

BCA 3rd Semester

BCA-301 COMPUTER ORIENTED NUMERICAL ANALYSIS

Unit-I

Introduction: Numbers and their accuracy, Computer Arithmetic, Mathematical preliminaries, Errors and their Computation, General error formula, Error in a series approximation

Solution of Algebraic and Transcendental Equation:

Bisection Method, Iteration method, Method of false position, Newton-Raphson method, Methods of finding complex roots, Muller's method, Rate of convergence of Iterative methods, Polynomial equations.

Unit-II

Interpolation: Finite Differences, Difference tables, Polynomial Interpolation: Newton's forward and backward formula, Central Difference Formulae: Gauss forward and backward formula, Stirling's, Bessel's, Everett's formula. Interpolation with unequal intervals: Langrange's Interpolation, Newton Divided difference formula, Hermite's Interpolation,

Unit-III

Numerical Integration and Differentiation: Introduction, Numerical differentiation Numerical integration: Trapezoidal rule, Simpson's 1/3 and 3/8 rule, Boole's rule, Waddle's rule.

Unit-IV

Solution of differential Equations: Picard's Method, Euler's Method, Taylor's Method, Runge-Kutta Methods, Predictor Corrector Methods, Automatic Error Monitoring and Stability of solution

Unit-V

Statistical Computation: Frequency chart, Curve fitting by method of least squares, fitting of straight lines, polynomials, exponential curves etc, Data fitting with Cubic splines, Regression Analysis, Linear and Non linear Regression, Multiple regression, Statistical Quality Control methods.

References:

1. Rajaraman V, "Computer Oriented Numerical Methods", Pearson Education
2. Gerald & Whealey, "Applied Numerical Analyses", AW
3. Jain, Iyengar and Jain, "Numerical Methods for Scientific and Engineering Computations", New Age Int.
4. Grewal B S, "Numerical methods in Engineering and Science", Khanna Publishers, Delhi

BCA - 302: COMPUTER ORGANIZATION

UNIT: 1

Arithmetic For Computers: Introduction to number system, negative numbers, addition & subtraction, logical operation, constructing of A.L.U., Multiplication & division (with algorithms), floating point arithmetic.

UNIT: 2

Processor Design: Processor organization , information representation, Instruction format, Addressing Modes (Implied mode, immediate mode, register indirect mode, auto increment or Auto decrement mode, direct addressing mode, indirect addressing mode, relative addressing mode, Index Addressing mode), instruction types.

UNIT: 3

Memory Organization: Classification of memories (RAMs (Static & Dynamic), ROMs, PROMs, EPROMs, EEPROMs, Hard Disk, Floppy Disk and CD-ROM), Memory Hierarchy, Optimization of memory hierarchy, addressing scheme for main memory, segmented memory system, paged segment memory. High speed memories, Characteristics of Cache memory.

UNIT: 4

System Organization: Bus arbitration, Programmed I/O (IO addressing, IO instruction), DMA (Type & procedure), interrupts.

SUGGESTED READINGS:-

1. Computer System Architecture, By. M. Morris Mano, PHI.
2. Hamacher V.C., Viraesic Z.G. and Zaky S.G., "Computer Organization" Mc Graw Hill.
3. Computer Architecture and Organization , By John P. Hayes, McGraw Hill.
4. Computer Organization and Design, by John L. Hennessy & David A. Patterson, Morgan Kaufman.

BCA-303 DATA STRUCTURES

Unit - I

Introduction: Basic Terminology, Elementary Data Organization, Structure operations, Algorithm Complexity and Time-Space trade-off

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices and Vectors.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack. Recursion.

UNIT - II

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, dequeues and Priority Queues.

Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition.

UNIT – III

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree, Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

UNIT – IV

Sorting: Insertion Sort, Bubble Sorting, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST.

UNIT - V

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal.

SUGGESTED READINGS:

1. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., New Delhi.
2. R. Kruse et al, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi-2002
3. A. M. Tenenbaum, “Data Structures using C & C++”, Prentice-Hall of India Pvt. Ltd., New Delhi.

BCA-304: OBJECT ORIENTED PROGRAMMING USING C++

UNIT: 1

Object-Oriented Modeling and Design : Object Oriented Concepts, Objects and Classes, Characteristics of Objects Identity, abstraction, Classification, Polymorphism, Inheritance, Object Oriented Models, Object Model, dynamic Model, Functional Model, Links and Associations, Generalization, Grouping Constructs, Metadata, Object design, Other OOD Methodology as SA/SD, JSD.

UNIT: 2

Introduction to OOP: Advantages of OOP, Need of object-oriented programming, Procedure Oriented Vs Object Oriented Programming.

Introduction to C++ : C++ Programming Basics, Basic Program Construction of C++, Key words in C++, Input/Output in C++, Variables, Constants, Data Types and Operators in C++, Precedence of Operators, Storage Classes Arrays in C++.characteristics of object oriented languages, C++ and C.

UNIT: 3

Decision Making and Loops in C++ : Conditional statement, Switch Statement, Break Statement, Continue Statement, Go to Statement Loops in C++, While, Do-While, For loop.

UNIT: 4

Functions : User Defined Functions, library functions, General form of a function, scope rules of functions, function arguments(Call by value, Call by Reference), Recursion Calling Functions with arrays, Returning by reference, Friend Functions, Inline Functions, Structures and Unions in C++, Pointers in C++, Pointers with structure, Pointer with functions.

UNIT: 5

Objects and classes : Structure and Classes, Union and Class, friend classes, Scope resolution operator, specifying and using class and object, Constructors, objects and function arguments.

Inheritance: Base Class, Derived Class, access specifies Single Inheritance, Multiple Inheritance, Multilevel Inheritance.

Polymorphism: Compile time, Run time, Operator Overloading, Function Overloading, Virtual functions, Dynamic Binding, Static Binding

SUGGESTED READINGS:-

1. Herbert Schildt "The Complete Reference C++" TMH Publication.
2. E. Balaguruswami "Object Oriented Programming with C++" TMH Publication.
3. James Rumbaugh "Object Oriented Modeling and Design" Pearson Publication.

BCA-305 Organizational Behavior

UNIT: 1

Concept, Nature, Characteristics, Conceptual Foundations and Importance, Models of Organizational Behavior, Relationship with other fields.

UNIT: 2

Perception: Concept, Nature, Process, Importance. Management and Behavioural Applications of Perception. Attitude: Concept, Process and Importance. Personality: Concept, Nature, Types and Theories. Learning: Concept and Theories of Learning.

UNIT: 3

Motivation: Concepts and Their Application, Principles, Theories.

Leadership: Concept, Function, Style and Theories of Leadership- Trait, Behavioural and situational Theories.

UNIT: 4

Group Dynamics: Definition, Stages of Group Development, Group Cohesiveness, Formal and informal Groups, Group Processes and Decision Making, Dysfunctional Groups.

Conflict: Concept, Sources, Types, Functionality and Disfunctionality of Conflict, Classification of Conflict; Intra-Individual, Interpersonal, Inter-group and Organizational, Resolution of Conflict.

UNIT: 5

Organizational Power and Politics: Concept, sources of Power, distinction Between Power and Politics, Approaches to Power, Dysfunctional Uses of Power and politics.

SUGGESTED READING:-

1. Newstorm John W. – Organizational Behaviour : Human Behaviour at work(Tata Mc. Graw Hill, 12th Edition).
2. Luthans Fred- Organizational Behaviour(Tata Mc Graw hill)
3. Robbins Stephen P.- Organizational Behaviour(Pearson Education, 12th Edition)
4. Hersey Paul, Blanchard, Kenneth H and Jhonson Dewey E.- Management of Organizational Behavior : Leading Human Resources (Pearson Education)
5. Davis, Keith – Human Behaviour at works – Tata Mc Graw Hill, New Delhi.

BCA 4th Semester

BCA-401: OPERATING SYSTEM

UNIT: 1

Introduction: Operating system and function, the evolution of OS, Operating System services, OS Components.

Operating Systems Types: Batch, Time Sharing, Multiprogramming, Multitasking, Multiprocessor, Distributed, Real Time, Network.

UNIT: 2

CPU Scheduling: Process concept, Process state transitions, schedulers (long term, short term, mid term), Scheduling concept, Performance criteria, Scheduling algorithms, multiple processor scheduling.

UNIT: 3

Deadlocks: System model, Deadlock characterization, prevention, avoidance detection and recovery from deadlock.

UNIT: 4

Memory Management: Resident monitor, multiprogramming with fixed Partition, multiprogramming with variable partition, paging, segmentation, paged segmentation, virtual memory, demand paging, thrashing.

UNIT: 5

File System: File support, access methods, allocation methods (Contiguous, linked and index allocation), Directory system (Single level, tree structured, acyclic graph and general graph directory), file protection.

Disk Scheduling: FCFS, C-Scan etc.

SUGGESTED READINGS:-

1. . Peterson & Silberschatz, "Operating System Concepts", Addison-Wesley company
2. Tenenbaum, A.S., "Modern Operating System", PHI Publication

BCA-402: INTRODUCTION TO DBMS—SQL

UNIT: 1

Overview of Database Management System : Introduction to Data and Database system, Elements of Database system, DBMS and its 3-tire architecture, Advantages of DBMS (including Data independence), Types of user, Type of Data Base Administrator and their functions.

UNIT: 2

Data Models: Type of Data Models, Detailed Study of Relational model (Properties of relational model, key and Integrity rules), Comparative study between different type of data models, advantage and disadvantages of data models.

UNIT: 3

Normalization and Functional Dependency: Normalization, Need of Normalization, Anomalies associated with Normalization, Functional Dependencies and its Properties, Normal form (1NF, 2NF, 3NF, BCNF).

UNIT: 4

SQL: Introduction, Data definition, views and queries in SQL, SQL construct, Type of SQL (Brief Overview), SQL Join: Multiple table queries, Built-in functions, Specifying constraints and indexes in SQL, Data Manipulation, Data maintenance, Multiple Table Operations, Transaction integrity facilities, Overview of ORACLE; (Data Type, DDL, DML, DCL).

UNIT: 5

Database Security, Integrity and Control: Security and Integrity threats, Defence mechanism, Integrity, Recent trends in DBMS, Distributed and Deductive databases.

SUGGESTED READINGS:

1. C.J. Date, "An introduction to Database system: Vol. 1, Addison Weseley.
2. Bipin Desai, "An introduction to Database system", Galgotia Publications, New Delhi.
3. Korth, "Database and its Concept", TMH.
4. DBMS, Katson Publication, New Delhi

BCA-403: MANAGEMENT INFORMATION SYSTEM

UNIT: 1

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, solving business problems with information systems, Types of information systems, effectiveness and efficiency criteria in information system.

UNIT: 2

An Overview of Management Information Systems:

Definition of a management information system, MIS versus Data Processing, MIS & Decision Support Systems, MIS & Information Resources Management, End user computing, Concept of a MIS, Structure of a Management information system.

UNIT: 3

Concept of planning & Control:

Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.

UNIT: 4

Business applications of information technology:

Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.

UNIT: 5

Managing Information Technology:

Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes.

UNIT: 6

Advanced Concepts in Information Systems:

Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management,

SUGGESTED READINGS:

1. O Brian, "Management Information System", TMH.
2. Gordon B.Davis & Margrethe H.Olson, "Management Information System", TMH.
3. Murdick, "Information System for Modern Management", PHI.
4. Jawadekar, "Management Information System," TMH.

BCA- 404 VISUAL BASIC

UNIT I

Basics of Visual Basic Language, Requirements for VB 6.0, Tool bars, Menu bars- file, edit, view, project, format, tools, Add- Ins menu, Project explorer, Properties Window, code, form, debug Windows, Immediate debug window, local debug window, watch debug window, tool box window, Adding removing custom control to toolbox, creating and saving a project, Visual Development and event driven Programming, OOPS, Object and classes, Properties, Methods and events

UNIT II

Operators, control flow statements, decision making statements, select case statement, iterations: for loop structure, do-loops: do---Until Loops, do ----while, while---wend, With-End With statements, arrays : accessing array elements, double dimensional or multidimensional arrays, dynamic arrays, redimensioning an array Lbound and Ubound statements, option base statements, collections. Procedures and sub procedures. Interacting with the basic controls: Forms, forms collection, controlling one form within another-MDI forms, command buttons, label controls, text box controls, capturing the key strokes, list box controls, combo box controls, lab assignments More controls: Radio buttons, scrollbars, example program, timer control, running lights application, image control, drive list box, searching a drive, the directory list box, file list box copying a file, deleting a file , renaming a file, moving a file, lab assignments.

UNIT III

Creating menu based applications: Menus and the menu editor, designing menus, programming menu commands, manipulating menus at runtime, creating a menu's control array, dialog boxes: message box; visual basic constants for the message box; using the input box. Procedures and functions: Introduction to procedures, types procedures: sub procedure general procedures event procedures function procedures, creating new procedures, selecting existing procedures, calling sub procedures, calling function procedures, calling procedures in other modules, passing arguments to procedures, passing arguments by value; passing arguments by reference, using optional arguments, using an indefinite number of arguments.

UNIT IV

Using new ActiveX controls: Rich text box control, key state control, status bar control, common dialog control, File dialog box, color dialog box, font dialog box, print dialog box, List view control, tree view control, example program, outline control, flat scrollbars, month view, tabbed dialog control, Date Time Picker control.

UNIT: V

Built-in functions/user defined functions and procedures. Arrays, grids and records, Sorting and searching of records. Database Connectivity. Bound Control and Unbound Control, Record set, Types of Connectivity (DAO, ADO, RDO), Introduction to Data Report, Design Data Report, Group Report, Crystal Report.

SUGGESTED READINGS:-

1. Visual Basic for Windows : Gary Cornell, Tata McGraw Hill.
2. "Complete Reference Visual Basic", Tata McGraw Hill
3. Visual Basic ,PHI

BCA-405 System Analysis and Design

UNIT I Introduction

System definition and concepts: Characteristics and types of system, Manual and automated systems

Real-life Business sub-systems: Production, Marketing, Personal, Material, Finance

Systems models types of models: Systems environment and boundaries, Realtime and distributed systems, Basic principles of successful systems

UNIT 2 Systems analyst

Role and need of systems analyst ,Qualifications and responsibilities ,Systems Analyst as and agent of change,

UNIT 3 System Development cycle

Introduction to systems development life cycle (SDLC) :

Various phases of development :Analysis, Design, Development,

Implementation, Maintenance, **Systems documentation considerations:** Principles of systems documentation , Types of documentation and their importance,Enforcing documentation discipline in an organization .

UNIT 4 System Planning

Data and fact gathering techniques: Interviews, Group communication, Presentations, Site visits.

Feasibility study and its importance, Types of feasibility reports, System Selection plan and proposal, Prototyping,

Cost-Benefit and analysis: Tools and techniques

5. Systems Design and modeling

Process modeling, Logical and physical design, Design representation, Systems flowcharts and structured charts , Data flow diagrams , Common diagramming conventions and guidelines using DFD and ERD diagrams. Data Modeling and systems analysis , Designing the internals: Program and Process design ,Designing Distributed Systems .

6. Input and Output

Classification of forms: Input/output forms design, User-interface design, Graphical interfaces

7. Modular and structured design Module specifications ,Module coupling and cohesion , Top-down and bottom-up design .

8. System Implementation and Maintenance Planning considerations, Conversion methods, producers and controls, System acceptance Criteria, System evaluation and performance, Testing and validation, Systems qualify Control and assurance, Maintenance activities and issues.

9. System Audit and Security

Computer system as an expensive resource: Data and Strong media

Procedures and norms for utilization of computer equipment, Audit of computer system usage, Audit trails,

Types of threats to computer system and control measures: Threat to computer system and control measures, Disaster recovery and contingency planning

TEXTS BOOKS

1. System analysis and design – Elias M.Awad.

REFERENCES

1. System analysis and design –Perry Edwards

2. Analysis and design of information systems – James A.Senn