

# BCA- PART II

## Syllabus for BCA 201- DATA STRUCTURE (2011-12)

### Unit-I

- ✓ Primitive and Composite Data Types
- ✓ Time and Space Complexity of algorithms
- ✓ Stack and Primitive operations on stack, Application of stack :- Infix, Postfix, Prefix and Recursion.
- ✓ Queues, Primitive operations on Queues, Circular Queue, De Queue and Priority Queue.

### Unit-II

- ✓ Link-List: Basic operation on linked list, Circular linked list, Doubly linked list, Linked representation of Stack and Queue, Application of Linked lists.

### Unit-III

- ✓ Tree: Basic Terminology, Binary Trees, Tree representation as Array and Linked list, Basic operations on Binary trees, Traversal of binary tree :- In-Order, Pre-Order, Post-Order. Application of Binary tree, Threaded Binary Tree, B-Tree and Height-Balance Tree.

### Unit-IV

- ✓ Sequential Search, Binary Search.
- ✓ Insertion Sort, Selection Sort, Quick Sort, Bubble Sort, Heap Sort, Comparison of Sorting methods.

### Unit-V

- ✓ Hash table, Collision Resolution Techniques
- ✓ Introduction to Graphs: Definition, Terminology, Directed, Undirected, Weighted graph, Representation of graphs. Graph Traversals- Depth First and Breadth first. Spanning Trees, Minimum Spanning Trees, shortest path algorithms.

### References:

1. Expert Data Structure with 'C' By R.B. Patel (Khanna Book Pub.)
2. Data Structure By Lipschutz (Tata McGraw Hill)
3. Data Structure By Yashwant Kanetkar (BPB)
4. An Introduction to Data Structure with Applications, By Jean-Paul Tremblay, Paul G. Sareson (Tata McGraw Hill).

# BCA- PART II

## Syllabus for BCA 202- OOPS With C++ (2011-12)

### Unit-I

Object oriented programming, introduction to C++ classes. Classes and objects: structure and classes, union and classes, Inline functions, scope resolution operator. Static class members :- static data members, static member functions, Array, pointers, references and dynamic allocation. Array of objects, passing objects to function, returning objects, object assignment, friend function and friend class.

### Unit-II

Constructors and destructors: Parameterized constructors, multiple constructors in a class, Constructors with default arguments, Copy constructor, Dynamic constructors, Destructors. Pointers to object, this pointer, pointers to derived classes, Virtual Functions, Pure virtual functions.

### Unit-III

Function and operator overloading: definition, overloading unary and binary operators, overloading binary operators using friends, manipulation of strings using operators, type conversions.

### Unit-IV

Inheritance: Defining derived class, single inheritance, multilevel inheritance, hierarchical inheritance, hybrid inheritance, virtual base class, abstract base class, constructor in derived class, nesting of classes, templates.

### Unit-V

The C++ I/O system, basics of C+ streams, the basic stream classes: C++ predefined streams, formatted console I/O operations using the ios members, setting the format flags, clearing format tags, an overloaded form to self( ), examining the formatted flags, setting all flags, using width( ), precision( ), and fill( ). Using manipulators to format I/O, creating your own manipulators. File I/O-files stream classes, opening and closing a file, reading and writing text files, binary files I/O- Get( ) and Put( ), Read( ) and write( ), More get( ) function, peek( ) and Putback( ), flash( ), random access, obtaining the current file position, I/O status- customized I/O files.

### References:

1. Object Oriented programming with C++, By E. Balagurusamy (Tata Mcgraw Hill)
2. C++ The Complete Reference, By Herbert Schildt (Tata McGraw Hill)
3. Object Oriented Programming with C++, Schaum Series (Tata McGraw Hill)

# BCA- PART II

## Syllabus for BCA 203- COMPUTER NETWORKS (2011-12)

### Unit-I

Need and Advantages of Networking, Network topology, transmission mode, Network categories :- LAN, MAN & WAN. Network Protocols- Hardware and Software Protocols, Digital and Analog Signal, encoding and modulating: digital to digital, analog to digital, digital to analog, analog to analog.

### Unit-II

Transmission media :- guided & unguided media, Guided Media:- Twisted Pair, Coaxial cable, optical fiber; Unguided media :- Radio frequency Allocation, Propagation of Radio waves, Terrestrial Microwaves, satellite Communication. Transmission media performance and properties, comparative study. Transmission Impairments: Attenuation, Distortion & Noise, Switching :- Circuit, Packet and Message Switching.

### Unit-III

OSI an IEEE 802 Model, Ethernet- Working principle, 10 and 100 Mbps Ethernet, Token Ring, FDDI, Comparison, Data Link Control :- Flow Control: Stop and wait, Sliding Window. Error Control: Automatic Repeat Request (ARQ), Stop and Wait ARQ, Sliding window ARQ, Data link control protocol: Asynchronous, synchronous, bit oriented and character oriented.

### Unit-IV

Transport layer: Duties of transport layer, connection, the OSI transport protocol, Network Technologies :- Fiber channel, ATM, SONET: Physical configuration, SONET Layers, SONET Frames and Applications. Network Connectivity :- Hubs, Repeaters, Bridges, Multiplexer. Internet Connectivity :- Router, Gateway, CSUs/DSUs. Modem : Transmission Rate and Modem Standards.

### Unit-V

Internet – Overview of TCP/IP, IP addressing, Subnetting, Masking , IPv6, Comparison of IPv4 and IPv6, Network Security :- Privacy, Authentication, Integrity & Non-Repudiation, Firewall :- Benefit & type of firewall. Cellular Telephony- Frequency Reuse Principal, Transmission, Receiving, Handoff, Roaming, First Generation, Second Generation, Third Generation.

### References:

1. MCSE: Networking Essentials Study guide by James Chellis (BPB).
2. Data Communication and Networking By Behrouza Forouzon (Tata McGraw Hill, Edition 2004).
3. Data and Computer Communication by William Stallings, Pearson Edition

# BCA- PART II

## Syllabus for BCA 204- OPERATING SYSTEM (2011-12)

### Unit-I

Introduction to Operating System: Time-Sharing, Parallel, Distributed, Real Time Systems. System Calls, System Programs, Process Concepts, Process Scheduling, Scheduling Criteria, Scheduling Algorithms.

### Unit-II

Dead Lock: Characteristics, Method for handling Dead locks, Prevention, Avoidance, Detection and Recovery, Memory Management- Swapping, Paging- Page Replace Algorithm, Virtual memory.

### Unit-III

Disk Structures, Disk Scheduling, Disk Management, Disk Security, Distributed System Structures- Network Operating System, Distributed Operating System. Semaphore, Monitors.

### Unit-IV

UNIX/LINUX: Introduction File System, File and Directory Structure, Inode and Block Storage. UNIX/LINUX commands, File Permission, File Related Commands, Shell and Kernel. Process- Init, Getty and Login Process; Killing, Changing Priority. Partitioning the Hard drive for Linux, Installing the Linux System, System administration: Managing user accounts- adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, creating and mounting file system, checking and monitoring system performance, file security & Permissions, becoming super user using su. Getting system information with uname, hostname. Backup and restore files, installing and removing packages with yum rpm command. VI editor.

### Unit-V

Shell Script: Variables, File Name Expansions, Shell Commands, Looping and Making Decisions. MySql with LINUX, Managing Database and Tables.

### References:

1. Operating System Principles, By Abraham Silverschatz, Peter Galvin (John Wiley & Sons Inc.)
2. Operating System concepts and design, By Milan Milen Kovic (Tata Mcgraw Hill)
3. Teach Yourself UNIX, By Kevin Reichard, Eric F Johnson (BPB)
4. Using UNIX, By Philip Laplante (Jaico Publishing House)
5. UNIX concepts, By yashwant kanetkar (BPB Publication)

## BCA- PART II

### Syllabus for BCA 205- DISCRETE MATHEMATICS (2011-12)

#### Unit-I

Statements (Propositions), Logical Operations, Truth Table, Tautologies, Contradiction, Logical Equivalence, Algebra of Propositions, Conditional and Bi-Conditional Statement, Argument, Logical Implication, Propositional Functions, Quantifiers, Negation of Quantifiers Statements, Normal Forms.

#### Unit-II

Integers: Properties of Integers, Order and inequalities, Absolute value, Mathematical Induction, Division Algorithm, Divisibility, Primes, Greatest Common Divisor (GCD), Euclidean Algorithm, Fundamental Theorem of Arithmetic, Congruence Relation.

#### Unit-III

Set Theory: Sets and elements, Universal and empty set, subset, finite and infinite sets, power sets, partitions. Class of sets, Venn diagram, set operations, Algebra of sets, Duality Relations- Composition of relations, Type of Relation, closure Properties, Equivalence Relations, Partial Ordering Relation.

#### Unit-IV

Boolean Algebra, Introduction, Basic Definition, Duality, Basic Theorems, Boolean Algebra as Lattices, Representation Theorem, Sum-Of-Products Form for Sets and for Boolean Algebra, Logic Gates and Circuits, Truth Table.

#### Unit-V

Graph Theory, Graphs and Multi Graphs, Sub Graphs, Isomorphic and Homeomorphism Graphs, Paths, Connectivity, Various Type of Graphs, Graph Coloring, Representation of Graphs in Computer Memory. Shortest Path Algorithm, Graph Traversal Algorithm (Depth First Search, Breadth First Search).

#### References:

1. Discrete Mathematics, Schaum's Series By Seymour LipSchutz, Marc Lipson (Tata McGraw Hill)
2. Discrete Mathematics By Vinay Kumar (BPB).
3. Discrete Mathematical Structure By Dr. K.C. Jain & Dr. M.L. Rawat.

## BCA- PART II

Syllabus for BCA 206- ADVANCED DATABASE MANAGEMENT SYSTEM (2011-12)

### Unit-I

File Organization, Indexing and Hashing: Overview of file organization, techniques, Secondary Storage Devices, Operations in files, Heap files and sorted files, Indexing and Hashing- Basic Concepts: Static Hashing, Dynamic Hashing and Extendible Hashing, Ordered Indices, Types of single level ordered index, Other types of indexes.

Multi-Level Indexes: B-tree Index Files, B+ Tree Index Files, Bitmap Index, Hash Index, RAID technology, Buffer Management.

### Unit-II

Recovery: Reliability, Transactions, Reflecting UPDATE to the database and Recovery. Buffer management, Virtual Memory and Recovery, Disaster Recovery.

Concurrency Management: Serializability, Concurrency control, Locking Scheme. Dead Lock and its Resolution, Atomicity, Concurrency and Recovery. Database Security and Integrity: Security and Integrity threats, Defense mechanism.

### Unit-III

Introduction to PL/SQL, Advantages, Character Set, Data Types, Control Structure, Transaction, Cursor, Locks, Error Handling, Procedure and Functions, Triggers

### Unit-IV

Distributed Database Management Systems: Components, levels of data & process distribution, transparency features, data fragmentation, data replication.

Client Server Systems: Principles, Components, ODBC, ADO, JDBC and JSQL overview.

### Unit-V

Concept of Object Oriented Database Management System: Complex Data Types, Structured Types and Inheritance in SQL, Array and Multiset Types in SQL, Object Identify and Reference Types in SQL.

Data Mining and Data Warehousing: Decision Support System, Data Analysis and OLAP, Types of OLAP servers, Data Mining, Data Warehousing.

Data Warehousing Architecture: Concept of Multidimensional Data Model, 3-Tier Data Warehouse Architecture.

### References:

1. Database Management System: Korth, Tata McGraw Hill Publishing
2. An Introduction to Database System By Bipin C. Desai (Galgotia Publication).
3. SQL, PL/SQL Programming By Ivan Bayross (BPB).