# Barkatullah University, Bhopal
# Semester-Wise Scheme for BCA

Session 2009-10 onwards

**Paper Code: BCA301** **Semester III**

## OBJECT ORIENTED PROGRAMMING Using C++

Max Marks: 35

### UNIT I

Principles of OOP, procedure oriented programming vs. object oriented programming, basic concepts, advantages, application of OOPs, object oriented languages.

Beginning with C++: What is C++, structure of C++ program, creating, compiling, linking & executing a C++ program, Tokens, expressions & control structures, keywords, identifiers, basic data types, user-defined data types, derived data types, symbolic constants, type compatibility, variable declaration, dynamic initialization of variables, reference variables.

### UNIT II

Operators in C++: scope resolution operator, memory management operators, manipulators, type cast operators, operators, operator precedence, control structures.

Functions in C++: Main function, function prototyping, call by reference vs. call by value, inline functions, default arguments, const arguments, function overloading, friend functions.

Classes and objects: specifying a class, defining member functions, making an outside functions inline, private member function; array within a class, memory allocation for object; static data members, static member functions, array of objects, objects as function arguments, returning objects.

### UNIT III

Constructors and Destructors: Constructors, Parametric Constructors, Multiple Constructors in a class, constructors with default arguments. Dynamic initialization of objects, copy constructors, dynamic constructors, destructors.

Operator Overloading & Type Conversions: Definition of Overloading, & Operator Overloading, rules for Overloading Operators, Overloading Unary Operators, Binary Operators, Binary Operators using Friends.

### UNIT IV

Inheritance: defining derived classes, single inheritance, multilevel inheritance, multiple inheritance, hierarchical inheritance, hybrid inheritance, virtual base class, abstract classes, constructors in derived classes, member class, nesting of class.

### UNIT V

Pointers, virtual functions and polymorphism, pointers to objects, this pointer, pointers to derived class, pure virtual functions, exception handling in C++, managing console I/O operations, working with files :open, close, basic read-write operations on files .

**TEXT BOOKS** :

1. Object Oriented Programming with C++ by E Balagurusamy.

**REFERENCE BOOKS** :

1. Programming in C++ by Robert Lafore
2. C++ - The complete Reference – by Herbert Schildt (TMH)
3. Programming with C++, Schaum Series
4. OOP's concepts – by David Parsson.

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Session 2009-10 onwards

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## Database Management and Design

Max Marks: 35

**UNIT 1**

Basic Concepts of Data File system, its advantages and disadvantages.

**Concepts of DBMS:** Data, Information, Database, Components of DBMS, Architecture of a database system – Physical, Conceptual and User level, Data Independence – Logical and Physical, DBMS terminology, Data Dictionary.

**Database Models:** Network, Hierarchical and Relational Models, Features and Comparison of the three models. Concepts of Multitier Architecture in databases, Brief idea about the new concepts like distributed databases, parallel databases, mobile databases, temporal databases, spatial databases, geographic databases, data warehousing & data mining.

**UNIT 2**

**RDBMS:** Definition, Components, Terminology, Difference with DBMS. ER-Model, ER-Diagram, ER-concepts, types of relationships. Codd's 12 rules, **Normalization:** Introduction, concepts associated with normalization, key terminology: primary, candidate, foreign, alternate keys. Steps involved in normalization, $1^{st}$, $2^{nd}$, $3^{rd}$, $4^{th}$ normal forms, BCNF, $5^{th}$ normal form.

**UNIT 3**

Idea about Generalization, Aggregation, Specialization.

**Relational Algebra:** Formal Definition, Fundamental Operations – select, project, union, set, difference, Cartesian product & rename, additional operations & extended operations. Concept of SQL sublanguages – DDL, DML, DCL, TCL, SCL etc., Embedded SQL. **Interactive SQL:** Invoking sql*plus. Oracle data types, two dimensional matrix creation, Modifying the structure of tables, dropping tables.

**UNIT 4**

DML commands: Insertion, updation, deletion operations, many faces of select command, data constraints, logical operators, range searching, pattern matching, oracle functions, use of Alias, grouping data from tables, manipulating dates in sql, joins, Sub-queries, indexes, views, sequences, roles, synonyms, use of savepoint, rollback, commit

commands, creating user accounts, granting permissions, revoking permissions. Concept of importing and exporting database files.

**UNIT 5**

**SQL:** Introduction, the SQL execution environment, the SQL syntax, block structure – declarative part, executable part, exception handling part, variable declaration using %type, %rowtype, if statements, looping structures, oracle transactions, cursors & its types, cursor attributes, nesting of cursors, parameterized cursors, error handling in SQL, locks.

**TEXT BOOKS:**


1. Database System Concepts – by Silberschatz, Korth, Sudarshan (Mc Graw Hill).
2. An Introduction to Database Systems – by Bipin Desai.
3. SQL, PL/SQL – The Programming language of Oracle – by Ivan Bayross (BPB).


**REFERENCE BOOKS:**


1. Introduction to Database Systems by C J Date (Pearsons Education).
2. SQL/PLSQL for Oracle by P.S.Deshpande (AWI).
3. ORACLE – The Complete Reference by Oracle Press (TMH).

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## Semester-Wise Scheme for BCA
## Session 2009-10 onwards

**Paper Code: BCA 303** **Semester III**

## ORGANISATIONAL BEHAVIOUR

Max Marks: 35

**UNIT I**

What is Psychology? Whom does the Psychologist observe? What does Psychologist observe? Where does the Psychologist observe?

**UNIT II**

Sensation & Perception, Feelings and Emotions, Learning and Thinking.( in so far as they are applicable to Industry), Personality, Definition & Theories, Assessing Personality.

**UNIT III**

An Overview of Transactional Analysis as a Tool for Measuring One's Own Awareness and of helping Interpersonal Relationship in an Organisation.
Theories of Organisation, Contingency Model and other Models of Organisation, Theories of Motivation. – Abraham Maslow, Herzerberg Mecleland.

**UNIT IV**

Group Dynamics, Structure, Process, Values of Groups, Role and Stature.
Theories of Leadership, Identifying Leadership Potential.

**UNIT V**

Communication: Process, Methods, Barriers and Usefulness.

**TEXT & REFERENCE BOOKS:**


1. Organizational Behavior – by Robbins.
2. Organizational Behavior – by Luthans.
3. Organizational Behavior – by Sashi Gupta & Rozy Joshi.

**Barkatullah University, Bhopal**

# Semester-Wise Scheme for BCA

**Session 2009-10 onwards**

Paper Code: BCA304 Semester III

## OPERATING SYSTEM

Max Marks: 35

**UNIT I**

Operating System Definitions, its Components, Evolution of Operating System, types of operating systems: batch, multiprogrammed, multitasking, desktop, multiprocessor, real-time, client-server, peer-to-peer, distributed, clustered and handheld. Operating system services, dual-mode operation, protection of I/O, memory and CPU. Non-virtual and virtual machines.

**UNIT II**

Process Scheduling: concept of a process, process states, PCB, Process state transitions, operations on processes, context switch, types of schedulers, CPU scheduling concept, CPU Scheduler, CPU-I/O burst cycle, dispatcher, scheduling criteria, scheduling algorithms – FCFS, SJF, STRN, Round Robin, priority, multilevel queue and event driven (i.e., pre-emptive priority) scheduling algorithms, Performance evaluation of algorithms through deterministic modeling.

**UNIT III**

Memory Management Concepts: Address Binding, logical and physical address space, dynamic loading etc., Contiguous allocation methods – static & dynamic partitioned memory allocation. Concepts of fragmentation, swapping, relocation, compaction, protection, sharing. Segmentation.

Non–contiguous allocation methods – Paging: basic principle of operation, h/w support for paging, protection and sharing. Virtual memory: concept of demand paging, Page fault, page replacement algorithms – FIFO, LRU, OPT. Thrashing, Concept of Page fault frequency, prepaging, decision about minimum number of frames, page size etc.,

**UNIT IV**

File system implementation, Responsibilities of file management system, directory implementation as linear list/hash table, directory structure, disk organization, disk controller and driver, disk space management – contiguous allocation, non contiguous allocation – chaining and indexing, disk address translation. Idea about disk caching, disk mirroring. Disk scheduling algorithms. Disk management.

**UNIT V**

Device Management: I/O hardware, Techniques for device management. Dedicated devices, shared devices, virtual peripherals. Security & protection: Security threats and goals, penetration attempts, Security policies and mechanism, authentication, protection and access control. Interprocess communication, need for interprocess synchronization. Deadlocks – definition, avoidance, detection, prevention and recovery.

**TEXT BOOK:**

1. Operating System Concepts – by Silberschatz, Galvin and Gagne.

**REFERENCE BOOKS**:

1. Operating System Concepts and Design – by Milenkovic
2. Operating System – by Tanenbaum.
3. Operating System – by Peterson.