

BCA III SEMESTER

CODE	SUBJECT	MARKS		
		Internal	External	Total
BCA-31	Database Management System	25	75	100
BCA-32	Object Oriented Programming With C ++	25	75	100
BCA-33	System Analysis and Design	25	75	100
BCA-34	Data Communication and Networks	25	75	100
BCA-35	Database Management System Lab.	25	75	100
BCA-36	Object Oriented Programming With C++ Lab.	25	75	100
				600

BCA-31 DATA BASE MANAGEMENT SYSTEM

UNIT I

Introduction to Database Management System (DBMS): Database Concepts, Why database, characteristics of data in database, Advantages of DBMS, **Overview of Database Models:** Hierarchical Model, Network Model, Relational Model and Object Oriented Model. Three levels of Database Architecture: Conceptual, Physical and Logical levels. **Entity Relationship Model:** Entity, Attributes, Relationships, E-R Modeling Symbols

UNIT II

Relational DBMS: RDBMS Terminology, Relational Data Structure, Data Integrity, Codd's Rule, Overview of Relational Algebra and Relational Calculus, Relational Database Design: Primary Keys, Foreign Keys, Candidate Keys, Relationships, Normalization, Purpose of Normalization, First Normal Form, Second Normal Form, Third Normal Form

UNIT III

SQL: SQL Data Types and Literals, DDL, DML, DQL, DCL, DAS, TCS, SQL operators, Creating Database, Creating, Modifying and Deleting Tables, Creating View, Indexes, Queries: Insert, Select, Update, Where Clause, Having Clause, Sub-Queries, Order By, Grouping, Creating Variables, Functions: Aggregate and Scalar, Joins, Unions, Triggers, Procedures

UNIT IV

Transactions: Transaction concept, Transaction Properties, Transaction States, **Concurrency Control:** Concurrency Control Schemes - Lock Based Protocols, Timestamp Based Protocols, Deadlock handling, User Defined Transactions

UNIT V

Database Security: Data Security Risks, Data security requirements, Database Users, Database Backup, **Database Recovery:** Types of database Failures, Recovery Techniques - Deferred Update, Immediate Update and Shadow paging, Database Privileges - System Privileges and Object Privileges, Overview of Data Storage Devices

Text Books:

1. A, Leon and M. Leon, "Database Management Systems"
2. R, Elmasri, S. Navathe, " Fundamentals of Database System",

Reference Books :

1. H. Korth, A. Siilberschatz, "Database System Concepts-"
2. P. Battachar and A.K. Majumdar : "Database Management System P. Bhattacharya".

BCA-32 OBJECT ORIENTED PROGRAMMING WITH C++

UNIT I

Basic concepts of Object Oriented Programming, Benefits of OOP, Applications of OOP. Data types: Basic data types, User Defined data types, Derived data types, symbolic constant, reference variable, Operators in C++, Manipulators, Type cast operators

UNIT II

Control Structures: if, if-else, else-if ladder, switch statements. Loops: for, while and do-while statements, Break, continue, goto statements. **Functions:** functions prototyping, call by value, call by reference, inline functions, default arguments, function overloading, friend and virtual function

UNIT III

Classes and Objects: specify a class, defining member functions, arrays within a class, array of objects, friend function, **constructors and destructors**, **Operator Overloading:** Overloading unary operators, Overloading binary operators, overloading binary operators using friends, manipulation of strings using operators

UNIT IV

Inheritance: defining derived classes, single inheritance, multilevel inheritance, multiple inheritance, Hierarchical inheritance, hybrid inheritance, virtual base classes, abstract classes, **Pointers:** Pointers to objects, this pointer, **virtual functions**

UNIT V

Working with Files: Opening and closing a file, sequential input and output operations, command line arguments, **Templates:** class template, function template. **Exception Handling:** exception handling mechanism, specifying exceptions

Main Text Books :

1. Robert Lafore : Object Oriented Programming in C++
2. OOP with C++ : Balagurusami
3. Let us C++ : Y Kanetkar

Reference Books :

Stroustrup, B : The C++ programming Language- Addison Wesley, 1988.

BCA-33 SYSTEM ANALYSIS AND DESIGN

UNIT I

Introduction: System Definition and Concepts, characteristics of a system, elements of a system, types of systems: Physical or abstract systems, open or closed systems, formal and informal information systems, Computer Based Information System, Management Information System, Decision Support System; Introduction to System Development Life Cycle (SDLC); Role of System Analyst

UNIT II

System Analysis: Bases for Planning in system analysis, initial investigation, Information Gathering tools: on site observation, interviews and questionnaires; Tools of structured analysis: Data flow diagram (DFD), data dictionary, decision tables, decision trees and structured English

UNIT III

Feasibility study: System performances, feasibility considerations, steps in feasibility analysis, feasibility report, cost / benefit **analysis:** data analysis, cost and benefit categories, procedure for cost / benefit determination

UNIT IV

System Design: the process of design, design methodologies: structured design, form driven methodology; Major Development activities, audit consideration, **Input / Output and Form Design:** input design, output design, forms design

UNIT V

System Implementation: the test plan, quality assurance, conversion, post implementation review, software maintenance, procedure for hardware / software selection, project management, planning tools, project organization, system security, disaster / recovery planning, ethics in system development

Main Text Book :

Elias M Awad : System Analysis and Design.

Reference Books :

1. Henry Lucas Jr. : The Analysis, Design and Implementation of Information System.
2. Whiten, Bently & Barlow: System Analysis and Design.

BCA-34 DATA COMMUNICATION AND NETWORKS

UNIT I

Fundamentals of Data Communication: Introduction, Communication Systems, Channel Characteristics, Transmission modes, Synchronous and asynchronous transmission. **Transmission Media** - Guided Media (Twisted pair, Co-axial cable, and Optical fiber), Unguided Media (Radio, VHF, microwave, satellite), Infrared Transmission, Fiber Optics Communication: Components (Source, Channels Detector)

UNIT II

Data Modems: Concepts of Modulation, Pulse Code Modulation, Shift Keying [ASK, FSK, PSK, QPSK, DPSK], Encoding techniques and CODEC, Classification of Modems, Modem Standards and Protocols, Establishing a connection. **Multichannel Data Communication:** Circuits, channels and multichanneling, Multiplexing [FDM, TDM, CDM, WDM], Access Techniques [FDMA, TDMA, Spread Spectrum Techniques and CDMA], Digital Hierarchies [SONET / SDH]. **Networking Fundamentals:** Switching techniques: Circuit Switching, Packet switching, Message switching, Datagram, Virtual circuit, Connectionless and connection oriented communication, Cell switching (ATM). Network Topologies: Bus, Star and Ring

UNIT III

OSI Model and TCP/IP Suite: Network architectures, Layering the communication process, Open Systems Interconnection (OSI) model, TCP / IP protocol, Data transmission by TCP and Ethernet, Data Encapsulation, Data routing, An Error Reporting Mechanism-The Internet Control Message Protocol (ICMP), User Datagram Protocol (UDP), TCP/IP services and application protocol, Internet Architecture. **Data Link Protocols:** Protocol, Transmission Control Procedure, Character Oriented Protocols (COP), Bit Oriented Protocols (BOP), Transmission Control Procedure Types

UNIT IV

Local Area Network (LAN): Baseband versus Broadband, Media access control, LAN hardware, LAN Operating System, Extending LAN - Fiber Optic Extension, Repeaters, Bridges, Router, Gateways, Switch, Hubs, Virtual LANs. **Wide Area Network (WAN)** - Using WAN and network services, Router concepts, Communication protocols over WAN

UNIT V

Data Transmission Network: Telephone networks: Dial-up Telephone networks, Leased Line. X.25. The Integrated Services Digital Network (ISDN): Narrow band ISDN, Broadband ISDN Service, Frame Relay, Congestion Control, Cell Relay, ATM Structure. **Wireless Communication** - Cellular Radio, Telephony (GSM), VSAT, **Security and Privacy** - Network Security, firewall, VPN

Text Book:

1. Data Communication and Computer Networks Dr. Jain, Satish Jain

Reference Books:

1. Computer Communication & Networks Andrew S. Tanenbaum