BCA SYLLABUS

SEM I

S. No.	Paper Code	Paper Name
1.	BCA101	Information Technology and Office Automation
2.	BCA102	Discrete Mathematical Structure
3.	BCA103	Digital Electronics
4.	BCA104	Elements of System Analysis and Design
5.	BCA105	Programming & Problem Solving Through 'C'
6.	BCA106	Practical (C, MS Office)

SEM II

S. No.	Paper Code	Paper Name
1.	BCA201	Data Structures Using C
2.	BCA202	Management Information System
3.	BCA203	Multimedia Applications
4.	BCA204	Programming and Problem Solving through C++
5.	BCA205	Operating System
6	BCA206	Practical (Data Structures, C++)

SEM III

S. No.	Paper Code	Paper Name
1.	BCA301	Data Base Management System (Using SQL Server)
2.	BCA302	Programming and Problem Solving Through Visual Basic
3.	BCA303	Computer Architecture
4.	BCA304	Designing and Analysis of Algorithms
5.	BCA305	Financial Accounting Using Tally.
6.	BCA306	Practical (DBMS, Visual Basic)

SEM IV

S. No.	Paper Code	Paper Name
1.	BCA401	Computer Networks
2.	BCA402	Java Programming
3.	BCA403	Software Engineering
4.	BCA404	Web Designing
5.	BCA405	Computer Oriented Numerical Methods
6.	BCA406	Practical (Java, HTML), Mini Project

SEM V

S. No.	Paper Code	Paper Name
1.	BCA501	Programming and Problem Solving Through C#
2.	BCA502	Cryptography and Network Security
3.	BCA503	Introduction to Artificial Intelligence
4.	BCA504	Software testing And Quality Management
5.	BCA505	Computer Graphics
6.	BCA506	Practical (C#)

SEM VI

S. No.	Paper Code	Paper Name
1.	BCA601	Introduction to E-Commerce
2.	BCA602	Linux & Shell Programming
3.	BCA603	Practical (Linux)
4.	BCA604	Industrial Training And Project

SEMESTER I

PAPER CODE: BCA 101
PAPER NAME: Information Technology and Office Automation

UNIT -I

Introduction, Characteristics of Computers, Block diagram of computer
Types of computers and features: Mini Computers, Micro Computers, Mainframe Computers, Super Computers(02).Types of Programming Languages: Machine Languages, Assembly Languages, High Level Languages,(02) Translators:- Assemblers ,Compilers, Interpreters and Linkers,(01) Operating System concepts, Types of OS, Functions of OS.(03)
Lectures: 08

UNIT -II

I/ODevices:- Keyboard,Mouse,Scanner,Lightpen,Trackball,Joystick, Barcode reader, OCR, OMR,MICR, Digitizer; Monitor, Printer,Plotter etc.(02) Memory concepts, Types of Memory (Primary and Secondary):- RAM,ROM and its types.Secondary Storage Devices (Magnetic tape,Magnetic Disk(FD, HD),Optical Disk(CD,DVD), Pen drive) (04). Data Organization: Drives, Files, Directories.(01)
Lectures : 07

UNIT -III

MS Word –Menus, Toolbars,Formatting, Editing Text, Find and Replace, Header and Footer,Working with text boxes, columns, pictures, Tables, Formatting Tables, Word Art, Mail Merge(04).
MS Power Point –Creation of Presentation, Built-in-Wizard. Working with Text, list, colour and transitions. Header and Footer, Drawing tools, Animation and sound, Importing Objects from other applications(03).
Lectures : 07

UNIT -IV

MS Excel –An overview of worksheet, Creating work-sheet and work book, Opening and saving work book and existing Excel, Formatting, conditional Formatting, Cell Formatting, Producing Charts, Macros, Data menu: Filter, Sort, Table, validation. Using files with other Programme (04).
MS Access –Understanding Databases, Primary Key, Foreign Key, Composite Key, Create Tables and Queries, Forms, Create Report(04)
Lectures : 08

Total Lectures:30

Reference Books :

1. Fundamental of Computers – By V. Rajaraman B.P.B. Publications
2. Fundamental of Computers – By P. K. Sinha

PAPER CODE: BCA 102
PAPER NAME: Discrete Mathematical Structures

UNIT-I

Sets: Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian product, Cardinality of Set, Simple Applications.(03)
Relations And Functions**:** Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions.(05)
Lectures : 08

UNIT-II

Partial order relations and lattices: Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub(03), Lattices & Algebraic Systems, Principle of Duality, Basic Properties, Sub lattices, Distributed & Complemented Lattices(05)
Lectures : 08

UNIT-III

Number Theory: Greatest Common Divisors, Euclidean Algorithms, Fibonacci Numbers, Complexity of Euclidean Algorithms, Congruences and Equivalence Relations, Public Key Encryption Schemes, Dividends(03)

Groups & Sub groups: Group axioms, permutation groups, subgroups, cosets, normal subgroups, semi-groups, free semi-groups, monoids (03), sequential machines, error correcting codes, modular arithmetic grammars(01).
Lectures : 07

UNIT-IV

Combinatorics & Recurrence Relations: Basic Theorems on permutation and combinations. Pigeon hole principle, principle of inclusion and, exclusion(02). Ordinary & exponential generating functions,(01) recurrence relation, solving recurrence relation by substitution, solving recurrence relation by conversion to linear recurrence relation(04)
Lectures : 07

Total Lectures:30

Text Book:

1. Kolman, Busby and Ross, “Discrete Mathematical Structure”, PHI, 1996.

Reference Books:

1. H.K. Dass, “Advanced Engineering Mathematics”; S.Chand & Co., 9th Revised Ed.,2001.
2. S.K. Sarkar, “Discrete Maths”; S. Chand & Co., 2000 Kolman, Busby & Ross "Discrete Mathematical Structures"
3. Trembly. J.P. & Manohar. P "Discrete Mathematical Structures with Applications to computer Science"
4. C.L.Liu, "Elements of Discrete Mathematics"

PAPER CODE: BCA 103
PAPER NAME: Digital Electronics

UNIT-I

Binary System : Digital Computers and digital systems , Number system(02), Binary Arithmetic , Signed binary numbers, complements : r's complements(2's complement, 10's complements), (r-1)'s complements (1's complement, ,9's complement) , Subtraction using 1's complement and 2's complement method , Binary codes ,Logic gates: Inverter, AND, OR, NOR, NAND, XOR, XNOR, De-Morgan's Theorems, Boolean algebra, Canonical and standard forms , Karnaugh Map (03) , Introduction to IC Digital logic families(RTL, DTL, TTL, ECL, MOS and CMOS) and characteristics (Fan-In ,Fan-out, Power Dissipation , Propogation delay ,Noise margin) of IC Digital logic families (TTL , ECL , CMOS) (02)
Lectures: 07

UNIT-II

Combinational and sequential Circuits : Half adder , Full adder , Half Subtractor , full Subtractor , Serial and parallel adder (03) , Code conversion circuits(01) , Parity generator and checker (01) , Comparators(01) , Encoder , Decoder , Multiplexer , De-multiplexer (02)
Lectures: 08

UNIT-III

Flip flops: RS-Flip flop, D-Flip flop, T-flip flop, JK-Flip flop , JK Master slave flip flop, edge triggered and pulse triggered flip flops (04), Registers: Simple Register , Shift registers ,Types of Shift Register , Construction and timing diagram of 4-bit Shift Register (03).
Lectures: 07

UNIT-IV

Counter - Binary counter, characteristic of counter-(Synchronous/Asynchronous, Modulus/length of counter, UP/DOWN counter, Speed of Asynchronous counter) Construction of full length and Non full length, UP/DOWN Synchronous counter using 2, 3 and 4 FF, Ripple counter. Design of different MOD counter, Construction of Asynchronous counter, Ring Counter, Johnson Counter(04) .
Random Access Memory, Read Only Memory, Types of Read Only Memory(02), Multivibrators- Astable, Monostable, Bistable, Schmitt Trigger, Timer (02)
Lectures: 08

Total Lectures: 30

Reference Books:

1. Digital Electronics- By Morris Mano
2. Electronics- V.K. Mehta
3. Digital Electronics- R.P. Jain

PAPER CODE : BCA 104
PAPER NAME: Elements of System Analysis and Design

UNIT -I

System concept, Definition, Characteristics and Elements of System,(03) **Types of System:**-Abstract and Physical system, Open and Closed System, Deterministic and Probabilistic System, Man made Information System, System Models and types of models, System environment and boundaries,(03) **system analyst** ,role of system analyst, qualification and responsibilities of System Analyst(02).

Lectures:08

UNIT -II

System development life cycle and its various phases:-Preliminary investigation, determination of system requirements, Development of software, System testing, Implementation, evaluation and maintenances,(04) System Flow chart and its symbols **Software Crisis**: From programmers' point of view, from users' point of view. (02)

Lectures:06

UNIT -III

System Analysis:-System Planning, Information Gathering and its Tools,(02) Feasibility study ,steps in feasibility analysis , its report and importance,(02) various tools of Structured Analysis:- data flow diagrams, Data Dictionary, Decision Tree, Structured English, Decision Table(02),Cost /Benefit Analysis, Introduction of Control Flow Graph, CPM, PERT chart, Gantt chart.(02)

Lectures:08

UNIT -IV

System design:-process modeling, logical and physical design, design methodologies(02) **data base design**:-objectives of database,Types of relationship, types of data structure, (02)**system testing and quality assurance**:-reason of system testing,nature of test data,Test plan,types of System test ,Quality assurance goals in SDLC,levels of Quality Assurance(02) ,**implementation and software maintenance**:-Introduction of implementation,primary activities of a maintenance procedure and reducing maintenance cost(02).

Lectures:08

Total Lectures:30

Text Books :

1. System Analysis and Design by Elias M. Awad.
2. Software Engineering by Pressmen.
3. System analysis and design By Kendell & kendell

PAPER CODE: BCA 105
PAPER NAME: Programming And Problem Solving Through 'C' Language

UNIT-I

Fundamentals of C programming, Programming Techniques and Concepts, Overview of C, History and Structure(02), C character set, Identifiers and Keywords, Data types, Data Types Declarations, Constants and Variables, Expression and statement and symbolic constants, Basic I/O(03), Preprocessor command: #include, define, preparing and running a complete C program.(03)

Lectures : 10

UNIT-II

Operator and expression: Arithmetic, unary, logical, bitwise, assignment and conditional operators, library functions, (03)Construction of loops and implementation, control statement: (02)While, Do-While, For Statements nested loops, If-else, switch, break, continue and go-to statements, comma operator. (03)

Lectures : 08

UNIT-III

Array one dimensional and two dimensional arrays, Null terminated Strings as Array of Characters,(02) Functions, functions prototypes, function call, call by value, call by reference, Recursion(03), storage classes: automatic, external and static variables(02),Pointer: Declaration, uses of pointers, array of pointers, Passing pointer to a Function, Operations on Pointers. (03)

Lectures : 07

UNIT-IV

Structure variables, Initialization, Structure Assignment, Nested Structures, Structures and Functions, Structures and Arrays. Unions Declarations,(03) File handling: Open, Close, Create, Process, unformatted data file.(02)

Lectures : 05

Total Lectures:30

Reference Books :

1. Fundamental of Computers – By V. Rajaraman B.P.B. Publications
2. Fundamental of Computers – By P. K. Sinha
3. C in Depth -S.K.Srivastava,Deepali Srivastava
4. Let us C -Yashvant Kaniktar

PAPER CODE: BCA 106
PAPER NAME: Practical(C, MS-Office)

SEMESTER II

PAPER CODE: BCA 201
PAPER NAME: Data Structure Using C

UNIT-I

Data Structure, definition, and application, Arrays: Representation of single and multidimensional arrays; sparse arrays - lower and upper Triangular matrices and Tri-diagonal matrices, Recursion (01), Defining Stack and Queue, Stack Operations and Implementation, Array Implementation, Pointer Implementation, Stack Applications, Convert Number Bases by Using Stacks, Infix to Postfix Conversion, Evaluation of postfix expression.(03) Introduction and primitive operation on queues, D-queues Queue Application, Circular, Double Ended and Priority Queues.(03)

Lectures: 07

UNIT-II

Lists, Basic Terminology, Static Implementation of Lists, Pointer Implementation of Lists, Insertion in a list, Deletion from a list, traversal, Searching, Arrays using Linked List, Doubly Linked Lists, Circular, Doubly, Circular Doubly Linked List(07)

Lectures: 07

UNIT-III

Defining Graph, Basic Terminology, Graph Traversal: Depth First Search (DFS), Breadth First Search (BFS), Shortest Path Problem,(03) Trees: Introduction and terminology; Traversal of binary trees; Algorithms for tree operations such as traversal, insertion, deletion; Binary Trees, Inorder, Postorder and Preorder Traversals,(02) Minimal Spanning Tree, Prims and Kruskals Algorithm, Binary Search Trees, Operations on a BST, Insertion, Deletion , Search for a key in BST, B-Trees: Introduction: Threaded Binary tree, AVL Trees(04)

Lectures: 09

UNIT-IV

Searching and Sorting techniques, Sequential Search, Binary Search, Selection Sort, Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sort, Heap Sort, Bucket or Radix sort.(05) Hashing.(02)

Lectures: 07

Total lectures:30

Reference Books:

1. Data Structure through C- G.S.Baluja
2. Data Structures Using C: Aaron M. Tannenbaum

PAPER CODE: BCA 202
PAPER NAME: Management Information System

UNIT-I

Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, Solving business problems with information systems,(02) Types of information systems, Effectiveness and efficiency criteria in information system.(04)

Lectures: 06

UNIT-II

An overview of Management Information Systems: Definition of a management information system, MIS versus Data processing, (03) MIS & Decision Support Systems, MIS & Information Resources Management,(03) End user computing, Concept of an MIS, Structure of a Management information system.(02 Lectures)

Lectures: 08

UNIT-III

Concepts of planning & control: Concept of organizational planning, The Planning Process, Computational support for planning,(03)

Business applications of information technology: Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions,(03) Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.(04)

Lectures: 10

UNIT-IV

Advanced Concepts in Information Systems: Enterprise Resource Planning, Supply Chain Management,(03) Customer Relationship Management, and Procurement Management.(03)

Lectures: 06

Total Lectures:30

Text Books:

1. O Brian, "Management Information System", TMH
2. Gordon B. Davis & Margrethe H. Olson, "Management Information System", TMH.

Reference Books:

1. O Brian, "Introduction to Information System", MCGRAW HILL.
2. Murdick, "Information System for Modern Management", PHI.
3. Jawadekar, " Management Information System", TMH.
4. Jain Sarika, "Information System", PPM
5. Davis, "Information System", Palgrave Macmillan

PAPER CODE: BCA 203

PAPER NAME: Multimedia Applications

UNIT-I

Multimedia concepts, Introduction to basic techniques of multimedia development and delivery, Process of multimedia Production, (03)Hardware/Software requirement for multimedia, (02)Components of multimedia: Textual information, images, Animation, Digital Audio, Digital Video, Planning and Design of Multimedia, Production of multimedia, Distribution of Multimedia. (03)

Lectures: 08

UNIT-II

Multimedia development Tools, Features of Software required for Multimedia: (01) Integrating Multimedia Elements, Script Language Programs, Icon based programs, DLL, hypertext, Cross Platform Capability, Runtime Player for distribution, (02) Authoring tools: Author ware, Everest Authoring System, Icon Author, ImageQ, Quick Time.(04)

Lectures: 07

UNIT-III

Element of Hypertext: Nodes, Links, Annotations, Buttons, Editors, Browsers, Trails; (01)Application of Hypertext: Business Applications, Computer Applications, Educational Applications, Entertainment and Leisure Application; (02) Planning Multimedia Program/Application: Goal, Outlining, Logic Flowchart, Program Story board, Creation of Building blocks, (02) Copyright issue and management. (02)

Lectures: 07

UNIT-IV

Developing multimedia building blocks: Text, Graphics, Sound and Video in Multimedia Applications, (03) Application areas of Multimedia: Entertainment, Edutainment, Business Communications, Public Access, Knowledge transfer; (02) Multimedia-an interactive system for Teaching and Learning: Simulations, Composition; Multimedia-as a technological challenge for developers (03)

Lectures: 08

Total Lectures:30

Reference Books:

1. Principles of Interactive Multimedia By Elsom Cook – TMH
2. 3D Computer Animation – Vince – Addison Wesley

PAPER CODE: BCA 204
PAPER NAME: Programming & Problem Solving Through C++

UNIT-I

OOP concept, Procedural vs OOP Programming, OOP terminology and features (01), Tokens, Character set, Keywords, Data-types Declarations, Constants and variables, Expressions , Standard Library and header files(02) Operator and Expressions; Arithmetic Operator, Increment/Decrement Operator, Relational Operator, Logical Operator and Conditional Operators, Logical Expression, Flow of control statement; Selection statement, Iteration Statement, Jump statement, Construction of loops and implementation , while, Do-while, for statements nested loops.(04).

Lectures:07

UNIT-II

Arrays one dimensional and two arrays.(01)

Classes and Objects: Need for Classes, Encapsulation, Information Hiding (01), Declaration of Classes, iostream operators, referencing class Members,(02) Scope of Class and Its members, Scope resolution operator and its uses, Nested Classes(03)

Lectures:07

UNIT-III

Functions in class: function definition, Default arguments, Constants arguments, Call by value, Call by reference, Calling Functions with arrays, returning from a function,(03) storage class specifies automatic, external and static variable(01), Function overriding, Function overloading, Operator Overloading. Functions: Friend, Inline, Abstract, Virtual, Pure Virtual.(05)

Lectures:09

UNIT-IV

Constructors and Destructor: Declaration, Definition and characteristics(01) Default Constructor, Copy constructor, Parameterized constructor, constructor overloading (03) Inheritance: Need, Different forms, single Inheritance, Multiple Inheritance.(03)

Lectures:07

Total Lectures:30

Text Books:

1. Introduction to C++, E. Balaguruswamy
2. Let us C++, Yashavant Kanetkar

Reference Book:

1. C++, Sumita Arora

PAPER CODE: BCA 205
PAPER NAME: Operating System

UNIT-I
Introduction to OS,(02) Function of OS-Process Management, Device Management, Memory Management, Information Management,(02) Types of an operating system: Batch System, Multiprogramming and Timesharing ,Parallel ,Distributed and real time System(03)
Lectures : 07

UNIT-II
Process Management: Process Concept, Process Scheduling, CPU Scheduling Criteria, Preemptive and Non Preemptive Scheduling, Scheduling Algorithm: FCFS, SJF, RR (04)
Dead Lock: Resource allocation graph, Introduction: Characterization, Deadlock conditions, Dead lock prevention, Avoidance and Detection. Safe state condition. (04)
Lectures : 08

UNIT-III
Memory Management: Logical and Physical address space, Swapping, Contiguous allocation space, Paging, Fragmentation: Internal and External (04) Virtual Memory Management: Demand paging, Page replacement algorithm: FIFO, LRU, OPR(04)
Lectures : 08

UNIT-IV
File System: File concepts, Access methods, Directory Structure File-System Implementation: File system structures, Directory Implementation, Allocation methods(03)
Disk Management: Disk Structure & Scheduling Methods, Disk management FCFS, SSTF, SCAN, LOOK, C-SCAN, C-LOOK (04)
Lectures : 07

Total Lectures:30

Text Books:
1. Silbersachatz and Galvin, "Operating System Concepts", Pearson, 5th Ed., 2001
2. Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001

Reference Books:
1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000
2. William Stallings " Operating System Concepts"

PAPER CODE: BCA 206
PAPER NAME: Practical(Data Structure, C++)

SEMESTER III

PAPER CODE: BCA 301
PAPER NAME: Database Management System (Using SQL Server)

UNIT -I
Data, Information and knowledge, introducing database and different kinds of database users, concept or a database, interacting with a database,(02) architecture of a database, using relational databases, basics of relational databases, using relational databases(02), identifiers for relations, characteristic of database, database system concepts and data independence, content of data dictionary, data administration function.(02)
Lectures: 06

UNIT -II
Traditional data model – ANSI/SPRC, 3-level architecture, over view, of three traditional models – hierarchical, network and relational models, comparison of these models(01), ER model(02), File organization technique – random, file organization technique, multi key file organization technique, Indexing (02), concurrency control, database security, database recovery(03)
Lectures:09

UNIT -III
Data Normalization (02) Introduction to SQL: Characteristics and advantages, SQL Data Types and Literals, DDL, DML, SQL Operators (02), Tables: Creating, Modifying, Deleting, Views: Creating, Dropping, Updating using Views SQL DML Queries: SELECT Query and clauses, Set Operations, Predicates and Joins,.Aggregate Functions, Nested Queries(04)
Lectures:08

UNIT -IV
Specifying constraints and indexes in SQL, data manipulation, multiple table operations (03)
Database Modification using SQL Insert, Update and Delete, T-SQL: Cursor, concept of Stored Procedures, Functions and Triggers (04)
Total Lectures:07

Total Lectures:30

Text Books:
1 R. Elmarsi and SB Navathe, "Fundamentals of Database Systems", Addison Wesley,4th Ed., 2004

Reference Books:
1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.
2. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993.
3. A. K. Majumdar, P. Battacharya, "Data Base Management Systems', TMH, 1996.4. Bipin Desai, "An Introduction to database Systems", Galgotia Publications, 1991.

PAPER CODE: BCA 302
PAPER NAME: Programming and Problem solving through Visual Basic

UNIT -I

Basic of Visual Basic Language Requirements of VB6.0 Toolbars Menu bars, file, edit.., view, project, format, tools, Add-Ins Menu, Project Explorer, Properties Windows, Code, form (02), debug windows, Immediate debug window, local debug window, watch debug window, tool box window, Adding removing custom control to tool box, creating and saving a project (02), Visual Development and event driven programming, OOPS, Object and classes, Properties, Method and events.(03)

Lectures:07

UNIT -II

Operators, Control Flow, Statement, Decision making statements, select case statement, iteration: for loop structure, do-loop, do-until loops, do-while, while-wend, with-end with statement, arrays: accessing array elements, double dimensional or multidimensional array, dynamic arrays, redimensioning an array Bound and Unbound statement, option base statement, collections.(04) Procedure and Functions, Procedures and function: types of procedures, sub procedure general procedures event procedures function procedures, creating new procedures, selecting existing procedures, calling functioning procedures, calling procedure in others modules, passing argument by value, passing argument by reference (04)

Lectures:08

UNIT -III

Interacting with the basic controls. Forms, controlling one form within another – MDI forms, command buttons, label control, text box controls, computing the key, list box control, combo box control, lab assignments.(03**)** More controls. Radio buttons, scroll bars, example program, timer control, running lights application, image control,(03) drive list box, searching a drive, the directory list box, file list box copping the file, deleting the file, renaming a file, moving a file.(02)

Lectures:08

UNIT -IV

Creating menu based application, menus and the menu editor, designing menus, programming menus commands, creating a menus control array, dialog boxes, message box, visual basic constant for the message box, Using the input box.(04).Database connectivity though Visual Basic6.0, Introduction to AciveX controls: Rich text box control, status bar control, common dialog control, list view control, tree view control, toolbar, month view, Date time Picker control. Using new Active X control(03)

Lectures;07

Total Lectures:30

Text Books:

1. E. Petroutsos, “Mastering Visual Basic 6.0”, BPB Publications, 1998.
2. Perry, Greg, “Teach Yourself Visual Basic 6 in 21 Days”, Techmedia, 1998.

Reference Books:

1. E. Petroutsos, “Mastering Database Programming with Visual Basic 6”, BPB Publications, 2000
2. Norton Peter, “Peter Norton’s Guide to Visual Basic 6”, Techmedia, 1998.

PAPER CODE: BCA 303
PAPER NAME: Computer Organization and Architecture

UNIT-I

Register Transfer Language , Register Transfer, Bus and memory Transfer,(02) Micro-Operations, Arithmetic Micro-Operation, Logic Micro-Operation, Shift Micro-Operation, Common Bus Organization ,Multiple Bus Organization, Arithmetic Logic Shift Unit (02), Addition and Subtraction Algorithm(01) ,Multiplication Algorithm (Booth Multiplication Algorithm) (02)

Lectures: 07

UNIT-II

Instruction Codes , Computer Instruction(01) , Computer Registers (DR, AR, AC, IR, PC, TR, INPR, OUTR) , Instruction Cycle (Fetch and Decode) (02), **Control unit Organization**: Functional Requirements of a Control Unit, Hardwired Control Unit(02) , Micro programmed Control Unit (Microinstructions , Micro program Sequencer) (03)

Lectures:08

UNIT-III

Processor Design: General Register Organization , Stack Organization(Push and Pop Operation , Register Stack , Memory Stack) (02), Instruction Format(Zero Address Instructions , One Address Instruction ,Two address Instruction , Three Address Instruction) ,Data transfer and manipulation(Data transfer Instructions , Data Manipulation Instructions , Program Control Instructions) (02) ,RISC and CISC Architecture (01) , Addressing Schemes: Immediate Addressing, Direct Addressing, Indirect Addressing, Register Addressing, Register Indirect Addressing, Displacement Addressing (02)

Lectures: 07

UNIT-IV

Input-Output Organization: I/O Interface, Modes of transfer, Interrupts & Interrupt handling, Direct Memory access (DMA controller , DMA transfer)(03) ,**Memory Organization:** Memory Hierarchy, Main Memory (RAM and ROM Chips)(02), Auxiliary memory(Magnetic disks , magnetic Tapes), Cache memory (Hit Ratio , mapping techniques :Associative mapping ,Direct mapping ,Set associative mapping), Introduction to Virtual Memory(03).

Lectures:08

Total Lectures:30

Text Book:

1. Computer System Architecture, M. Mano(PHI)

Reference Books:

1. Computer Organization, Vravice, Zaky & Hamacher (TMH Publication)
2. Structured Computer Organization, Tannenbaum(PHI)
3. Computer Organization, Stallings(PHI)
4. Computer Organization, John P.Hayes (McGraw Hill)

PAPER CODE: BCA 304
PAPER NAME: **Designing and Analysis of Algorithms**

UNIT – I

Mathematical Preliminaries: Review of growth functions, (02 Lectures) Introduction of algorithm, characteristics of algorithm, (02) Complexity of algorithm, Efficiency of Algorithm(01), Asymptotic notations.(02)

Lectures:07

UNIT – II

Sorting and Searching- Insertion sort, Bubble sort, Selection sort, (02) Quick sort, Merge sort, (02) Radix Sort, Bucket Sort, (02 Lectures) External Sorting (01)Searching-Sequential and Binary search and their complexities. (01)

Lectures:08

UNIT -III

Greedy algorithms, general characteristics of greedy algorithms, (02) job sequencing, minimum spanning tree, Single source shortest paths. (02) The knapsack problem, task scheduling problem, (01) Divide and Conquer Technique: merge sort, quick sort, strassen's matrix multiplication (02)

Lectures:07

UNIT -IV

Dynamic Programming: General method Matrix multiplications,Travelling sales person problem, binary search trees, 0/1 knapsack problem(04)

Backtracking – n-Queen's Problem, Hamiltonian Circuit problem, graph colouring (02)

Branch and bound –Traveling salesman problem. FIFO branch and bound(02)

Lectures:08

Total Lectures:30

Text Books:

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Clifford Stein, "Introduction to Algorithms", 2nd Ed., PHI, 2004.
2. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

Reference Books:

1. A. V. Aho, J. E. Hopcroft, J. D. Ullman, "The Design and Analysis of Computer Algorithms", Addition Wesley, 1998.
2. Ellis Horowitz and Sartaz Sahani, "Computer Algorithms", Galgotia Publications,1999.
3. D. E. Knuth, "The Art of Computer Programming", 2nd Ed., Addison Wesley, 1998

PAPER CODE: BCA 305
PAPER NAME: Financial Accounting using Tally

UNIT -I
Meaning and Objectives of Accounting, Basic Accounting Terms, Principles Concepts and Conventions of Accounting. Double Entry System, Classification of Accounts under Double Entry system and their rules, Accounting Equations (Practical problems)
Lectures: 07

UNIT -II
Books of Original Entry-Journal, Ledger Trial balance, Cash Book, Financial Statement with Simple Adjustment.
Lectures: 08

UNIT -III
An Overview of Tally Fundamentals, Processing Accounting Transaction in Tally Creation of Ledger and Groups. Voucher types, Accounting Vouchers Contra, Receipt, Payments, Journal, Sale Invoice and Purchase Invoice.
Lectures: 07

UNIT -IV
Financial Statement in Tally, Trial Balance, Trading & Profit and Loss Accounts, Balance Sheet, Report Generation-Cash Book / Petty Cash Book, Bank Account, Statistics and other Reports.
Lectures: 08

Total Lectures:30

Text Book:
1. Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003

References Books:
1. D. K. Goyal, "Financial Accounting."
2. P.C.Tulsian, "Financial Accounting"
3. Gupta R. L., Gupta V. K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999
4. Khan & Jain, "Financial Accounting"
5. Maheshwari S. N., "Principals of Management Accounting", 11th Edition, Sultan Chand & Sons, 2001.
6. Shukla and Grewal, "Advanced Accounts", 14th Edition, Sultan Chand & Sons.

PAPER CODE: BCA 306
PAPER NAME: Practical (DBMS, Visual Basic)

PAPER CODE: BCA 401
PAPER NAME: Computer Networks

UNIT - I

Computer networks, Networks Hardware-----Local Area network, Metropolitan Area network, Wide Area network, (02) Wireless network, Internetworks, (02) Networks Software: Protocol Hierarchies, Design and Issues for layers, (02) Interfaces and Services, Connection oriented and Connection less Services (02)
Lectures:08

UNIT- II

Reference Models, and OSI Reference Model, TCP/IP Protocol Suit (03) The Physical Layer: Maximum Data Rate of a channel, Transmission Media: Magnetic Media, Twisted Pair, Baseband and Broadband Coaxial cable, Fiber Optical (03) Wire less Transmission, structure of telephone system, Switching, Multiplexing, ISDN (02)
Lectures:08

UNIT -III

Data link layer, Error control, Flow control, Sliding Window Protocol, (03) Channel Allocation Problem, Multiple Access Protocol: ALOHA, CSMA protocol, Collision Free protocol, Polling, (02) Network layer: Routing Algorithm, Congestion Control Algorithm, IP protocol, IP Addresses. (02)
Lectures:07

UNIT -IV

Transport Layer: Addressing, Establishing and releasing a connection, (02) TCP service Model, TCP protocol (02), the Application Layer: Network Security, Domain Name System(03)
Lectures:07

Total Lectures:30

Text Book:

1. Computer Networks by Andrew S Tanenbaum

References Books:

1. Computer Netwoks and Internet by Douglas E Comer
2. Data Communication and Networking by Brijender Singh
3. Computer Networks by Peter Norton
4. Computer Networking with Internet Protocols by William Stallings

PAPER CODE: BCA 402
PAPER NAME: Java Programming

UNIT -I

Java programming language overview, History of Java, features of Java, Java architecture,(02) referring to applets and applications, compiling and running a program, Byte code and JVM, (02) Java primitives data types, Variables: Declaration, Initialization, scope and lifetime, Command line arguments. (02)
Lectures:06

UNIT -II

Java Operators, Typecasting, (02) Control statements and looping structure: if statement, switch construct, while loop, the for loop, the do loop, the break statement, the continue statement, retun statements, arrays. (02) Classes and object: concept of OOPS, constructors, types of constructors ,garbage collector, finalize(),(02) java method and object declaration, java methods, types of methods, passing arguments, methods overloading, constructor overloading, access specifiers. (02)
Lectures: 08

UNIT -III

Inheritance, using inheritance,this and super keywords, (02) overriding methods, Abstract classes, Package and Interface: defining packages, importing packages, grouping classes in packages, creating Interface, implementing interface, using interface ,extending interface. (04)
String handling: using the string class as data type, using strings, string constructors, using string without the new modifier, using string methods, StringBuffer class.
Vector, exception handling, multithreading (02)
Lectures: 08

UNIT -IV

Graphical user interface: defining applet, applet lifecycle, applet tags, applet methods, drawing lines, rectangles, polygons (02)
AWT package class hierarchy, AWT controls, button, labels, text field, text area, check box, radio box, list, scroll bars, choice, frame, adding a button, creating panels ,layout managers. (04) Introduction to Servlets and RMI(02).
Lectures: 08

Total Lectures:30

Text Books:

1. J2EE- Balaguruswamy
2. Java- R. Krishnamothy

References Books:

1. Java Black book-Seven Holzner
2. Java: a beginner's guide- Herbert Schildt
3. Core Java-Gary Cornell

PAPER CODE: BCA 403
PAPER NAME: Software Engineering

UNIT -I

Software Engineering Fundamentals **:**Definition of software product and process(02), Software Crisis, Software development paradigms(02), Software lifecycle models: Waterfall Model, Prototyping Model, Iterative Enhancement Model, Evolutionary Development Model and Spiral Model(03).

Lectures: 07

UNIT -II

Software Requirement Analysis & Specification :System specification, Software requirements specification (SRS) standards(02), Formal specification methods, Specification tools, Requirements validation and management(02).

Software Process: Software Process and Models, Tools and Techniques of Process Modeling, Product and Process(02). important qualities of software product and process: correctness, reliability, robustness, user friendliness, verifiability, maintainability, reusability, portability, data abstraction, modularity, Principles of software engineering(02).

Lectures:08

UNIT -III

Software Design: Software architecture, Modular design - cohesion and coupling(02), Process-oriented design, Data-oriented design, User-interface design, Real-time software design(02).

CASE Tools: Relevance of CASE tools, High-end and low-end CASE tools(01), Automated support for data dictionaries, DFD, ER diagrams(02).

Lectures: 07

UNIT -IV

Coding and Testing: Choice of Programming languages, Coding standards(02), Introduction to Testing Process, Functional & Structural Testing(02), Testing Activities like Unit, Integration & System Testing(02), Testing tools and workbenches(02).

Lectures: 08

Total Lectures: 30

Text Book:

1. "Software Engineering-A Practitioner's approach"-R.S. Pressman

Reference Book:

1. "Software Engineering " by Pankaj Jalote

PAPER CODE: BCA 404

PAPER NAME: Web Designing

UNIT -I

Internet evolution of internet, internet application, client and servers, hosts and nodes, internet services, (02) different types of connections, dial up, leased, VSAT, (02) internet service providers, choosing an ISP, (02) DNS system, E-mail, basics e-mail functions, E-mail Protocols. (02)

Lectures:08

UNIT -II

Introduction *to* HTML-- a short history of World Wide Web ,creating first HTML document, understanding basics of HTML tools, entering tags and attributes, (02) applying structures tags, linking documents, URL, types of URL's, (02) constructing link anchors, inserting e-mail, links, including images, developing images, adding images(02), using images as links, using background images(01)

Lectures:07

UNIT III

Tables, creating basic tables, spanning rows and columns, adding captions, formatting tables, adding and formatting borders(02).HTML forms, developing forms, creating forms, (03) Frames:creating frames, accommodating non-framed browsers(02)

Lectures:07

UNIT IV

Java Script: adding java script, what is java script, (02) adding event handlers, Loops, control statements, functions,(02) validations, (02) Introduction to DHTML.Style Sheets. (02)

Lectures:08

Total Lectures:30

Text Books:

1. Web Design Complete Reference by Thomas A. Powell
2. JavaScript: The Complete Reference by Thomas A. Powell

Reference Books:

1. HTML Black Book: The Programmer's Complete HTML Reference Book by Steven Holzner
2. HTML:A Beginner's Guide, Second Edition by Wendy Willard
3. Learning Web Design: A Beginner's Guide to HTML, Graphics, and Beyond by Jennifer Niederst

PAPER CODE: BCA 405
PAPER NAME: Computer Oriented Numerical Methods

UNIT -I

Numerical system and error and types of error, Floating point Arithmetic, Source of error, Zeros of transcendental equations and polynomials (03), system of non linear equation, Solution of Algebraic and transcendental function- Bisection Method , Iteration Method, Method of false position, Newton Raphson method, Generalized Newton's method (04).

Lectures:07

UNIT -II

Solution of system of linear equation, Gaussian elimination method, Gauss Jordon method (02), Pivoting, Iterative methods of Jacobi and Gauss Seidel Methods (03), Matrix Inversion Method (01), Method of Factorization (01).

Lectures:07

UNIT -III

Interpolation, Errors in Polynomial Interpolation, Finite Differences, Forward differences, Backward Differences, Central Differences (02), Newton's formula for interpolation, Guass's central difference formula (02), Stirling's Formula, Bessel's formula (02), Lagrange's Interpolation Formula, Error in Lagrange's Interpolation Formula (02).

Lectures:08

UNIT -IV

Numerical differentiation, Error in Numerical differentiation , Cubic Spline method (03), Numerical Integration: Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule , Romberg's Interpolation (03), Numerical solutions of ordinary differential equations: Solution by Taylor's series, Euler's Method, Runge-kutta Methods (02).

Lectures:08

Total Lectures:30

Text Book:

1. Computer Based Numerical & Statistical Techniques – by Manish Goyal

Reference Books:

1. Numerical Analysis –by Goel and Mittal
2. Numerical Methods in Engineering and Science – by Dr. B. S. Grewal
3. Numerical Methods – by S. S. Sastry

PAPER CODE: BCA 406
PAPER NAME: Practical (Java, HTML), Mini Project

PAPER CODE: BCA 501
PAPER NAME: Programming and Problem Solving through C#

UNIT -I

The .net Framework: introduction, common language runtime, common type system, common language specification, (02) the base class library, the .net class library, Intermediate language, (02) Just in time compilation, garbage collection, assemblies, web services, COM, localization(03)

Lectures:07

UNIT -II

C# Basics: Introduction, data types, identifiers, variables, constants, C# statements, OOPs concept, (02) array and strings, operators, control statements, classes and objects(02), access modifiers, overloading, inheritance, overriding, interfaces. (03)

Lectures:07

UNIT -III

Visual studio IDE features, introduction to Window forms, components, (02) control: textbox, label, linklabel, status bar, (02) checkedlistbox, combobox, listbox, listview, radiobutton, button, panel, (02) groupbox, dialog box, menu control, properties, methods, events of controls. (02)

Lectures:08

UNIT -IV

ADO.net, the component model, creating database connection, database command, (02) data repeater, connecting to data sources, choosing a .net data provider, (02) manage a connection, building command objects, (02) executing commands, building datasets and datatables, data adapter (02)

Lectures:08

Total Lectures:30

Text Book:

1. C# Programming for beginners By Mahesh Chand

Reference Books:

1. The Complete Visual C# Programmer's Guide
2. A Programmer's Introduction to C# 2.0, Third Edition
3. C# and the .NET Platform, Second Edition

PAPER CODE: BCA 502
PAPER NAME: Cryptography and Network Security

UNIT- I

Introduction to Network Security, Aspects of Network Security, Need For Security, Goals Of Network Security(03), Features of a good Security policy, security attacks, security services and mechanisms, network security, Firewall: type, hardware and software, design principles(04)

Lectures:07

UNIT- II

Encryption/decryption, conventional encryption model, conventional encryption(03) algorithms: character level encryption, bit-level encryption, private key encryption, Data encryption Standard algorithm, strength of DES(05)

Lectures:08

UNIT- III

Public key encryption, principles of public key cryptography systems, RSA algorithm, security of RSA(03), Fermet's and euler's theorem, primality, The chineese remainder theorem, Digital signature, application for public key cryptosystems.**(**04)

Lectures:07

UNIT- IV

E-mail security, PGP, S\MIME security, S\MIME functionality, cryptographic algorithms(03), IP Security: application of IPSec, Benefits of IPSec, IPSec architecture, IPSec Services, Authentication header, Encapsulating Security payload.(03) Web Security: threats on web, SSL and Transport layer Security. System security : virus and Intruders.**(**02)

.**Lectures:08**

Total Lectures:30

Text Books:

1. W. Stallings, Networks Security Essentials: Application & Standards, Pearson Education, 2000
2. W. Stallings, Cryptography and Network Security, Principles and Practice, Pearson

PAPER CODE: BCA 503
PAPER NAME: Introduction to Artificial Intelligence

UNIT -I

Introduction, The importance of AI , Applications of AI , general issue in AI problem solving (02), production system (01), knowledge: Definition & importance, knowledge based systems , components of knowledge based system (03), intelligent agents (02).
Lectures:08

UNIT -II

Search and Control Starategies, Examples of Search Problems(The eight puzzle, Travelling Salesman Problem) (03), Uninformed Search (Breadth First Search , Depth First Search , Depth First Iterative Depending Search , Bidirectional Search) and informed search (Heuristic Information , Hill Climbing Methods ,Best First Search , Branch and Bound Search ,A* Search) (03), Searching AND-OR Graphs, The AO* Algorithm , Game Playing : mini max search approach (01).
Lectures:07

UNIT -III

Formalized Symbolic logics: Propositional logic , Syntax and Semantics for Propositional Logic ,Limitation of Propositional Logic (02), First order predicate Logic , Syntax and Semantics for FOPL ,Properties of Well Formed Formula (02), skolemisation, Conversion to Clausal Form (01) , inference rules (01), unification, resolution principle, (01).
Lectures:07

UNIT -IV

Semantic networks, frame system(02), value inheritance scripts(02), LISP and other AI programming languages(02), introduction to PROLOG(02).
Lectures:08

Total Lectures:30

Text Book:

1. D.W. Patterson, "Introduction to AI and Expert Systems", PHI
2. E. Rich and K. Knight, "Artificial intelligence", TMH

Reference Book:

1. Nils J Nilsson ,"Artificial Intelligence -A new Synthesis" Harcourt Asia Ltd.

PAPER CODE: BCA 504
PAPER NAME: Software Testing and Quality Management

UNIT -I

Testing Software :Software Testing and its importance, Module Testing, Integration Testing, Top-down versus bottom up testing, Mixed testing.(03)

Software Faults and Failures: Types of faults, Origins of Software Defects, The Cost of Repairing Defects(01)Verification and Validation :Verification Testing, Coding standards, Walk-Through, Formal Inspection, Verifying . Requirements, Verifying Functional Design, Validation Test Criteria, Design metrics. (03)

Lectures:07

UNIT -II

Testing Techniques and Strategies :White-Box Testing: Flow graph notation, Cyclomatic Complexity, Control Structure and Loop Testing, Dataflow Testing.(03)

Black-Box Testing: Graph-based testing methods, Equivalence partitioning, Boundary Value Analysis,Unit Testing, Integration Testing, System Testing, Exhaustive Testing.(04)

Lectures:07

UNIT -III

BuildingTests and Test Plans :Designing and Creating Tests, Maintaining Checklists, White-box Test Cases and Test Procedures, Test Data Selection and Outputs, Black-box test cases and test procedures, Planning and Creating Test Plans. (04)

Testing Specialized Systems and Applications :Graphical User Interface (GUI) Testing, Usability Testing, Client/Server Architectures and Web Testing, Testing OO Systems, Volume and Stress Testing (03)

Testing Measurements: Software Size and Complexity, Function Point Analysis(02)

Lectures:09

UNIT -IV

Quality Assurance and Standards:Quality and Quality Assurance (QA), Techniques of quality Assurance, Software Testing and QA,(03)Software Development Models, Quality metrics, Configuration Management, Quality management models *(ISO*, SPICE, IEEE, and CMM).(04)

Lectures:07

Total Lectures:30

Text Books:

1. W.M. Perry, “Effective Methods for Software Testing", 2002, Wiley.
2. Nina Godbole, “Software Testing and Quality Management”
3. .A.Behforooz and F.Hudson, “Software Engineering Fundamentals", 1996, OUP.

Reference Books:

1. James Peters & W. Pedrycz, "Software Engineering", 2000, Wiley.
2. S. Pfleeger, "Software Engineering", 2001 , Peterson Education.
3. A.Behforooz and F.Hudson, “Software Engineering Fundamentals", 1996, OUP.

PAPER CODE: BCA 505
PAPER NAME: Computer Graphics

UNIT -I

Application of computer graphics, graphics devices- LED,LCD,CDA,FPD (03), drawing geometry, Line drawing Algorithms: DDA and Bresenham, Functions implementation(03), Cathode Ray Tube implementation.(01)
Lectures:07

UNIT -II

2D transformation: Translation, Rotation, Scaling, Reflection, Shearing(02), Circle Drawing: Bresenham and Mid-point sub divison function implementation(02), Clipping: End Point Codes, Cohen Sutherland, Mid point Subdivision Algorithm(02), Mapping, dragging,echoing, Polygon Filling, character generation(03)
Lectures:09

UNIT -III

3D graphics transformation-translation,rotation,scaling,reflection,shearing(02), Projection:parallel, Prespective projection(04), Hidden surface, removal algorithm method, back face removal algorithm,Z Buffer Algorithm, floating horizon technique(02)
Lectures:08

UNIT -IV

Tweening-interpolation, morphing technique(01), GKS- primitive,work station(03), multimedia application-animation principle,animation tools(02)
Lectures:06

Total Lectures:30

Text Books:

1. Mathematical Elements of Computer Graphics- Rogers(TMH)
2. Procedural Elements of Computer Graphics- Rogers(TMH)

Reference Book:

1. Computer Graphics- Hearn M. Baker (Pearson Education)

PAPER CODE: BCA 506
PAPER NAME: Practical (C#)

SEMESTER VI

PAPER CODE: BCA 601
PAPER NAME: Introduction to E-Commerce

UNIT- I

Introduction to E-Commerce: Definition of E-Commerce, Scope of E-Commerce, driving forces for E-Commerce (02), Issues in implementing E-Commerce, E-Commerce Applications, Advantage- Business & Customer, Disadvantages (02), framework for understanding e-business, Classification of E-commerce, E-commerce Business Models (03).
Lectures:07

UNIT -II

Firewall: Types, Features, Characteristics(02), Electronic Data Interchange (EDI): Concept, Components, Differences between traditional EDI & Paper EDI, Advantages of EDI(03), Business Application of EDI, EDI Communication Process, EDI Security, Digital Signature(02).
Lectures:07

UNIT -III

Electronic Payment System: EPS Models, EPS Processing, Digital token based(01), debit card, smart card, Credit Card, risk in electronic payment system(03), E-auction: Introduction, Overview, Electronic trading(01), Online Banking: origin, advantages, disadvantages, Services (03).
Lectures:08

UNIT -IV

Web Security factors, E-Commerce security threats, security schemes, Protocols, Digital Certificates(03), Cyber law in India, Supply Chain Management (SCM): Components and issues(02), Customer Relationship Management (CRM): definition, Components, Benefits, ECRM: concept,impact, ECRM v/s CRM(03)
Lectures:08

Total Lectures:30

Text Book:

1. E-Commerce - Ritendra Goyal

Reference Books:

1. E-Commerce – Bharat Bhaskar
2. E-Commerce -- CSV Murthy

PAPER CODE: BCA 602
PAPER NAME: Linux & Shell Programming

UNIT - I

Linux introduction and file system – Basic Features, Advantage, Installing requirement , Basic Architecture of Unix/Linux System, Kernel , Shell(02).
Linux File System-Boot block, super block, Inode Table, data blocks, how Linux Access Files, storage files, Linux Standard directories(02). Commands for files and directories cd , ls, cp ,md, rm , mkdir , rmdi , pwd , file ,more, less, creating and viewing files using cat , file comparison- cmp & comm., view files, disk related commands, checking disk free spaces(03).
Lectures:07

UNIT- II

Essential Linux commands, Understanding shells, Processes in linux- process fundamentals, connecting process with pipes, tee, Redirecting input output, manual help(03). Background processing ,managing multiple process, changing process priority with nice, scheduling of process at command, cron , batch commands ,kill ps, who, sleep, Printing commands find ,sort, touch , file ,file related commands ws, sat, cut , dd , etc.(02) Mathematical commands- bc , expr , factor , units (02). Creating & editing files with vi, joe & vim editor (01).
Lectures: 08

UNIT- III

System Administration: Common Administrative tasks, identifying administrative files, configuration and log files, role of system administrator, managing user accounts- adding and deleting users, changing permission and ownership, creating and managing groups, modifying group attributes, temporary disable user accounts, creating and monitoringfile system(03) , checking and monitoring system performance, file security and permission, becoming super user using su. Getting system information with uname, host name, disk partition & sizes, users, kernel(02). Backup and restore files, reconfiguration hardware with kudzu, installing and removing packages with rpm command(02)
Lectures:07

UNIT- IV

Shell programming- Basic of shell programming, various types of shells available in Linux, comparisons between various shells, shell programming in bash, read command, conditional and looping statements, case statements, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automate system tasks(05). Simple filter commands- pr, head, tail, cut, paste, sort, uniq, tr. Filter using regular expressions- grep, egrep and sed. Awk programming- report printing with awk(03).
Lectures:08

Total Lectures-30

Text & Reference books:

1. UNIX- Concepts & Applications (Third Ed.)- Sumitabha Das, TMH
2. Unix for programmers and users(Third Ed.) – Graham Glass & King Ables, Pearson Education India
3. Red Hat Linux 9 Bible- Christopher Negus , IDG Books India Ltd.
4. Stephen Prata- Advanced Unix – A Programmer's Guide, BPB Publication, 2008

PAPER CODE: BCA 603
PAPER NAME: Practical (Linux)

PAPER CODE: BCA 604
PAPER NAME: Industrial Training and Project