MCS 201 COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

Unit I

Unit II
Newton’s interpolation formulas, Lagrange’s interpolation formula, Newton’s divided Difference interpolation formula, Hermite’s problem and Hermite’s interpolation, Spline interpolations.

Unit III
Numerical Differentiation and Integration: Numerical differentiation, numerical integration, Trapezoidal rule, Simpson’s 1/3 rule, Newton-Cotes formulas, Gauss Legendre, Chebyshev formula.

Unit IV

Unit V
Discrete Probability: various definitions, additive and multiplicative theorem & problems, Bayes’ Theorem, Basic concept of Probability distribution, Binomial distribution, Poisson Distribution, normal distribution, correlation and regression analysis, Monte Carlo techniques.

Text Books:
1. Numerical algorithms computations in science and engineering by E. V. Krishnamurthy and S.K. Sen.
2. Numerical methods by E.S. Sastry.
MCS 202  SOFTWARE ENGINEERING

Unit I  

Unit II  
Software Design: fundamental design concepts, abstraction, information hiding, structure, modularity, modules and modularization criteria, coupling and cohesion. Design-notations- data flow diagrams, structure charts, HIPO diagrams, procedure templates, pseudo codes, structured flowcharts, structured english, decision tables. Design techniques-stepwise refinement, structured design, integrated top-down development. Object oriented design concept and methods, class and object definition, refinery operation.

Unit III  
Software Quality Assurance: quality concepts, metrics for software quality, software quality assurance, SQA activities, software reviews, formal technical reviews, software reliability.

Unit IV  
Software testing techniques: Software testing fundamentals, white box testing, basis path testing, control structure testing, black box testing. Software testing strategies: strategic approach to software testing, unit testing, integration testing, validation testing, system testing.

Unit V  

Brief introduction to Ada and features relevant to software engineering.

Text Books:  
MCS 203 DATABASE MANAGEMENT SYSTEM (ORACLE- BASED)

Unit I
Introduction to E-R Model & Relational Algebra: Introduction, advantage of DBMS approach, various views of data, data independence, schema & sub-schema, primary concept of data models, Data base languages, Database Administrator & users, Data dictionary, Overall System architecture. E-R Model: basic concept, design issues, mapping constraints, keys, ER-diagram, weak and strong entity sets, specialization & generalization, aggregation, design of ER Schema to tables.

Unit II
Relational Model: domains, relations, relational databases, various types of keys (super, candidate, primary, alternate, secondary, foreign keys), structure of Relational Algebra, Relational Algebra with extended operations, modifications of databases, idea of relational calculus.

Unit III
SQL, Functional Dependencies & Normalization: basic structure of SQL, set operations, aggregate functions, null values, nested sub-queries, views, modification of databases, join relations, DDL, DML. Assertion and Triggers: basic definitions, trivial and non trivial dependencies, closure set of dependencies & of attributes, canonical cover. Introductions to normalization: loss less and lossy decomposition, First, second and third normal forms, dependency preservation, BCNF, multi-valued dependencies and fourth normal form, join dependencies and fifth normal form.

Unit IV
Transactions, Concurrency & Distributed Databases: basic concept of transaction, ACID properties, transaction state, concurrent executions, basic idea of serializability, basic idea of concurrency control, basic idea of deadlock, failure classification, data access. Recovery & Atomicity -log based recovery, deferred database modification, immediate database modification, check points. Distributed Databases: basic idea, distributed data storage, data replication, data fragmentation (horizontal, vertical & mixed).

Unit V

Text Book:
2. Oracle & The complete reference by Koch & Loney, Oracle Press.

Reference Books:
1. An Introduction to Database System by C.J. Date (6th edition) Addison Wesley.
2. An Introduction to Database System by B.C. Desai, Galgotia Publication.
4. Database Management System by Alexix Leon Mathews Leon
5. Oracle 8 The complete reference by Koch & Loney, Oracle Press.
MCS 204

Computer Networks

Unit-I

Unit-II
Transmission media, Error detection, parity check codes, CRC, Hamming code. Data Link Protocols Stop and wait protocol, Noise free and noisy channels, Sliding window protocol (Go Back n ARQ, Selective Reject ARQ), HDLC data link protocol, Asynchronous transfer mode (ATM): ATM cells, header and cell formats, layers in ATM, class 1,2,3,4, traffic.

Unit-III
Random Access Data Networks: Concept of Random access, pure ALOHA, slotted ALOHA. Local Area Networks: IEEE 802.3, 802.4 and 802.5 protocols, FDDI protocol.

Unit-IV

Unit-V
Presentation and Application Layer protocols: presentation concepts, SNMP, Abstract syntax Notation 1 (ASN 1), Cryptography: substitution and transposition ciphers, DES, DES Chain, Breaking DES, Public Key Cryptography, authentication protocols, electronic mail.

TextBooks:-
1. A.S. Tanenbaum "Computer Networks" PHI
2. Data Communication and Networking : Behrouz A. Frozen

Reference Books:-
1. J.F. Hayes "Modelling and Analysis Computer Communication Networks"
3. D.E. Comer "Internetworking with TCP/IP" PHI.
5. W. Stallings "Data & computer communication" Maxwell International