

ADVANCED MATHEMATICS

MSE-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. Shastri,
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. Scarborough
10. Fuzzy Logic in Engineering by T. J. Ross
11. Fuzzy Sets Theory & its Applications by H. J. Zimmersoms

PROGRAMMING SYSTEM

MSE- 102

UNIT-1

Overview of language processors, Elements of assembly level programming, Design of assembler , Macro definition, Design of Macro preprocessor , Relocating and linking concepts , Design of linker , Programming Environments .

UNIT-II

Aspects of Compilation, overview of the various phases of compiler , Scanning, Syntax error handling , Symbol table conceptual design , Intermediate Code conceptual Design , Intermediate code interfaces , Dynamic storage allocation techniques , Dynamic Programming code generation algorithm ,Principal sources of optimization . Register allocation techniques.

UNIT –III

Motivation and overview, Structure of a Parallelizing compiler. Parallelism detection: data dependence, direction vectors, loop carried and loop independent dependences.Compilation for Distributed Machines Data partitioning, instruction scheduling, register allocation, machine optimization. Dynamic compilation. Introduction to code optimisation. Classical theory of data flow analysis. Bi-directional data flows. Unified algorithms for data flow analysis. Program representation for optimisation - SSA form, etc.Efficient code generation for expressions. Code generator generators (CGGs). Code generation for pipelined machines.

UNIT-IV

Design Issues in distributed operating system, Networking Issues , Communication Protocols , Message Passing , RPC in heterogeneous environment , Resource allocation ,Algorithms for Distributed control . Distributed Deadlock detection ,Mechanism for building Distributed File System, Distributed shared memory , Distributed scheduling .

UNIT-V

Resource Security and Protection: The Access Matrix model , Advanced models of protection,., Cryptography, Authentication, Multiprocessor System Architecture , Structure of multiprocessor operating systems , Process synchronization, scheduling , Memory management, Fault tolerance. Case studies : Unix Operating system, Amoeba, Andrew.

References:

- 1.Dhamdhare, Systems Programming and Operating systems, TMH
2. Keith Cooper , Engineering a Compiler , Elsevier Pub
- 3.Singhal & Shivaratri , Advanced concepts in Operating Systems, TMH
- 4.Sinha , Distributed operating system , PHI

OBJECT ORIENTED TECHNOLOGY & UML
MSE-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

ADVANCE DATABASE MANAGEMENT SYSTEM

MSE-104

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:- Entities 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 lossless 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

COMPUTER GRAPHICS & MULTIMEDIA

MSE-105

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 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

Geometry and line Generation: Points, Lines, Planes, Pixels and frame buffers, types of display devices, DDA and Bransenham's Line Algorithms, Bransenham'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