

Third Semester

BCA- S301: Database Management Systems

UNIT-I

Introduction: Purpose of the data base system, data abstraction, data model, data independence, data definition language, data manipulation language, data base administrator, data base users, overall structure.

ER Model: entities, mapping constrains, keys, E-R diagram, reduction E-R diagrams to tables, generation, aggregation, design of an E-R database scheme.

UNIT-II

Relational Model: The catalog, base tables and views. Relational Data Objects - Domains and Relations: Domains, relations, kinds of relations, relations and predicates, relational databases.

Relational Data Integrity - Candidate keys and related matters: Candidate keys. Primary and alternate keys. Foreign keys, foreign key rules, nulls. Candidate keys and nulls, foreign key and nulls.

UNIT-III

The SQL Language: Data definition, retrieval and update operations. Table, expressions conditional expressions, embedded SQL.

Views: Introduction, what are views for, data definition, data manipulation, SQL support.

UNIT-IV

Network model: basic concepts, data structure diagrams, DBTG CODASYL model, DBTG data retrieval facility, DBTG update facility, DBTG set processing facility, mapping networks to file, networks system.

Hierarchical model: basic concepts, tree structure diagrams, data retrieval facility, update facility, virtual records, mapping hierarchical to files, hierarchical system.

UNIT-V

File and system structure : overall system structure, file organization, logical and physical file organization, sequential and random, hierarchical, inverted, nulllist, indexing and hashing, B-tree index files.

Recommended Books

1. Date C.J., Database Systems, Addison Wesley.
2. Korth, Database Systems Concepts, McGraw Hill.

BCA-S302: Data Structures using C

UNIT-I

Linear Structure: Arrays, records, stack, operation on stack, implementation of stack as an array, queue, operations on queue, implementation of queue.

UNIT-II

Linked Structure : List representation, operations on linked list - get node and free node operation, implementing the list operation, inserting into an ordered linked list, deleting, circular linked list, doubly linked list.

UNIT-III

Tree Structure: Binary search tree, inserting, deleting and searching into binary search tree, implementing the insert, search and delete algorithms, tree traversals

UNIT-IV

Graph Structure: Graph representation - Adjacency matrix, adjacency list, adjacency multilist representation. Orthogonal representation of graph . Graph traversals - bfs and dfs. Shortest path, all pairs of shortest paths, transitive closure, reflexive transitive closure.

UNIT-V

Searching and sorting : Searching - sequential searching, binary searching, hashing. Sorting - selection sort, bubble sort, quick sort, heap sort, merge sort, and insertion sort, efficiency considerations.

Recommended Books

1. Horowitz E Sartaj Sahni, Fundamentals of Data Structure, Galgotia Publication Private Limited., New Delhi.

BCA-S303: Computer Networks

UNIT-I

Protocol Architecture: Overview: Communication model, Communication Tasks, Data Communication Networking: WAN, LAN, Wireless Networks. Basics of Network Software: Protocol and protocol architecture, Protocol functions, Design Issues for the layers, interfaces & Services, Connection oriented and connectionless services, service primitives, relationship of services to protocols, ISO REF Models, TCP/IP Model.

Data Communications: Data Transmission: Concepts of Frequency, Spectrum, bandwidth, Electromagnetic spectrum and frequencies for data communication, Fourier analysis, Data and signal, Transmission impairments, channel capacity, Nyquist bandwidth, Shannon capacity formula, decibels and signal strength, Transmission media: Coaxial, twisted pair, Comparative study of Categories of cables, Coaxial, Optical Fibers, Wireless transmission: Terrestrial Microwave, satellite, Broadcast Radio, Infrared,.

UNIT-II

Data Encoding: (Brief idea of NRZ, Bipolar AMI, B8ZS, HDB3, ASK, FSK, PSK, PCM, AM, FM, PM), Spread Spectrum. Asynchronous and Synchronous transmission, Full and Half duplex, Interfacing, Functional and Procedural aspects of V.24,

Data Link Control: Flow control: Stop and Wait, Sliding window, Error detection: Parity Check, CRC. Error control: Stop and Wait ARQ, Go back-N ARQ, Selective-Reject ARQ, Brief idea of HDLC and other Data Link control protocols

UNIT-III

Circuit Switching: Simple switching Network, Circuit Switching Networks, Brief idea of following (detail working) not required:

Circuit Switching Concepts: Space Division switching, Time Division Multiplexing, Routing in circuit switching Networks, Control Signalling, Inchannel & common channel signaling, brief idea of SS7. Packet Switching: Packet switching principles, Routing, X.25

UNIT-IV

LAN Technology: LAN architecture, IEEE 802 standards, Ethernet (CSMA/CD): Medium Access Control, 10Mbps, 100Mbps, Gigabit Ethernet. Brief survey of other LAN systems (Token ring, FDDI, ATM, Fiber channel). Wireless LANs, Bridges, Latest trends in LAN technologies
LAN Devices: Study of specifications of L2 and L3 switches, Structured cabling, passive components.

UNIT-V

Principles of Internetworking, connection less Internetworking, IP, IPv6, IP multicasting. Routing protocols, TCP, UDP, SNMP, SMTP and MIME, HTTP.

Recommended Books:

1. William Stallings: Data & Communications, Sixth Edition
2. A. S. Tanenbaum: Computer Networks\\

BCA -S304A: Business Organization and Management

UNIT – I

Business and Management: Business Meaning and Contents, Business as a system, Business Environment. Management Concept and Nature, Management Process, Basic function of Management, Management Level, Role of Manager, Management Principles (Henry fayol's principle of management, Taylor's Scientific Management) .

UNIT – II

Organizational Behaviour: Need of Understanding human behaviour in organization, Challenges and Opportunities for OB.
Management by Objective (MBO), Decision making process and models, Conflict Management, Strategies & Policies.

UNIT- III

Managing Personnel: HRM- Meaning and Functions, Man Power Planning, Job Analysis and Design, Training, Career Planning & Development.
Motivation Theories & Practices, Leadership Concept theories & Style, Compensation Management.

UNIT- IV

Marketing Management and Finance: Basic Concepts of Marketing, Nature & Scope of Marketing, Sales Promotion, Product Life Cycle, Marketing Information System (MIS) and Marketing Research.
Main Sources of Finance, Concept of Fixed & Working Capital, Introduction of Tax – Income Tax, Service Tax & VAT, Basic Concept of Invoice & Quotations.

UNIT- V

Case Study: IT & BPO Industry, HR & Finance, Case Study of Local Industry with around Hundred Employees,
Industry Visit, Project.

Recommended Books:

1. B.P. Singh & T.N. Chhabra, "Business Organization and Management Functions", Dhanpat Rai & Co. 2000.
2. P.C Tripathi & P. N. Reddy, "Principles of Management", Tata McGraw Hill Publishing Company New Delhi.
3. L.M. Prasad, "Principles and Practices of Management".
4. Stephen P. Robbins, "Organizational Behaviour", (8th Ed.) Prentice Hall of India.
5. K. Aswathappa, "Human Resource Management", Tata McGraw Hill Publishing Company New Delhi.
6. Philip Kotler, "Marketing Management", (9th Ed.) Prentice Hall of India.
7. Ramaswamy. V.S. and Namakumari.S. "Marketing Management: Planning, Control." New Delhi, MacMillan. 1990.
8. Dr. S.N. Maheshwari, "Financial Management – Principles and Practices" (6th revised Ed.) S. Chand & Sons.

BCA- S304B: Numerical and Statistical Methods

UNIT-I

Roots of Equations: Graphical Method -Bisection Method - False-Position Method - Fixed-Point Iteration - Newton-Raphson Method Secant Method - Roots of Polynomials: Conventional Methods - Muller's Method - Bairstow's Method. Algebraic Equations: Gauss Elimination -Gauss-Jordan - LU Decomposition - Matrix Inverse -Gauss-Seidel.

UNIT-II

Numerical Differentiation - Integration: Trapezoidal Rule - Simpson's Rule - Romberg Integration - Differential equations: Taylor's method - Euler's method -Runge-Kutta 2nd and 4th order methods Predictor - corrector methods.

UNIT-III

Diagrammatic and Graphical representation of Numerical Data - Formation of frequency distribution - Histogram, Cumulative Frequency - Polygon and Ogives - Measures of central tendencies - Mean, Median, Mode - Measures of dispersion - Mean deviation, Standard deviation, variance, Quartile deviation and coefficient of variation - Moments (upto 4th) - Measures of Skewness and Kurtosis for grouped and ungrouped data.

UNIT-IV

Sample space - Events - Definition of probability - combinatorial problems - conditional probability and independence - Random variables, distributions and Mathematical expectations - Discrete distributions - Binomial - Poisson - Continuous distributions - Normal and Exponential distributions - Moments and Moment generating functions.

UNIT-V

Correlation and Regression analysis: product moment correlation -coefficient - rank correlation coefficient - simple regression - method of least squares for estimation of regression coefficient. Concept of sampling and Sampling distributions - Sampling from Normal distributions - Standard error - Tests of significance - Large sample test for population mean and proportions - Test for populations means: single - two sample and paired t - test - Chi square tests for goodness of fit and test for independence of attributes in contingency table.

Recommended Books:

1. Snedecor G.W. and Cochran W.G. (1989): Statistical methods, 8 ed., Affiliated East West.
2. Trivedi K.S. (1994): Probability and Statistics with Reliability, Queueing and computer Science applications, Prentice Hall of India.
3. Balaguruswamy E. (1988): Computer oriented Statistical and Numerical methods, Macmillan India Ltd.
4. S. C. Chopra and R. P.Canale - Numerical Methods for Engineers - Third Edition - McGraw Hill International Edition - 1998.
5. S. S. Sastri, Introductory Methods of Numerical Analysis, Prentice Hall

PRACTICAL

BCA- S305: Programming Lab

Practicals based on paper BCA- S302

BCA-S306: Database Lab

Practicals based on paper BCA - S301

AUDIT COURSE:

BCA- S307A/BCA-S307B: Elective Practical Laboratory for proficiency in any one of the following

- 1 .Web Design
2. Desk Top Publishing

BCA-S308: Seminar: Seminar topics to be allotted in the beginning of the course by issuing schedule of seminars including faculty seminars