets, Key attributes, Relationships, Defining the E-R diagram of database.Concept of Generalization, Aggregation and Specialization. Transforming ER diagram into the tables. Various other data models object oriented data Model, Network data model, and Relational data model.

RELATIONAL DATA MODELS:- Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity.

UNIT-III

STRUCTURED QUERY LANGUAGE:- Relational Query languages: Relational algebra and relational calculus, Relational algebra operations like select, Project, Join, Division, outer union.

FUNCTIONAL DEPENDENCIES & NORMALIZATION:- Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and losless join, problems with null valued and dangling tuples, multivalued dependencies.

UNIT-IV

TRANSACTION, CONCURRENCY& RECOVERY:- basic concepts, ACID properties, Transaction states, implementation of atomicity and durability, concurrent executions, basic idea of serializability, basic idea of concurrency control, basic idea of deadlock, failure classification, storage structure types, stable storage implementation, data access, recovery and atomicity- log based recovery, deferred Database modification, immediate Database modification, checkpoints.

UNIT-V

ADVANCE CONCEPTS:- Introduction to Distributed databases, protection, security and integrity constraints. Object Technology and DBMS, Comparative study of OODBMS Vs DBMS . Temporal, Deductive, Multimedia, Web & Mobile database .

References:-

1. Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
2. Atul Kahate , " Introduction to Database Management System", Pearson Educations
3. Ashutosh Dubey"DataBase Management concepts" kataria publication