

INTERNATIONAL COLLEGE FOR GIRLS

(AUTONOMOUS)

SFS, GURUKUL MARG, MANSAROVAR, JAIPUR

DEPARTMENT OF COMPUTER APPLICATION & INFORMATICS

COURSE OF STUDY

U.G. PROFESSIONAL PROGRAMMES

IN

BACHELOR OF COMPUTER APPLICATION (B.C.A.)

Syllabi applicable to students seeking admission to UG Professional Programmes in the discipline of Computer Application in the Academic Session 2007-2008

Semester-I

Paper-I : BASICS OF ENGLISH Paper Code: BCA-101

Credits: 02

Periods/week: 02

Max. Marks: 100

Objective: This module is introduced to reinforce selected components of grammar. It also aims at strengthening compositional skills in the students.

UNIT – I

[No. of Hrs: 6]

Grammar-I

- Sentence Structure
- Subject & Predicate
- Tenses

UNIT – II

[No. of Hrs: 7]

Grammar-II

- Prepositions
- Modals
- Active & Passive Voice

UNIT – III

[No. of Hrs: 6]

Grammar-III

- Subject-Verb Agreement
- Punctuations
- Common Errors

UNIT – IV

[No. of Hrs: 5]

Paragraph Writing

Job Applications (Solicited Unsolicited and Layout)

UNIT – V

[No. of Hrs: 6]

- Reading Comprehension:
(Reading at various speeds (slow, fast, very fast), reading different kinds of texts for different purposes (e.g., for relaxation, for information, for discussion at a later stage, etc.); reading between the lines.)
- Effective Listening (Techniques)

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Quirk & Greenbaum, “Advanced English Usage”, Pearson Education.

REFERENCES:

1. Banerjee Meera & Mohan Krishna, “Developing Communication Skills”, Macmillan Publications, 1990.
2. Chaturvedi P.D., “Business Communication”, Pearson Publications.
3. Mathew M.J., “Business Communication”, RBSA, Publications, 2005.
4. Taylor Shirley, “Communication of Business”, Pearson Publications.

PAPER-II : FOUNDATION OF MATHEMATICS
Paper Code: BCA 102

Credits:04

Periods/week:04

Max. Marks:100

Objective: This module is designed to acquaint with the basics of mathematics.

UNIT I: **[No. of Hrs:12]**

Matrices, Types of Matrices, Operations of addition, Scalar Multiplication and Multiplication of Matrices, Determinant of a Square Matrix, Minors and Cofactors. Transpose, adjoint and inverse of a matrix. Solving system of linear equations, in two or three variables using inverse of a matrix.

UNIT II: **[No. of Hrs:12]**

Sets, Relation & Functions: Definition of Set, Type of Sets, Operations on Sets, Venn diagram, Cartesian Product, Relations, Functions, Types of function, Some elementary functions with their graphs (Exponential, logarithmic, modulus). Limit & continuity of a function (Simple Problems).

UNIT III: **[No. of Hrs:12]**

Differentiation: Derivative and its meaning, Rules of Differentiation, Differentiation by substitution, Higher order differentiation, Maxima and Minima of simple functions. Partial Differentiation (Introduction & simple problems).

UNIT IV: **[No. of Hrs:12]**

Integration: - Integral as Anti-derivative process, Indefinite Integrals, Rules of Integration, Integration by substitution, Definite Integration, Properties of Definite Integral, finding areas of simple closed curves.

UNIT V: **[No. of Hrs:12]**

Coordinate Geometry: - 2D Cartesian Co-ordinate system. Straight line (Equation & Slope of a line). Circle : Equation of Circle, Equation to Tangent. Conic Sections: Focus, Eccentricity, Directrix, Axis of a conic section, Parabola, Ellipse.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. G. C. Sharma & Madhu Jain, "Mathematics for BCA", Oscar Publication.
2. R. D. Sharma, "Mathematics Vol-2", Dhalpat Raj & Sons. (For Unit-I)
3. S. L. Loney., "The Elements of Co-ordinate Geometry Part-I", Book Palace, New Delhi.

REFERENCES:

1. Tom M. Apostol, "Calculus Volume II", Second edition, John-Wiley & Sons, 2002.
2. S. Balachandra Rao, C.K. Shantha, "Differential Calculus", New Age International(P) Ltd.
3. Frank Ayres Jr., Elliot Mendelson, "Calculus", fourth edition, Mc-Graw Hill International Edition.

PROPOSED COVERAGE:

UNIT – I:	Essential Reading 2
UNIT – II, III & IV:	Essential Reading 1
UNIT – V :	Essential Reading 3

PAPER-III : ELECTRICAL AND SEMICONDUCTOR FUNDAMENTALS

Paper Code: BCA 103

Credits: 04

Periods/week: 04

Max. Marks: 100

Objective: This Module is introductory in nature, and emphasis is given on basic concepts and direct application of mathematical expressions without analysis. Student will be able to understand the basic concepts of electricity and working of Semiconductor devices used while designing the computers

UNIT - I

[No. of Hrs: 12]

Electric current , Resistance , Ohm's Law , Series and parallel combination of resistances, Kirchoff's current and voltage laws.

Concepts of Magnetism and electromagnetism :Magnetic field , Magnetic flux, Faraday's law of electromagnetic induction, magnetic properties of matter, concepts of diamagnetic, paramagnetic and ferromagnetic materials

Alternating current and direct current , instantaneous , average and rms values of AC, series LR , series RC , series LCR and parallel LCR circuits , resonance.

UNIT - II

[No. of Hrs: 12]

Atomic structure(energy levels and electronic configuration), energy band theory, energy band structure of insulators, semiconductors, and conductors, mobility and conductivity, Intrinsic Semiconductors, energy levels in intrinsic semiconductors, donor and acceptor impurities, Extrinsic semiconductors (n type, p type), energy levels in extrinsic semiconductors.

UNIT - III

[No. of Hrs: 12]

p-n junction diode, working, depletion layer, I-V characteristics, forward and reverse resistances of diode, pinch off voltage, breakdown voltage, forward/reverse current, types of diodes-Zener, LED, Tunnel, Photo, Varactor (working , characteristics, uses, symbols)

Rectifiers, working of half wave, full wave and bridge rectifiers- PIV, ripple factor, efficiency, and comparison of rectifiers.

Filter circuits, types of filter circuits

UNIT - IV

[No. of Hrs: 12]

Transistors, construction details, working of n-p-n and p-n-p transistors, transistor biasing, current components, various transistor configurations and input/output characteristics, transistor as an amplifier, frequency response of an amplifier. Linear Amplifier (Audio)

UNIT - V

[No. of Hrs: 12]

Semiconductor devices: Construction, working, symbol & characteristics of the following:

FET: JFET, MOSFET, Thyristor -SCR, Seven Segment LED / LCD.

BOOKS RECOMMENDED:**ESSENTIAL READINGS:**

1. Harris Benson, "University Physics", John Wiley & Sons, Wiley International Edition.
2. V.K. Mehta "Principles of Electronics", Fifth Edition, S. Chand & Co.

REFERENCES:

1. Kumar Mittal, "Physics, Part – I", Naveen Publications, Meerut.
2. Milliman Hallkias "Electronics Principles", Mc Graw Hill Publ.
3. Malvino Leach "Principle of Electronics", Mc Graw Hill Publ.

PROPOSED COVERAGE:

UNIT-I : [Chapter 27 : 27.1,27.3,27.4, Chapter 28: 28.2,28.3, Chapter 29: 29.1,Chapter 31: 31.1-31.3, Chapter 32: 32.6, Chapter 33: 33.1- 33.7 ,Essential Reading(1)]

UNIT-II : [Chapter 7 : 7.1-7.5 , Chapter 8: 8.1,8.5,8.8 - 8.13,Essential Reading(2)]

UNIT-III: [Chapter 8 : 8.14 – 8.19 Chapter 9: 9.7 – 9.20 Chapter19 : 19.3 – 19.5, Essential Reading(2)]

UNIT-IV : [Chapter 10 : 10.1-10.13 , Essential Reading(2)]

UNIT-V : [Chapter 21 : 21.1 – 21.12,21.17 ,21.18 Essential Reading(2)]

PAPER-IV : COMPUTER FUNDAMENTALS

Paper code: BCA 104

Credits: 04
Periods/Week: 04
Max. Marks: 100

Objective: To acquaint the students with the basics of computer system.

UNIT – I **[No. of Hrs: 11]**

The Computer Defined, Parts of Computer System: Hardware, Software, Data, Users, The information processing cycle. Computer Generations.

Essential computer hardware: Processing Devices, Memory Devices: RAM, ROM, Input and Output Devices, Storage Devices: Magnetic and Optical Storage, Software: System and Application Software.

Input Devices: Keyboard and Mouse: The Standard Keyboard Layout, How Computer Accepts Input from Keyboard, Using Mouse, Variants of Mouse, Other Data Input Devices: Pen, Touch Screens, Bar Code Readers, OCR

Output Devices: CRT Monitors, Flat Panel Monitors, Comparing Monitors, Video Cards, And Printers: Dot Matrix, Ink Jet, Laser Printers, Comparing Printers.

UNIT – II **[No. of Hrs: 11]**

Data Representation: Number Systems, Bits and Bytes, Text Codes.

Data Processing: The CPU, Machine Cycles, Memory, Factors Affecting Processing Speed, Registers, Memory and Computing Power, Computer's Internal Clock, Bus, Cache Memory.

Microcomputer Processor: Intel Processor, IMB Processor, RISC Processors, Parallel Processing, Ports: Standard Computer Ports, Serial and Parallel Ports, Specialized Expansion Ports: SCSI, USB, FireWire, MIDI, Expansion Slots and Boards, PC Cards, Plug and Play.

UNIT – III **[No. of Hrs: 14]**

Secondary Storage Devices: Sequential access devices; Magnetic tapes: Types, Basic Principles of operation, advantages, Limitations of magnetic Tapes.

Direct access devices, Magnetic disks: Types, Basic Principles of operation, advantages, Limitations of magnetic disks. Optical disks: Types, Basic Principles of operation, advantages, Limitations of optical disks.

UNIT – IV **[No. of Hrs: 14]**

Operating System: Purpose of Operating Systems, Types of Operating System, User Interface: Graphical User Interfaces, Command Line Interfaces, Running Programs, Sharing Information, Managing Hardware: Processing Interrupts, Working with Device Drivers, Utility Software, Backup Utilities, Antivirus, Firewall, Intrusion Detection, Screen Savers.

PC Operating Systems: DOS, Windows NT Workstation, Windows 9x, Windows 2000 Professional, Windows XP, Macintosh Operating System, UNIX and Linux.

UNIT – V **[No. of Hrs: 10]**

Number Systems; Computer Arithmetic.

Productivity Software: Commercial Software, Freeware and Public Domain Software, Open-Source Software, Word Processing Programs: Interface, Entering and Editing Text, Formatting Text, Spreadsheet Programs: Interface, Entering Data in Worksheet, Presentation Programs: Interface, Creating Presentation, Presenting Slide Shows, Macros.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. Norton Peter, “Introduction to Computers”, 6th Ed., TMH, 2001

REFERENCES:

1. P. K. Sinha & Priti Sinha , “Computer Fundamentals”, BPB Publications, 1992.
2. V. Raja Raman, “Introduction to Computers”, PHI,
3. Alex Leon & Mathews Leon, “Introduction to Computers”, Vikas Publishing House, 1999.
4. Vikas Gupta, “Comdex Computer Kit”, Wiley Dreamtech, Delhi, 2004

PROPOSED COVERAGE:

UNIT – I	[Chapter 1: Lesson 1A, Lesson 1B, Chapter 2: Lesson 2A, Lesson 2B, Chapter 3: Lesson 3A, Lesson 3B : Essential Reading 1] [Chapter 1: References (1)]
UNIT – II	[Chapter 4: Lesson 4A, Lesson 4B Essential Reading 1]
UNIT – III	[Chapter 8: References (1)]
UNIT – IV	[Chapter 6: Lesson 6A, Lesson 6B Essential Reading 1]
UNIT – V	[Chapter 3&5: References (1), Chapter 7: Lesson 7A, Essential Reading 1]

PAPER-V : PROGRAMMING IN 'C'
Paper Code: BCA 105

Credits: 04
Periods /Week: 04
Max. Marks: 100

Objective: This module is designed to acquaint the students with the basics of 'C' programming language.

UNIT – I

[No. of Hrs:10]

Introduction to computers: Personal computing, Distributed Computing and Client/ Server Computing, Machine Languages, Assembly Languages and High level Languages, The history of C, The C standard library, Structured Programming, the basics of a typical C program Development Environment.

Introduction to 'C' programming: Introduction, A Simple C program, Memory Concepts, Arithmetic in C, Decision making.

Structured Program Development in C: Introduction, Algorithm, Pseudocode, Control structures, The if selection structure, The if/else selection structure.

UNIT – II

[No. of Hrs:12]

Structured Program Development in C: The while repetition structure, Counter Controlled Repetition, Sentinel Controlled Repetition, Nested control structures, Assignment operators, Increment and Decrement operators.

C Program control: Introduction, Essentials of repetition, Counter controlled repetition, The for repetition structure, for structure: notes and observations, The switch Multiple selection structure, The do/while repetition structure, the break and continue statements, Logical operators, Equality and Assignment operators.

UNIT – III

[No. of Hrs:15]

C Functions: Introduction, Program Modules in C, Math Library Functions, Functions, Functions Definitions, Function Prototypes, Header Files, Calling Functions: Call by Value and Call by reference, Storage Classes, Scope rules, Recursion, Recursion vs. Iteration.

C Arrays: Declaring Arrays, Passing Arrays to Functions, Sorting arrays (Bubble Sort), Searching (Linear, Binary Search), Multiple-Subscripted Arrays.

UNIT – IV

[No. of Hrs:12]

C Pointers: Introduction, Pointer variable declaration and initialization, Pointer operators, Calling functions by reference, Const qualifier, Pointer Expressions and pointer arithmetic, Relationship between pointers and Arrays, Arrays of Pointers.

C characters and Strings: Introduction, Fundamentals of Strings and characters, Character and String Handling Library, String conversions and comparison functions.

UNIT – V

[No. of Hrs:11]

C Formatted Input/Output: Streams, formatting output with printf, Printing: Integers, Floating point numbers, Strings, Characters. Field Widths and Precisions, Flags in print format control string, Escape sequences, formatted input with scanf.

C structures, Unions, Bit Manipulations and Enumerations: Introduction, Structure Definition, Initializing structures, Accessing Members of structures, typedef, Union, Bitwise operators, Bit Fields, Enumerated Constants.

C File Processing: Files and streams, Sequential access file(Creation, Reading and Writing).

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. H.M.Deitel & P.J.Deitel, "How to program in 'C'", 3rd Edition, Pearson Education, 2001.

REFERENCES :

1. B.Kernighan & D.Ritchie "C Programming Language", 2nd Edition, Prentice-Hall, 1988.
2. E. Balagurusami, "Programming in 'ANSI C'", TMH Publications.
3. Yashwant Kanetkar, "Working with C", BPB Publications.
4. S. Lipschutz, "C Programming", Schaum's outline series, Tata McGraw Hill Edition.

PROPOSED COVERAGE:

UNIT – I	[Chapter 1: 1.5-1.8 & 1.13 & 1.14 Chapter 2, Chapter 3: 3.1-3.6 Essential Reading(1)]
UNIT – II	[Chapter 3: 3.7 – 3.12, Chapter 4 Essential Reading(1)]
UNIT – III	[Chapter 5 & 6 Essential Reading(1)]
UNIT – IV	[Chapter 7, 8 Essential Reading(1)]
UNIT – V	[Chapter 9,10 & 11: 11.3 –11.5 Essential Reading(1)]

PAPER-VI : BASICS OF ACCOUNTING
Paper Code: BCA 106

Credits: 04
Periods/week:04
Max. Marks: 100

Objective: To develop a conceptual understanding of fundamentals of the accounting system and their application in business.

UNIT –I **[No. of hrs: 06]**
Basics of Bookkeeping and Accountancy: Definition and its usefulness, Financial Accounting: Principles, Concepts and Conventions.

UNIT-II **[No. of hrs: 14]**
System of Bookkeeping: Double Entry System, Books of Prime Entry, Subsidiary books, Recording of Cash and Bank Transactions, Preparation of ledger Accounts, preparation of Trial Balance.

UNIT-III **[No. of hrs: 10]**
Bank Reconciliation Statement : Need for Reconciliation between Cash Book and Pass Book, Problems relating to the preparation of Bank Reconciliation Statement
Depreciation Accounting : Straight Line and Diminishing Balance method, computation and accounting treatment of Depreciation, changes in Depreciation method.

UNIT-IV **[No. of hrs: 10]**
Final Accounts: Concepts of Capital, Revenue and Deferred Revenue Expenditure, Opening entries, Closing entries, Adjustment entries, Manufacturing, Trading and Profit and Loss account(with adjustment) and Balance Sheet.

UNIT –V **[No. of hrs: 20]**
Computerized Accounting:
Use of Accounting Software Tally, Creation of Company, Voucher Entry, Analysis of Trial Balance and Final Accounts.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Jain, Khandelwal Pareek , “Financial Accounting”, Ajmera Book Company
2. A.K Nadhani, K.K Nadhani, “Tally 7.2”, B.P.B Publications

REFERENCES:

1. Accountancy- PC Tulsian (Tata Mc- Graw-Hill)
2. Accountancy-DK Goel, Rajesh Goel(Arya Publications)
3. An Introduction to Accountancy- S.N Maheshwari(Vikash Publishers)
4. Fundamental of Accounting-Dr T P Ghosh,(Sultan Chand& Sons)
5. A. Mukharjee, M. Hanif, “Modern Accountancy”, Tata McGraw-Hill
6. Dr Ashok Sehgal, Dr Deepak Sehgal, “Fundamentals of Financial Accounting“ TaxMann’s

Note- The candidate shall be permitted to use battery operated pocket calculator that should not have more than 12 digits, 6 functions and 2 memories and should be noiseless and cordless

PAPER-VII : OFFICE MANAGEMENT LAB

Paper Code: BCA 107

Credits: 02

Periods/week: 04

Max. Marks: 100

Objective: To make students familiar with general purpose office management tools.

UNIT – I

[No. of hrs: 12]

Introduction to CLI: Concept of Operating System, Important terms in DOS (program, file, directory, names, volume label, disk drive & its name (DOS prompt)

DOS file system: path & path names, Internal Commands(DIR, CD, MD, RD, COPY, DEL, REN, DATE, TIME, VER, VOL, CLS, TYPE, PROMPT, PATH) and External Commands(ATTRIB, BACKUP, RESTORE, FORMAT, SYS, FIND, LABEL, SORT, XCOPY, TREE, DELTREE, PRINT, MEM, DOSKEY, MOVE, MORE, CHKDSK, APPEND, DISKCOPY, DISKCOMP, MODE, UNDELETE).

Introduction to GUI: Introduction features (Desktop & its components, the window, the application window (various bars), the document window, the dialog window, the icons).

Windows explorer; Control panel, setting wallpaper, screen saver and background.

Creating a folder, Copying & moving file, Scandisk, Checking & Formatting disk space, Compressing/ Zipping files (WinZip), Virus & Antivirus.

UNIT – II

[No. of hrs: 12]

Introduction to Word Processor: Features of Word processors, working with formatted text, Shortcut keys.

Formatting documents: Selecting text, Copying & moving data, Formatting characters, changing cases, Paragraph formatting, Indents, Drop Caps, Using format painter, Page formatting, Header & footer, Bullets & numbering, Tabs, Forming tables.

Finding & replacing text, Go to (F5) command, Proofing text (Spell check, Auto correct), Reversing actions, Macros, Inserting pictures, Hyperlinks, Mail merging, Printing documents.

UNIT– III

[No. of hrs: 12]

Introduction to Spreadsheets, workbooks, creating, saving & editing a workbook, Renaming sheet, cell entries (numbers, labels, and formulas), spell check, find and replace; Adding and deleting rows and columns

Filling series, fill with drag, data sort, Formatting worksheet, Functions and its parts, Some useful Functions in excel (SUM, AVERAGE, COUNT, MAX, MIN, IF);

Cell referencing (Relative, Absolute, Mixed), What-if analysis

Introduction to charts: types of charts, creation of chart from adjacent data/ nonadjacent data, printing a chart, printing worksheet.

UNIT –IV

[No. of hrs: 12]

Introduction to Presentation Software : Uses, Presentation tips, components of slide, templates and wizards, using template, choosing an auto layout, using outlines, adding subheadings, editing text, formatting text, using master slide; adding slides, changing colour scheme, changing background and shading, adding header and footer, adding clip arts and auto shapes.

Various presentation, Working in slide sorter view (deleting, duplicating, rearranging slides), adding transition and animations to slide show, inserting music or sound on a slide, Inserting action buttons or hyperlinks for a presentation, set and rehearse slide timings, viewing slide show, Printing slides.

UNIT – V**[No. of hrs: 12]**

Introduction to Database management system; An Overview of Access, Access Tables, Data Types, Access Query, Access Reports, Creating Relationships, OLE (importing & exporting data)

BOOKS RECOMMENDED:**ESSENTIAL READINGS:**

1. Courter, “Mastering Office 2000”, BPB Publications.

REFERENCES:

1. Robbins, “Mastering DOS”, BPB Publications.
2. Content Development Group, “Working with MS Office 2000”, TMH.
3. Mansfield & Olsen, “Mastering Word 2000”, BPB Publications.
4. Martin, Hansen, Klingher & Beth, “Mastering Excel 2000”, BPB Publications.
5. Murray, “Mastering Power Point 2000”, BPB Publications.
6. Simpson Alan, Robinson, & Celeste, “Mastering Access 2000”, BPB Publications.

PAPER-VIII : 'C' PROGRAMMING LAB
Paper Code : BCA 108

Credits: 02

Periods/week: 04

Max. Marks: 100

Objective : To make students familiar with the basics of 'C' programming language.

This paper will be based on theory paper BCA105. Exercises given will be covering entire syllabi as follows:

1. Simple C programs using variables, keywords and simple operations
2. Programs based on operators (arithmetic, relational, increment, decrement, conditional, logical)
3. Branching statement programs using 'C'
4. Exercises based on Looping (while, do while, for), nested loops based programs
5. Programs based on arrays (single, two dimensional) searching, sorting an array
6. String/Character based exercises manipulation on strings
7. Programs on user defined functions
8. Exercises based on pointers(arithmetic operation, arrays with pointers)
9. Programs on structure and union
10. Exercises on file handling

PAPER-IX : ELECTRICAL & SEMICONDUCTOR PHYSICS LAB
Paper Code: BCA 109

Credits: 02

Periods/week: 04

Max. Marks: 100

Objective: This module will help the student to understand the basic concepts of electricity and working of Semiconductor devices.

They will be doing exercises covering the BCA103 syllabi as given below:

Section A

1. Verification of ohm's law & series combination of resistances
2. Verification of ohm's law & parallel combination of resistances
3. Verification of faraday's law.
4. Characteristics of P-N diode.
5. Characteristics of Zener diode
6. Determine Band gap in junction diode.

Section B

1. To study Input output Characteristics of NPN transistor.
2. Study of ripple factor for half wave rectifier without filter and with L-section filter.
3. Study of ripple factor for full wave rectifier without filter and with π -section filter.
4. Frequency response of transistor audio amplifier.
5. Study FET characteristics.
6. Verify truth tables of NOT, AND, OR gates.

SEMESTER-II

PAPER-I : COMMUNICATION SKILLS

Paper Code: BCA 201

Credits: 02

Periods/week: 02

Max. Marks: 100

Objective: This module is introduced to strengthen the communication skills of the students.

UNIT – I

[No. of Hrs: 5]

Communication

- Definition
- Model (Keith Davis)
- Types (Horizontal, Upward, Downward & Grapevine)
- Barriers(Physical, Semantic & Socio-Psychological)

UNIT – II

[No. of Hrs: 7]

Oral Communication

- Speaking (Achieving desired clarity and fluency, pausing for effectiveness while speaking, making a short classroom presentation.)
- Interviews (Types and techniques)
- Group Discussions (Use of persuasive strategies including some rhetorical devices for emphasizing (for instance; being polite and firm; handling questions and taking in criticism of self; turn-taking strategies and effective intervention; use of body language)
- Presentations (Tools, Technique and essentials)

UNIT – III

[No. of Hrs: 6]

Written Communication-I

- Notice
- Memorandums
- Circulars

UNIT – IV

[No. of Hrs: 7]

Written Communication-II

- Business Letters (Types, Essentials & Layout)
- Report Writing (Types And Format)

UNIT – V

[No. of Hrs: 5]

Case Studies

Assignment including Power Point Presentation

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Banerjee Meera & Mohan Krishna, “Developing Communication Skills” , Macmillan Publications, 1990.

REFERENCE BOOKS:

1. Chaturvedi P.D, “Business Communication”, Pearson Publications
2. Mathew M.J., “Business Communication”, RBSA, Publications, 2005.
3. Taylor Shirley, “Communication Of Business”, Pearson Publications

PAPER-II : DATA STRUCTURES & ALGORITHMS THROUGH 'C'
Paper Code: BCA 202

Credits: 04
Periods/week: 04
Max. Marks: 100

Objective: This module will help the student to learn the logical model of a particular organization of data effectively.

UNIT-I **[No. of Hrs: 10]**

Introduction to Data Structure: Information and meaning: Data type in C, pointers in C, Data structure and C, arrays (one, two, multi dimensional arrays), structure in C, allocation of storage and scope of variable. Introduction to Algorithm Design: Algorithm, its characteristics, efficiency of algorithms, analyzing Algorithms and problems.

UNIT-II **[No. of Hrs: 15]**

Stack and Recursion: Definition of stack, representing stack in C, implementing the push and pop operation, infix, postfix and prefix expression.

Recursion:

Recursion definition, factorial function, Fibonacci series, algorithms, recursion in C

UNIT-III **[No. of Hrs: 10]**

Queues and linked list: Queue and its sequential representation, C implementation of queues, insert operation, priority queue.

Linked list: Introduction to linked list, creation, insertion and deletion of nodes from a list, linked implementation of stacks, get node and free node operations, linked implementation of queues, linked list as a data structure.

UNIT-IV **[No. of Hrs: 10]**

Trees: Introduction and terminology, Operations on binary trees, applications of binary tree, node representation of binary tree, binary tree traversal in C, representing lists as binary trees (finding k^{th} element, deleting an element), C representations of trees.

UNIT-V **[No. of Hrs: 11]**

Sorting and searching: Bubble sort, quick sort, insertion sort (algorithm and C implementation)

Linear search, binary search (Algorithm and C implementation), Hashing (Hash function, collision resolution, open addressing, chaining)

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Y. Langsam, M. J. Augenstein, A.M. Tenenbaum, "Data Structure using C, C++", second edition, Prentice Hall of India, 1999.
2. S. Lipschutz, "Data Structures", Schaum's outline series, Tata McGraw Hill Edition, 2002

REFERENCES :

1. E. Horowitz and S. Sahani, “Fundamentals of Data Structures”, Galgotia Book source Pvt. Ltd, 2000
2. Robert L.Kruse “Data Structures and Program Design”, Third edition, PHI
3. P. S. Deshpande and O.G. Kakde, “C & Data Structure”, Wiley Dreamtech, 1st Edition, 2003

PROPOSED COVERAGE:

- UNIT – I [Chapter 1: 1.1-1.3 Essential Reading (1)]
UNIT – II [Chapter 2: 2.1-2.3, Chapter 3.1-3.2 Essential Reading (1)]
UNIT – III [Chapter 4: 4.1, 4.2, 4.3, 4.5 Essential Reading (1)]
UNIT – IV [Chapter 5: 5.1, 5.2, 5.4, 5.5 Essential Reading (1)]
UNIT – V [Chapter6 &7:6.1 - 6.5, Chapter 7 .1, 7.2, 7.4 Essential Reading (1),
Chapter 9:9.9 Essential Reading (2)]

PAPER-III : COMPUTER ARCHITECTURE
Paper Code: BCA 203

Credits: 04
Periods/week: 04
Max. Marks: 100

***Objective:** In this module student will learn the basic structural design of a computer i.e. Register Transfer Language, Control Unit, CPU etc. They will also learn how all-arithmetic operations are done at architecture level. It also explains the basic organization of Memory and I/O devices.*

UNIT-I

[No. of Hrs: 10]

Register Transfer and Micro-operation: Register Transfer Language, Register Transfer, Bus and Memory Transfer: Three state bus buffers, Memory Transfer; Arithmetic Micro-operations: Binary Adder, Binary Adder-Subtrator, Binary Incrementor; Logic Micro-operations: List of Logic microoperations; Shift Micro-operations(excluding H/W implementation), Arithmetic Logic Shift Unit.

UNIT-II

[No. of Hrs: 14]

Basic Computer Organization and Design: Instruction Codes, Computer Registers: Common bus system; Computer Instructions: Instruction formats; Instruction Cycle: Fetch and Decode, Flowchart for Instruction cycle; Register reference instructions.

Microprogrammed Control Unit: Control Memory, Address Sequencing and Conditional branching, Mapping of instruction, Subroutines.

UNIT-III

[No. of Hrs: 10]

Microprogrammed Control Unit: Design of Control Unit.
Central Processing Unit: Introduction, General Register Organization, Stack Organization: Register stack, Memory stack; Instruction Formats, Addressing Modes.

UNIT-IV

[No. of Hrs: 14]

Computer Arithmetic (excluding h/w implementation): Introduction, Addition and Subtraction, Multiplication Algorithms (Booth algorithm), Division Algorithms.

Input – Output Organization: Peripheral devices, Input – Output interface, Modes of Data Transfer, Priority Interrupt, Direct Memory Access.

UNIT-V

[No. of Hrs: 12]

Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory.

Multiprocessors: Characteristics of multi-processors, inter connection structure, inter processor arbitration, inter processor communication and synchronization, Cache coherence.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Morris Mano, “Computer System Architecture”, 3rd Edition, Prentice-Hall of India Private Limited, 1999.

REFERENCES:

1. William Stallings, “Computer Organization and Architecture”, 4th Edition, Prentice Hall of India Private Limited, 2001.
2. Malvino, “Digital Computer Electronics: An Introduction to Microcomputers”, McGraw Hill, 1993.
3. Moris Mano, “Digital Logic and Computer Design”, PHI Publications, 2002
4. Pal Chaudhuri, P. “Computer Organization & Design”, PHI.
5. Hayes. J.P., “Computer Architecture and Organization”, McGraw Hill Edition.

PROPOSED COVERAGE:

UNIT-I	[Chapter 4 : Essential Reading(1)]
UNIT-II	[Chapter 5 : 5.1-5.3 & 5.5, Chapter 7: 7.1-7.2 Essential Reading(1)]
UNIT-III	[Chapter 7 : 7.4, Chapter 8: 8.1-8.5 Essential Reading(1)]
UNIT-IV	[Chapter 10 : 10.1-10.4 , Chapter 11: 11.1-11.6 excluding 11.3 Essential Reading(1)]
UNIT-V	[Chapter 12 : 12.1-12.6 , Chapter 13: 13.1-13.5 Essential Reading(1)]

PAPER-IV : INTERNET AND WEB DESIGNING

Paper Code: BCA 204

Credits: 04
Periods / Week: 04
Max. Marks : 100

Objective: This module is designed to help students in creating web pages.

UNIT - I

[No. Of Hrs: 12]

Internet: Basic Concepts, Communication on the Internet, Internet Domains, Internet Server identities, Establishing Connectivity on the Internet, IP address, TCP/IP and its services(World Wide Web, FTP & Telnet).

Introduction to Web Server and Web Browser, Communication between a Web server and a Web browser , Navigating the web (using URLs and using Hyperlinks, Browser's navigation tools).

UNIT - II

[No. Of Hrs: 15]

HTML: Introduction to HTML: Commonly used HTML tags, Titles and Footers, Text Formatting

(Paragraph and Line Breaks), Text Styles (Bold , Italics and Underline), Heading Styles and Other Text Effects (Centering and Spacing), Lists(Ordered, Unordered, Definition), Adding Graphics to HTML document (Img, Border attribute, Align and ALT attribute).

Links: External Document reference, Internal Document Reference and Images as Hyperlinks.

UNIT - III

[No. Of Hrs: 11]

Tables: Creating tables, Width and Border attribute, Cellpadding & Cellspacing , BGcolor , Colspan and Rowspan attribute.

Frames: Introduction to Frames, <Frameset> Tag, <Frame> Tag, and Targeting named frames.

UNIT - IV

[No. Of Hrs: 12]

Cascading Style Sheets: Understanding Style Sheets, Applying Style Sheets to HTML document, Developing a Style Sheet: Setting Font attributes, Text Attributes, Border Attributes, Setting Background properties and List Attributes.

UNIT - V

[No. Of Hrs: 10]

Using Class, Tag, External Style Sheets (LINK Tag), Using the DIV tag and Layers.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Ivan Bayross, " HTML, DHTML, Javascript, PERL CGI",BPB
2. Ray, "Mastering HTML 4", Premium Edition –BPB
3. Web site: <http://www.w3.org>

REFERENCES:

1. Norton Peter, "Introduction to Computers", 6th Ed., TMH, 2001
2. Farrar, "HTML Example Book", BPB
3. Ramalho, "Learn Advanced HTML with DHTML", BPB

PROPOSED COVERAGE:

UNIT – I	[Chapter 1&2 Essential Reading (1), Chapter 1 Reference (1)]
UNIT – II	[Chapter 2, 3, 4 & 6 Essential Reading (1)]
UNIT – III	[Chapter 5& 7 Essential Reading (1)]
UNIT – IV	[Chapter 12: Essential Reading (1), Chapter 4: Essential Reading(2)]
UNIT – V	[Chapter 12: Essential Reading (1)]

PAPER-V : DIGITAL ELECTRONICS

Paper Code: BCA 205

Credits: 04

Prds/week: 04

Max. Marks: 100

Objective: This module is designed to introduce the students with binary arithmetic and working of various digital circuits used in computer

UNIT – I

[No. of Hrs:16]

Boolean Algebra: Basics Laws of Boolean Algebra, Logic Gates (NOT, AND,OR, EX-OR, EX-NOR, NAND. NOR), Boolean algebra, De Morgan's theorem

Combinational Logic Design: Standards representation for logical expression, Minimization of logical functions in terms of Maxterm and Minterm, Simplifications of Boolean equations using K-maps, don't care conditions

UNIT - II

[No. of Hrs:15]

Arithmetic Circuits: Half Adder, Full Adder, Half Subtractor, Parallel binary adder/Subtractor.

Combinational Circuits: Multiplexers (74151/74150), De-Multiplexers(74154), decoders (74139/74154/7445), encoders(74148,74147), BCD to seven segment decoder, Parity generator/checkers, magnitude comparators.

UNIT - III

[No. of Hrs: 12]

Sequential circuits: Flip-flops , S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop(truth tables, working)

Logic families, characteristics of digital IC's, sourcing and sinking, Introduction to bipolar families (RTL, RCTL, DTL), TTL logic, Introduction to ECL, CMOS

UNIT-IV

[No. of Hrs: 11]

Shift Registers: Applications of Shift Registers

Counters: Ripple or Asynchronous counters, Synchronous Counter.

UNIT - V

[No. of Hrs:06]

Integrated circuits : IC classifications, IC fabrication, Epitaxial growth, Masking and Etching,

Fabrication of components (Diode, transistor, resistor, capacitor) on Monolithic IC, IC packing's, IC symbols, SSI, LSI, MSI, VLSI

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. R. P. Jain, "Modern Digital Electronics", Mc Graw Hill Publishing Company limited.
2. S. Salivahanan & S. Arivyhgan, "Digital circuits and design" ,"Vikas Publishing house Pvt.Ltd.
3. V.K. Mehta, "Principles of Electronics", Fifth Edition, S. Chand & Co.

REFERENCES:

1. Moris Mano, "Digital Logic and Computer Design", PHI.
2. Malvino Leach, "Digital Principles and Application", Mc Graw Hill Publications.
3. Malvino "Digital Computer Electronics", Mc Graw Hill Publications.

PROPOSED COVERAGE:

Unit I	[Chapter 5: 5.1 to 5.7 Essential Reading (1)]
Unit II	[Chapter 5: 5.3,5.4,5.7,5.8, Chapter 6:6.1-6.5(6.5.1-6.5.4, 6.5.9), 6.7 (6.7.1,6.7.2), 6.8, 6.9, 6.11 Essential Reading (2)]
Unit III	[Chapter 4: 4.1-4.9(4.9.1-4.9.5), 4.10, 4.13.1 Essential Reading (2), Chapter 7: 7.1 - 7.6 Essential Reading (1)]
Unit IV	[Chapter 8:(8.1- 8.5) Essential Reading (1)]
Unit V	[Essential Reading (3)]

PAPER-VI : DISCRETE MATHEMATICS

Paper Code: BCA 206

Credits:04

Periods/week:04

Max. Marks:100

Objective: This module is designed to acquaint students with the basic concepts of matrices and determinants, coordinate geometry, relations and graphs.

UNIT I: [No. of Hrs:12]

Counting and Recursion: Permutations and Combinations, Principle of Inclusion & Exclusion, Pigeonhole Principle, Mathematical induction, Recurrence relation.

UNIT II: [No. of Hrs:12]

Relation & Diagraphs : Product sets & Partitions, Relations & diagraphs, paths in relation & diagraphs, properties of relations, Equivalence relations, computer representation of relations & diagraphs, manipulation of relations, transitive closure & Warshall's Algorithm.

UNIT III: [No. of Hrs:12]

Graphs Theory: Graphs, undirected graphs, weighted graph, paths & cycles, Euler graph & cycles, Hamiltonian graph & cycles, shortest path algorithm (Djikstras algorithm).

Trees: Introduction, labeled trees, m-ary trees, undirected trees, properties of tree, Spanning tree, Minimal spanning tree (Prim's algorithm).

UNIT IV: [No. of Hrs:12]

Ordered Relations & Structures: Partially orderd sets, external elements of partially ordered sets, lattices, finite Boolean algebra, functions on Boolean Algebra, Boolean Functions as Boolean Polynomials.

UNIT V: [No. of Hrs:12]

Propositional Calculus: Proposition & logical operations and the truth tables, Conditional statements, Conditional propositions (Hypothesis, conclusion, necessary and sufficient condition) and Logical equivalence, De Morgan's law, quantifiers, universally quantified statement, generalized De Morgan's Laws for Logic, universal instantiation, universal generalization, existential instantiation, universal generalization.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Bernard Kolmann, Robert C. Busby and Sharon Ross," Discrete mathematical structures", third edition, PHI, 1997.

REFERENCES:

1. Schaum's outline series, "Discrete Maths", Tata McGraw Hill
2. Purohit, "Graph Theory", Jaipur Publishing House
3. C.L. Liu, "Elements of discrete mathematics", McGraw Hill

PROPOSED COVERAGE:

- Unit I [Chapter 3 Essential Reading (1)]
Unit II [Chapter 4 Essential Reading (1)]
Unit III [Chapter 6 & 8 Essential Reading (1), definitions from Ref(1)]
Unit IV [Chapter 7 Essential Reading (1)]
Unit V [Chapter 2 Essential Reading (1), chapter 1 Ref(3)]

PAPER-VII : DATA STRUCTURES & ALGORITHMS LAB
Paper Code: BCA 207

Credits: 02

Periods/week: 04

Max. Marks: 100

Objective: This module will help the student to implement the concepts learned in theory paper BCA 202 using C language.

Practical based on implementation of following different data structures & related operations on them:

- One-dimensional & Two-dimensional Arrays
- Linked Lists
- Queues
- Stacks
- Graphs
- Sorting & searching Techniques

PAPER-VIII : WEB DESIGNING LAB
Paper Code: 208

Credits:02
Periods/week: 04
Max. Marks: 100

Objective: This module is designed to help students for creating web sites.

A topic-based homepage has to be developed by each student using various commands covered in theory paper BCA 204.

Web pages should be designed with following features:

- HTML Basic Tags
- Anchor/Image insertion/Linking
- Tables/Frame/Form
- CSS

PAPER-IX : DIGITAL ELECTRONICS LAB

Paper Code: 209

Credits: 02

Periods/week: 04

Max. Marks: 100

Objective: This lab is designed to introduce the students with binary arithmetic and working of various digital circuits used in computers. It will be covering concepts theory paper BCA 205 as given below.

- 1) To study characteristics of AND/NAND/OR function and to verify $f=a.(b+c)$
- 2) Verify operation of 16 to 1 Multiplexer
- 3) Verify operation of De-multiplexer
- 4) To study operation of BCD to Decimal decoder
- 5) To study operation of seven segment decoder
- 6) Verify the operation of S-R flip flop
- 7) Verify operation of J-K flip flop
- 8) Study and verify operation of Ex-OR and even parity checker
- 9) Study and verify operation of odd parity checker
- 10) Study left and right shift registers
- 11) Study of ring counter

SEMESTER-III
PAPER-I : OUR ENVIRONMENT (FOUNDATION)
Paper Code: FES 300

Credits: 02
Periods/Week: 02
Max. Marks: 100

Objective: This module is designed to help students to know about the fundamental concepts of environment.

UNIT-I Definition, Scope and Importance of Environmental Studies [No. Of Hrs: 3]

- Definition of Environment
- Scope of Environmental Studies and its applications
- Importance with respect to the society
- Relationship of Environmental Studies with other subjects (Multidisciplinary nature of Environment)

UNIT-II Ecosystem: Structure and Function [No. Of Hrs:6]

- Concept of Ecosystem
- Biotic and abiotic components of ecosystem
- Food Chain and Food Web
- Ecological Pyramids
- Energy Flow

UNIT-III Environmental Pollution [No. Of Hrs:8]

- Water Pollution: Definition, sources and effects
- Air Pollution-Definition, sources and effects
- Noise Pollution-Definition, sources and effects

UNIT-IV Energy and Environment [No. Of Hrs: 8]

- Solar Energy and its uses
- Wind Energy
- Tidal Energy
- Hydro Power

UNIT-V Environment and Human Health [No. Of Hrs: 5]

- Water and airborne Diseases; Potential and widespread effects, water and airborne bacteria and viruses,
- public awareness of sanitation and hygiene issues and role of NGOs
- WHO and other bodies and their role in public health projects development,

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Bharucha Erach, "The Biodiversity of India", Mapin Publishing Pvt. Ltd., Ahmedabad -380 013, India, Email:mapin@icenet.net
2. Agarwal, K.C., 2001 "Environmental Biology", Nidi Publ. Ltd. Bikaner.
3. Jha Latika and Shailendra, "Environmental Studies", CBH publications, Jaipur
4. Singh, R.B., Thakur, D.K. and Chauhan, J.P.S., RBD publications, Jaipur

REFERENCES:

1. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, "Environmental Encyclopedia", Jaico Publ. House, Mumbai.
2. Townsend C., Harper J, and Michael Begon, "Essentials of Ecology", Blackwell Science
3. Odum, E.P. 1971. "Fundamentals of Ecology" W.B. Saunders Co. USA.

PAPER-II : DATABASE MANAGEMENT SYSTEMS

Paper Code: BCA-302

Credits: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module is designed to help students to know about the fundamental concepts of database management.

UNIT – I

[No. Of Hrs: 10]

Introduction: Database, Database System Applications, Database Systems versus File Systems, View of Data, Data abstraction, Levels of architecture, Data Independence, Data Models, Database Languages, Database Users and Administrators, History of Database Systems.

UNIT – II

[No. Of Hrs: 12]

Entity-Relationship Model: Basic concepts, Constraints, Keys, Design Issues, E-R diagram, Weak Entity Sets, Extended E-R features, Design of an E-R Database Schema, Reduction of an E-R Schema to tables.

UNIT – III

[No. Of Hrs: 15]

Relational Model: Structure, The Relational Algebra, and Extended Relational-Algebra Operations, Modification of the Database, Introduction to Views, Introduction to the Tuple Relational Calculus and the Domain Relational Calculus.

SQL: Basic Structure, Set Operations, Aggregate Functions, Null Values, Nested Sub queries, Joined Relations.

UNIT – IV

[No. Of Hrs: 10]

Relational-Database Design: First Normal Form, Pitfalls in Relational-Database Design, Functional Dependencies, Decompositions, Boyce-Codd Normal Form, Third Normal Forms.

UNIT – V

[No. Of Hrs: 13]

Distributed database concepts, Distributed database concepts, Parallel Vs Distributed technology, Advantages of Distributed databases, Additional functions of Distributed databases, Overview of Client-Server architecture and its relationship to Distributed databases.

Storage and File Structure: Overview of Physical Storage Media, Magnetic Disks, RAID, Tertiary Storage, Storage Access.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. Abraham Silberschatz, Henry Korth, S. Sudarshan, "Database Systems Concepts", 4th Edition, McGraw Hill, 1997.

REFERENCES:

1. Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan Kaufmann Publishers, 1993.
2. R. Elmars and SB Navathe, "Fundamentals of Database Systems", Addison Wesley, 4th Ed., 2004
3. A. K. Majumdar, P. Battacharya, "Data Base Management Systems", TMH, 1996.
4. Bipin Desai, "An Introduction to database Systems", Galgotia Publications, 1991.

RROPOSED COVERAGE:

UNIT-I [Chapter 1 : 1.1-1.6 & 1.10 Essential Readings(1)]

UNIT-II [Chapter 2 : 2.1-2.9 Essential Readings(1)]

UNIT-III [Chapter 3 : 3.1-3.7, Chapter 4 : 4.2-4.6 & 4.10 Essential Readings(1)]

UNIT-IV [Chapter 7 : 7.1-7.4,7.6,7.7 Essential Readings(1)]

UNIT-V [Chapter 24 : 24.1 & 24.6 Reference(2), Chapter 11: 11.1-11.5 Essential Reading(1)]

PAPER-III : PROBABILITY AND STATISTICS
Paper Code: BCA 302

Credits: 04
Periods/week: 04
Max. Marks: 100

Objective: This paper is designed to understand the role of statistics in computers.

UNIT - I

[No. of Hrs: 13]

Frequency distributions, Relative frequency distributions, cumulative frequency distributions, Graphical representation of data (Histograms, Frequency Polygons, Smoothed frequency curves and Ogives), Measures of Central Tendency, Measure of Dispersion, Moments, Skewness and Kurtosis (simple questions).

UNIT - II

[No. of Hrs: 12]

Basic ideas of Permutation and Combination, Theory of Probability, Law of total and compound probability, Conditional probability, Baye's theorem (simple question based on the theorem).

UNIT - III

[No. of Hrs: 12]

Random variables, discrete and continuous random variables, Distribution function, probability distribution function. Mathematical expectation, moment generating functions.

UNIT - IV

[No. of Hrs: 12]

Discrete Probability Distribution: Binomial and Poisson distributions, Relationship between Binomial and Poisson distributions with important properties and simple questions based on them.

Continuous Probability Distribution: Normal distribution and its properties, Area under normal property curve(simple questions).

UNIT - V

[No. of Hrs: 11]

The principle of least squares and curve fitting, fitting of straight line and second degree parabola.

Correlation: Definition and types, methods of studying correlation- Karl Pearson's coefficient of correlation and rank Correlation

Linear Regression - Definition, Fitting of two lines of regression, Regression coefficients

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. S.C. Gupta and V.K. Kapoor, “Fundamentals of Mathematical Statistics”, Eleventh edition, S. Chand & Company, 2002.
2. Ross Sheldon M., “Introduction to the Theory of Probability”, Elsevier Publication.

REFERENCES:

1. A.M.Goon, M.K.Gupta and B.Das Gupta, “Fundamental of Statistics” Vol I, Calcutta University Press
2. B.L. Agarwal, “Basic Statistics”, New Age Publications

PROPOSED COVERAGE:

UNIT-I	[Chapter 2 : References(2), Chapter 2 : Essential Readings(1)]
UNIT-II	[Chapter 3: Essential Readings(1)]
UNIT-III	[Chapter 5 & 6: Essential Readings(1)]
UNIT-IV	[Chapter 8 & 9: Essential Readings(1)]
UNIT-V	[Chapter 10 & 11: Essential Reading(1); Reference(1)]

PAPER-IV : OBJECT ORIENTED PROGRAMMING THROUGH ‘C++’

Paper Code: BCA 303

Credits: 04

Periods /Week: 04

Max. Marks: 100

Objective: This module is designed to acquaint the students with the basics of C++ programming language.

UNIT – I

[No. of Hrs:15]

Introduction to C++, C++ Standard Library, Header Files, Inline Functions, References and Reference Parameters, Default Arguments and Empty Parameter Lists, Unary Scope Resolution Operator, Function Overloading, Function Templates.

C++ Classes and Data Abstraction: Introduction, Implementing a Time Abstract Data Type with a Class, Class Scope and Accessing Class Members, Separating Interface from Implementation, Controlling Access to Members, Access functions and Utility functions, Initializing Class Objects, Constructors, Using Default Arguments with Constructors, Using Destructors, calling Constructors and Destructors, Using Data Members and Member Functions, Returning a Reference to a private Data Member, Assignment by Default Memberwise Copy, Software Reusability.

UNIT – II

[No. of Hrs:14]

C++ Classes: Introduction, const (Constant) Objects and const Member Functions, Composition , friend Functions and friend Classes, this pointer, Dynamic Memory Allocation (new and delete), static Class Members, Data Abstraction and Information Hiding.

C++ Operator Overloading: Introduction, Fundamentals of Operator Overloading, Restrictions on Operator Overloading, Operator Functions, Friend Functions, Overloading Stream-Insertion and Stream-Extraction Operators, Overloading Unary Operators, Overloading Binary Operators. Converting between Types, Overloading ++ and --.

UNIT – III

[No. of Hrs:10]

C++ Inheritance: Introduction, Base Classes and Derived Classes, Protected Members, Casting Base-Class pointers to Derived-Class pointers, Using Member Functions, Overriding Base-Class Members in a Derived-Class, Public, Protected and Private Inheritance, Direct Base Classes and Indirect Base Classes, Using Constructors and Destructors in Derived Classes, Implicit Derived Class Object to Base-Class Object Conversion.

UNIT – IV

[No. of Hrs:10]

C++ Virtual Functions and Polymorphism: Introduction, Type Fields and **switch** Statements, Virtual Functions, Abstract Base Classes and Concrete Classes, Polymorphism, New Classes and Dynamic Binding, Virtual Destructors.

C++ Templates: Introduction, Class Templates, Nontype Parameters, Templates and Inheritance, Templates and friends, Templates and static Members

UNIT – V

[No. of Hrs:11]

C++ Exception Handling: Introduction, use of Exception Handling, Other Error Handling Techniques, Basics of Exception handling – Try block, Throwing, catching and Rethrowing an Exception, Exception Specifications, Processing Unexpected Exceptions, Constructors, Destructors and Exception Handling, Exceptions and Inheritance.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. H.M.Deitel & P.J.Deitel, “How to program in ‘C’”, 3rd Edition, Pearson Education.

REFERENCES:

1. A.R.Venugopal, Rajkumar, T. Ravishanker, “Mastering C++”, TMH, 1997.
2. Yashwant Kanetkar , “Let us C++”, BPB Publications
3. R. Lafore, “Object Oriented Programming using C++”, Galgotia Publications, 2004.
4. D . Parsons, “Object Oriented Programming with C++”, BPB Publication.
5. Schildt Herbert, “C++: The Complete Reference”, 4th Ed., Tata McGraw Hill, 1999.
6. S. B. Lippman & J. Lajoie, “C++ Primer”, 3rd Edition, Addison Wesley, 2000.

PROPOSED COVERAGE:

- UNIT – I [Chapter 15 & 16: Essential Reading(1)]
UNIT – II [Chapter 17 & 18 Essential Reading(1)]
UNIT – III [Chapter 19: 19.1-19.10 Essential Reading(1)]
UNIT – IV [Chapter 20 and 22 Essential Reading(1)]
UNIT – V [Chapter 23: 23.1- 23.10,23.12,23.13 Essential Reading(1)]

PAPER-V : PRINCIPLES OF PROGRAMMING LANGUAGES

Paper Code: BCA 304

Credits: 04

Periods/week: 04

Max. Marks: 100

Objective: This course is focused on the study of general language-design and evaluation concepts.

UNIT - I

[No. Of Hrs: 11]

Preliminaries: Reasons for studying concepts of Programming languages, Programming domains, Language evaluation criteria, Influences on language design, Language categories, and design trade-offs, Implementation Methods, Programming Environments.

Evolution of the Major Programming Languages (Historical Background & Design Process): Pseudocodes, IBM 704 and FORTRAN, LISP, ALGOL 60, COBOL, BASIC, PL/I, APL, SIMULA 67, ALGOL 68, Prolog, Ada, Smalltalk, C++, Java.

UNIT – II

[No. Of Hrs: 12]

Describing Syntax & Semantics: Introduction, General Problem & Formal Methods, Recursive Descent Parsing, Attribute Grammars, Dynamic Semantics.

UNIT – III

[No. Of Hrs: 13]

Names, Bindings, Type Checking, and Scopes: Introduction, names, variables, concept of binding, type checking, strong typing, type compatibility, scope & lifetime, referencing environments, named constants, variable initialization.

Data Types: Introduction, Primitive data types, character string types, user-defined ordinal types, array types, associative arrays types, record types, union types, set types, pointer types.

UNIT - IV

[No. Of Hrs: 12]

Expressions and Assignment Statements: Introduction, Arithmetic expressions, overloaded operators, type conversions, Relational & Boolean expressions, short-circuit evaluation, assignment statements, mixed-mode assignment.

Statement Level Control structures: Introduction, compound, selection & iterative statements, unconditional branching.

UNIT – V

[No. Of Hrs: 12]

SubPrograms: Introduction, Fundamentals, design issues, Local referencing environment, Parameter passing Methods, separate & independent compilation, design issues for functions, coroutines.

Abstract Data Types: Concept of abstraction, encapsulation, introduction to abstraction, design issues.

Object Oriented Programming: Introduction, basic concepts, design issues for object-oriented languages.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. Robert W. Sebesta , “Concepts of Programming Languages”, Pearson Education Asia, 2000.

PROPOSED COVERAGE:

UNIT-I [Chapter 1-2: Essential Reading(1)]

UNIT-II [Chapter 3 : Essential Reading(1)]

UNIT-III [Chapter 4-5 : Essential Reading(1)]

UNIT-IV [Chapter 6,7 : 7.1-7.5 Essential Reading(1)]

UNIT-V [Chapter 8 : 8.1-8.5, 8.9, 8.10, 8.13, Chapter 10 : 10.1-10.4 , Chapter 11: 11.1
11.3, Chapter 11: 11.1-11.3: Essential Reading(1)]

PAPER-VI: SYSTEM ANALYSIS AND DESIGN

Paper Code: BCA 305

Credits: 04
Periods/week: 04
Max. Marks: 100

Objective: This course is focused on the study of tools and methodologies used for developing Computer based Information Systems.

UNIT - I

[No. Of Hrs: 11]

Introduction to System, Analysis and Design: System definition and concepts—Characteristics of a system, elements of a system, types of systems-- Physical & Abstract systems, Open & Closed systems.

Business Information Systems— Definition, Categories, Types [Formal, Informal, Computer-based (MIS & DSS)].

Classification of Business Information System – Centralized (data warehousing & data mining) & Distributed Systems (client-server).

UNIT – II

[No. Of Hrs: 13]

Different users in a system-- Programmers, Computer Operators, End Users. System Analyst – Role of system analyst.

System Development Life Cycle(SDLC): Introduction to SDLCs; its various phases – Feasibility Study, Analysis, Design, Implementation, Post- Implementation & Maintenance. Different types of SDLC -- Linear or Waterfall Cycle, Problems with Linear Life Cycle. Structured SDLC. Prototyping.

UNIT – III

[No. Of Hrs: 15]

System Analysis: Data and Fact Gathering Techniques—Review of literature, procedures & forms, On-Site observation, Interviews & Questionnaires; Feasibility study (considerations, steps & report).

Introduction & Definition of Structured Analysis: Tools of Structured Analysis: DFD, Data Dictionary, Decision Tree & Structured English, Decision Tables, Pros & Cons of Each Tools.

Entity Relationship Analysis: Attributes, Relation, Relationship Cardinality, Building E-R Models, and Relationship between DFD & ERD.

UNIT - IV

[No. Of Hrs: 11]

System Design: Process & stages of System Design, Logical & physical, Design Methodologies, Major Development activities, Input/Output & forms design, Structure charts, Structure charts & Structure Design, Conversion from data flow diagrams to structure charts.

UNIT – V

[No. Of Hrs: 10]

System Testing – Introduction, Need, Nature of test data, Test Plan, Types of system testing. System Implementation & Software Maintenance.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. E. M Awad , “System Analysis and Design”, Galgotia Publications, 1995.
2. Igor Hawryszkiewycz, 4th edition, “Introduction to System Analysis and Design”, Prentice-Hall.

REFERENCES:

1. V. Rajaraman, “Analysis & design of Information Systems”, PHI
2. Philip L. Weaver, “Practical SSADM ver 4+ - A complete Tutorial guider”, Pitman Publishing, 1995.
3. Mark Lejk & David Deeks, “An Introduction to System Analysis Techniques”, PHI.
4. Don Yeates, Maura Shields & David Helmy, “System Analysis & Design”, Longman Group Limited, 1994.
5. Jeffrey L. Whitten, and Lonnie D. Bentley and Barlow, “Systems analysis and Design Methods” 4th edition, Tata McGraw-Hill.

PROPOSED COVERAGE:

Unit I: Chapter 1(Essential Reading 1); Chapter 1 (Essential Reading 2)

Unit II: Chapter 1 (Essential Reading 2); Chapter 2 (Essential Reading 1); Chapter 7 (Essential Reading 2)

Unit III: System Analysis Chapter 5 & 7 (Essential Reading 1); System Analysis Chapter 6 (Essential Reading 1); Chapter 9 (Essential Reading 2)

Unit IV: System Design Chapter 9 & 10 (Essential Reading 1); Chapter 18 (Essential Reading 2)

Unit V: System Implementation Chapter 12 & 13 (Essential Reading 1)

PAPER-VII : C++ PROGRAMMING LAB
Paper Code : BCA 306

Credits: 03

Periods/week: 06

Max. Marks: 100

Objective: In this laboratory paper, students will be making 'C++' programs based on theory paper BCA304.

Exercises given will be covering entire syllabi as follows:

1. Programs using Arithmetic Operators, Relational Operators, Logical operators.
2. Programs using Control Flow.
3. Programs defining Classes and Objects.
4. Programs based on Inheritance.
5. Programs using Operator Overloading and Function Overloading.
6. Programs based on Polymorphism.

PAPER-VIII : MINI PROJECT LAB
Paper Code: BCA 307

Credits: 03
Periods/week: 06
Max. Marks: 100

Objective : In mini project lab, the students shall develop a running software, using any front end design tool. They shall implement the concepts of a front end and a backend technology.

SEMESTER-IV

PAPER-I : ORGANIZATIONAL BEHAVIOUR

Paper Code: BCA 401

Credit: 02

Periods/Week: 02

Max. Marks: 100

Objective: This module aims at developing the general understanding of behaviour in an organization amongst the students.

UNIT-I

[No. of hrs:04]

Introduction: Meaning and nature of management; management systems and processes.

UNIT-II

[No. of hrs:10]

Behavioural Dynamics: Individual determinants of Organization Behaviour; Perceptions, Learning, Personality, Attitudes and Values.

UNIT-III

[No. of hrs:06]

Motivation; Stress and its management.

UNIT-IV

[No. of hrs:05]

Interactive Aspects of Organizational Behaviour; Analysing inter-personal relations; Group Dynamics.

UNIT-V

[No. of hrs:05]

Management of Organizational Conflicts; Leadership Styles.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Luthans Fred, "Organizational Behaviour", McGraw Hill Publications, 1998.

REFERENCES:

1. Robbins (4th ed.), "Essentials of Organizational Behaviour", Prentice Hall of India Pvt. Ltd., New Delhi, 1995.
2. Hersey and Blanchard (6th ed.), "Management of Organizational Behaviour: Utilising Human Resources", Prentice Hall of India Pvt. Ltd., New Delhi, 1996.
3. Dwivedi, R. S., "Human Relations and Organizational Behaviour: A Global Perspective", Macmillan India Ltd., Delhi, 1995.
4. Arnold, John, Robertson, Ivan t. and Cooper, Cary, l., "Work Psychology: Understanding Human Behaviour In The Workplace", Macmillan India Ltd., Delhi, 1996.

PAPER-II : OPERATING SYSTEMS

Paper Code: BCA 402

Credit: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module aims at making students learn about basic concepts of operating systems.

UNIT – I

[No. of hrs. 12]

What is an Operating System, Simple Batch Systems, Multiprogrammed Batched Systems, Time-Sharing Systems, Personal-Computer Systems, Parallel Systems, Distributed Systems, and Real-Time Systems.

UNIT – II

[No. of hrs. 08]

Operating-System Structures: System Components, Operating System Services, System Calls, System Structure, Virtual Machines.

Process Management: Process Concept, Process Scheduling, Operation on Processes.

UNIT – III

[No. of hrs. 15]

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms (FCFS, SJF, Priority, Round-Robin, Multilevel Queue, Multilevel Feedback Queue) Multiple-Processor Scheduling.

Process Synchronization: Background, The Critical-Section Problem, Introduction to Semaphores.

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

UNIT – IV

[No. of hrs. 15]

Memory Management: Background, Logical versus Physical Address space, Swapping, Contiguous allocation (fragmentation), Paging, Segmentation.

Virtual Memory: Background, Demand Paging, Page Replacement, Page-replacement Algorithms (FIFO, Optimal, LRU, Counting)

UNIT –V

[No. of hrs. 10]

File Management: File Concepts (Operations & Attributes), Access Methods, Directory Structure, File System Structure, Allocation Methods (Contiguous Allocation, Linked Allocation, Indexed Allocation).

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. A. Silberschatz and P.Galvin, "Operating System Concepts", Addison-Wesley, 5th Ed., 2001

REFERENCES:

1. Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000
2. Madnick E., Donovan J., "Operating Systems", Tata McGraw Hill, 2001
3. Achyut S. Godbole, "Operating Systems", Tata Mc-Graw Hill Publishing Company Limited 2000.
4. Gary Nutt, "Operating System A Modern Perspective (Second Edition)", Pearson Education 2000.

PROPOSED COVERAGE:

Unit I [Chapter 1:1.1-1.8]

Unit II [Chapter 3: 3.1-3.1.5, 3.2-3.3.1, 3.5, 3.6, Chapter 4: 4.1-4.3.2]

Unit III [Chapter 5: 5.1-5.4, Chapter 6: 6.1-6.2.2, 6.4, Chapter 7: 7.1-7.7.2]

Unit IV [Chapter 8: 8.1-8.6.3, Chapter 9: 9.1, 9.2, 9.4, 9.5.3, 9.5.5]

Unit V [Chapter 10:10.1-10.2.2, 10.3-10.3.5, Chapter 11:11.1-11.2.3]

PAPER-III : OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Paper Code: BCA 403

Credits: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module is designed to acquaint the students with the concept of Java programming language.

UNIT-I

[No. of Hrs:10]

Java Programming: Introduction to object oriented programming, Difference between C, C++ and Java, Java features, JVM, simple java program, command line argument, Data types, type casting, operators (Arithmetic, increment, decrement, relational, logical, bit wise, conditional) and expressions, Mathematical functions

UNIT – II

[No. of Hrs:12]

Decision making and branching (if...else, else if, switch), looping, classes, class hierarchies, objects and methods, constructors, wrapper classes, nesting of methods, overriding methods, final class, visibility control, Arrays, strings and vectors.

UNIT – III

[No. of Hrs:12]

Inheritance, interfaces, packages, multithreaded programming, extending thread, life cycle of thread, using thread methods, thread priority, synchronization.

UNIT – IV

[No. of Hrs:14]

Exception-Handling fundamentals, Exception types, try, catch, throw, finally, creating exception sub classes Java applet programming, Applet life cycle, applet tag, running the applet, passing parameters to applets, Getting input from the user into applet.

UNIT – V

[No. of Hrs:12]

AWT controls (Button, Labels, Combo box, list and other Listeners), string handling (only main functions), graphic programming (line, rectangles, circle, and ellipses).

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. H.Schildt, "The complete Java 2 reference", Tata McGraw-Hill Fourth Edition
2. E. Balagurusamy, "Programming with Java", BPB Publications

REFERENCES:

1. Deitel & Deitel "How to Program C Introducing C++ and Java"(Third Edition) Pearson Edition
2. Arnold,Gosling, " The Java Programming Professional 2000", Addison Wesley Publication
3. C.Thomas wu, "An introduction to oop with Java", TMH
4. Zukowski, " Mastering java 2 ", BPB Publications

PROPOSED COVERAGE:

- UNIT – I [Chapter1,2,3,4 Essential Reading (1)],[Chapter1-4, 5: 1.1, 1.3, 2.2, 2.3, 2.9, 3.5, 4.4, 4.7, 4.9, 5.1-5.5.15 Essential Reading (2)]
- UNIT – II [Chapter 5,6,7 Essential Reading (1)],[Chapter 6, 7, 8, 9: 6.2-6.8,7.2-7.5,8.2-8.10,8.12-8.17,9.1-9.7 Essential Reading (2)]
- Unit – III [Chapter 8,9,11 Essential Reading (1)], [Chapter 8,10,11,12: 8.11,10.2-10.5,11.2,11.3,11.5-11.8,12.2-12.10 Essential Reading (2)]
- Unit – IV [Chapter 10,12 Essential Reading (1)], [Chapter 13,14:13.2-13.8,14.1-14.16 Essential Reading (2)]
- Unit – V [Chapter 21, 22,13 Essential Reading (1)],[Chapter 15:15.2-15.4 Essential Reading (2)] , [Chapter 28: 28.2, 28.5 References (1)]

PAPER-IV : SCRIPTING LANGUAGES
Paper Code: BCA 404

Credits: 04

Periods / Week: 02

Max. Marks : 100

Objective: This module is designed to help students for creating dynamic web sites.

UNIT I

[No. Of Hours: 10]

JavaScript: Introduction, Advantages of using JavaScript, Writing JavaScript ino HTML, Basic Programming Techniques: Data Types and Literals, Creating variables, JavaScript Array, Operators and Expressions (Airthematic, Logical, Comparison, String and Assignment operator) in JavaScript .

UNIT II

[No. Of Hours: 10]

JavaScript Programming Constructs: Conditional checking (if-then-else statement), Loops (for loop and While loop), Functions in JavaScript (Built-in functions and User defined functions) Dialog Boxes (Alert, Prompt and Confirm Dialog Box), Handling Web Page Events using JavaScript.

UNIT III

[No. Of Hours: 15]

Creating Frames in JavaScript : accessing different frames, storing and using information in a frame.

Forms used by a Website, Form Object's Methods, Form Actions and Form Validation.

UNIT IV

[No. Of Hours: 15]

Perl Language: Introduction, Basic of Perl , Perl Strings, Variables, Arrays, Running the program, Comments, Basic Airthematic Operations, Operators , Auto Increment and Auto Decrement operator , Relational Operators and Regular Expressions.

UNIT V

No. Of Hours: 10]

Control Structures in Perl: if-else, Unless. Loops- While and Until, For and For each.

Built-in-Functions- String Functions, Array functions, Mathematical and Time function.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Ivan Bayross, "HTML, DHTML, Javascript, Perl-CGI", BPB Publications.
2. Doug Sheppard, "Beginner's Introduction to Perl", O' Reilly Media.
3. Website: <http://www.comp.leeds.ac.uk>

REFERENCES::

1. James Jaworski," Mastering JavaScript & Jscript", BPB
2. John Pollock, "JAVASCRIPT -A Beginner's Guide", Osborne/TMH

PROPOSED COVERAGE:

UNIT – I [Chapter 8: Essential Reading 1]

UNIT – II [Chapter 8 & Chapter 9: Essential Reading 1]

UNIT – III [Chapter 10: Essential Reading 1, Part II Chapter 6: References (1)]

UNIT – IV [Chapter 14, 15 & 18: Essential Reading 1; Essential Reading 2]

UNIT – V [Chapter 15 & 16: Essential Reading 1]

PAPER-V : DATA NETWORKS

Paper Code: BCA 405

Credits: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module will help students to learn various Data Communication and networking concepts.

UNIT – I

[No. of Hrs: 12]

Data Communications: Components, Data Representation and Data flow; Networks: Distributed Processing, Network Criteria, Network Models, Categories of networks and Internetwork; Internet and Protocols and Standards.

Network Models: Layered tasks, the OSI model, Layers in the OSI Model, TCP/IP protocol Suit, Addressing.

UNIT – II

[No. of Hrs: 12]

Data and Signals: Analog and Digital Data, Analog and Digital Signals, Periodic and Non periodic Signals, Transmission impairment, Data rate limits and Performance.

Digital Transmission: Digital to Digital Conversion, Analog to Digital Conversion and Transmission modes.

UNIT – III

[No. of Hrs.: 15]

Multiplexing: FDM, WDM, Synchronous TDM and Statistical TDM.

Transmission Media: Guided media and Unguided media (Wireless Transmission).

Switching: Circuit switched networks, Datagram networks, Virtual Circuit networks and structure of a switch.

UNIT – IV

No. of Hrs.: 10]

Error Detection and Correction: Introduction, Block coding, Linear block codes, cyclic codes, Checksum.

UNIT – V

[No. of Hrs.: 11]

Data Link control : Framing, Flow and Error Control, Protocols, Noiseless channels, Noisy channels.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Behrouz A. Forouzan, “Data Communication and Networking”, 4th edition, Tata Mc Graw Hill, 2006.

REFERENCES::

1. A. S. Tanenbaum, “Computer Networks”, Pearson Education Asia, 4th Ed., 2003.
2. William Stallings, “Data and computer communications”, Pearson education Asia, 7th Ed., 2002.

PROPOSED COVERAGE:

UNIT I [Chapter 1: 1.1-1.4, Chapter 2: 2.1-2.5 Essential Reading 1]

UNIT II [Chapter 3: 3.1&3.4-3.6, Chapter 4: 4.1-4.3 Essential Reading 1]

UNIT III [Chapter 6:6.1, Chapter 7: 7.1-7.2, Chapter 8: 8.1-8.4 Essential Reading 1]

UNIT IV [Chapter 10 Essential Reading 1]

UNIT V [Chapter 11: 11.1-11.5 Essential Reading 1]

PAPER-VI : COMPUTER ORIENTED NUMERICAL METHODS

Paper Code: BCA 406

Credits: 04

Periods/week: 04

Max. Marks: 100

Objective: This module is designed to help students to know about the concepts of numerical methods and how they are useful in the study of computers.

UNIT - I

[No. of Hrs: 09]

Computer Arithmetic: Introduction, Floating point representation of numbers, Arithmetic operation with normalized floating point numbers, Consequences of normalized floating point representation of numbers, errors in numbers, binary representation of numbers.

UNIT - II

[No. of Hrs: 12]

Iterative Methods: Introduction, Beginning an iterative method, Method of successive bisection, Method of false position, Newton-Raphson iterative method, Secant method, Method of successive approximation, Comparison of iterative methods.

UNIT - III

[No. of Hrs: 13]

Solution of simultaneous Algebraic equations: Gauss elimination method, Pivoting, Ill conditioned equations, Refinement of the solution obtained by Gaussian Elimination, Gauss-Seidel Iterative Method, Algorithm to implement Gauss-Seidel method, Comparison of Direct and Iterative Methods.

UNIT - IV

[No. of Hrs: 11]

Interpolation: Introduction, Lagrange interpolation, Difference tables, Truncation error in interpolation, Spine interpolation.

Numerical Differentiation and Integration: Introduction, Formulae for numerical differentiation, Numerical Integration.

UNIT - V

[No. of Hrs: 15]

Numerical Differentiation and Integration: Simpson's rule, Algorithm for Integration of Tabulated Function.

Numerical solution of Differential Equations: Euler's method, Runge-Kutta method, Runge-Kutta Fourth Order Formula, Predictor-Corrector Method, Comparison of Predictor-Corrector and Runge-Kutta Methods.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. V. Rajaraman, "Computer Oriented Numerical Methods" 3rd Edition, Prentice Hall of India Pvt. Ltd.

REFERENCES:

1. E. Balagurusami, "Numerical Methods" Tata McGraw Hill, 1988.
2. Schaum's Series, "Numerical Methods", TMH
3. S.S. Sastry, "Introductory Methods of Numerical Analysis", second ed., Prentice Hall of India Pvt. Ltd, 1997.

PROPOSED COVERAGE:

UNIT – I [Chapter 2: 2.1, 2.2, 2.3, 2.4, 2.6, 2.7 Essential Reading (1)]

UNIT – II [Chapter 3: 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7 Essential Reading (1)]

UNIT – III [Chapter 4: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8 Essential Reading (1)]

UNIT – IV [Chapter 5: 5.1, 5.2, 5.3, 5.4, 5.5, Chapter 8: 8.1, 8.2, 8.3, Essential Reading (1)]

UNIT – V [Chapter 8: 8.4, 8.6, Chapter 9: 9.2, 9.4, 9.5, 9.6, 9.8, Essential Reading (1)]

PAPER-VII : JAVA PROGRAMMING LAB
Paper Code: BCA 407

Credits: 03

Periods /Week: 06

Max. Marks:100

***Objective:** To make students familiar with the practical implementation of 'Java' programs covering theory paper BCA 403 and the student will also learn to implement computer oriented numerical methods using Java as given below:*

- 1- Simple Java programs using variables, keywords and simple operations
- 2- Programs based on operators
- 3- Branching statement programs using Java
- 4- Exercises based on Looping (while, do while, for)
- 5- programs on classes, objects ,constructor, nested classes
- 6- Programs based on arrays and strings
- 7- Programs on Inheritance, interfaces, and packages.
- 8- exercises on multithreaded programming
- 9- Applet programs
- 10- AWT programs exercises
- 11- Programs based on graphics
- 12- Data base connectivity with Java programs (JDBC)
- 13- Exercise to find the root by bisection method.
- 14- Exercise to find the root by Newton Raphson method.
- 15- Exercise to find the root by secant method.

PAPER-VIII : SCRIPTING LANGUAGES LAB
Paper Code: BCA 408

Credits: 03

Periods/week: 06

Max. Marks: 100

Objective: Designing Web pages by covering concepts studied in theory paper BCA 404.

Web page should be designed with following features:

- HTML Basic Tags (html/head/title/body/B/I/U/BR/HR)
- Form Validations using Javascript
- Functions
- Conditional and Control Statements using JavaScript
- Basic Perl Programs

PAPER-IX : SEMINAR
Paper Code: 409

Credits: 02
Periods/week: 02
Max. Marks: 100

Objective: The students will present a seminar on latest trends in the field of Information Technology. This will help the student in enhancing their communication as well as presentation skills and expand their area of knowledge. It will make them aware of ongoing developments in the related domain. This will make them more analytical & judgmental.

SEMESTER-V

PAPER-I : GENERAL STUDIES (FOUNDATION)

Paper Code: FGS 500

Credit: 04

Periods/Week: 04

Max. Marks: 100

PAPER-II : SOFTWARE ENGINEERING

Paper Code: BCA 501

Credit: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module will help the student in learning various factors & metrics involved in software development process.

UNIT-I

[No. of hrs. 12]

Software Engineering Fundamentals: Software, The changing nature of software, Software engineering – A layered approach

The Software Process: Software Processes (processes, projects & products, component), Characteristics of Software Processes, Software Development Process, Waterfall Model, Prototyping, Iterative Enhancement Model, The Spiral Model.

Software Requirement Analysis & Specification: Need, Characteristics & Components

UNIT-II

[No. of hrs. 15]

Software Project Planning: Cost Estimation- Uncertainties in Cost Estimation, Building Cost Estimation Models, On Size Estimation, COCOMO Model.

Project Scheduling: Average Duration Estimation, Project Scheduling & Milestones.

Quality Assurance Plans: Verification & Validation, Inspection & Reviews.

Project Monitoring Plans: Time Sheets, Reviews, Cost Schedule Milestone Graph, Earned Value Method, Unit Development Folder.

UNIT-III

[No. of hrs. 12]

Design Engineering: Design Process & Design Quality, Design Concepts (abstraction, architecture, patterns, modularity, information hiding, functional independence, refinement, refactoring, and design classes), The Design Model (data design elements, architectural design elements, interface design elements, component-level design elements, deployment-level design elements)

UNIT-IV

[No. of hrs. 11]

Testing Strategies & Tactics: A strategic approach to software testing, Strategic issues, Software testing fundamentals, Test characteristics, Test Strategies for conventional software-(Unit Testing, Integration testing, Validation Testing, System testing, Black-Box testing, White Box testing. The art of debugging (process & strategies)

UNIT-V

[No. of hrs. 10]

Risk Management: Overview, Assessment, Control.

Software Reliability: Measures of reliability & availability, Software safety.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

- 1) Pankaj Jalote , “An Integrated Approach To Software Engineering (Second Edition)”, Springer Publications
- 2) Roger S. Pressman, “Software Engineering (A Practitioner’s Approach) (Sixth Edition)”, Mc-Graw Hill International

REFERENCES:

1. Girdhari Singh, "Software Engineering", Genius Publications.

PROPOSED COVERAGE:

UNIT-I	[Chapter 1(From1.2 to 1.3); Chapter 2 (2.1) {Essential reading 2} Chapter 2 (From 2.1 to 2.3.5) {Essential reading 1} Chapter 3 (3.1, 3.1.1, 3.3, 3.3.1, 3.3.2) {Essential reading 1}]
UNIT-II	[Chapter 4 (4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.2, 4.2.2, 4.2.3, 4.5, 4.5.1, 4.5.2, 4.6, 4.6.1, 4.6.2, 4.6.3, 4.6.4, 4.6.5) {Essential reading 1}]
UNIT-III	[Chapter 9 (9.2, 9.3, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.9); (9.4, 9.4.1, 9.4.2, 9.4.3, 9.4.4, 9.4.5 {Essential reading 2}]
UNIT-IV	[Chapter13 (13.1, 13.1.1, 13.1.2, 13.2); (13.3, 13.3.1, 13.3.2, 13.5, 13.6, 13.6.1, 13.6.2, 13.6.3, 13.6.4); (13.7, 13.7.1, 13.7.3, 13.7.4), Chapter 14 (14.1); (14.2, 14.3) {Essential reading 2}]
UNIT-V	[Chapter 26 (26.7, 26.7.1, 26.7.2) {Essential reading 2} Chapter 4 (4.7, 4.7.1, 4.7.2, 4.7.3) {Essential reading 1}]

PAPER-III : INTERNET & TCP/IP

Paper Code: BCA 502

Credits: 04

Periods/Week: 04

Max. Marks: 100

Objective: This module will help students to learn various TCP/IP and networking concepts.

UNIT – I **[No. of Hrs: 14]**

Network Layer (Logical Addressing): IP v4 – Address Space, Notations, Classful addressing, classless addressing and NAT, IP v6 – Structure and Address space.

Network Layer (Internet Protocol) : Internetworking- Need for Network layer, Internet as a Datagram Network, IPv4 – Datagram, Fragmentation, Checksum, Options, IPv6 – Advantages, Packet Format, Extension Headers, Transition from IPv4 to IPv6 – Dual Stack, Tunneling and Header Translation.

UNIT – II **[No. of Hrs: 13]**

Network Layer: Address Mapping, Error Reporting and Multicasting- ICMP, IGMP and ICMPv6.

Network Layer: Direct and Indirect Delivery, Forwarding Process and Techniques, Routing Table, Unicast Routing Protocols – Optimization, Intra and Inter domain Routing, Distance vector routing, Link state routing, Path vector routing.

UNIT – III **[No. of Hrs: 11]**

Process to process delivery- Client server paradigm, Multiplexing and Demultiplexing, connectionless versus connection oriented services, reliable versus unreliable, User Datagram Protocol- Ports , User Datagram, Checksum, UDP operation and its use, TCP- services, features and segment, TCP connection, Flow control, Error control and congestion control.

UNIT – IV **[No. of Hrs: 10]**

Domain Name System: Name Space (Flat and Hierarchical), Domain Name Space- Label, Domain name and Domain, Distribution of the Name Space: Hierarchy of Name Servers, Zone, Root Server and Primary and Secondary servers, DNS in the Internet – Generic, Country and Inverse Domains, Resolution- Resolver, Mapping Names to Addresses, Mapping Address to names, Recursive Resolution, Iterative Resolution and Caching, DNS messages(Header), Types of records (Question and Resource), Registrar, Dynamic DNS and Encapsulation.

UNIT – V **[No. of Hrs: 12]**

Remote Logging: Telnet, Electronic mail: Architecture, User Agent, SMTP, POP, IMAP and Web based mail, File Transfer Protocol and Anonymous FTP.

WWW and HTTP: Architecture-Client browser, server, URL and cookies, Web documents- Static , Dynamic and Active , HTTP- HTTP Transaction, Persistent and non-persistent connection and proxy server.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Behrouz A. Forouzan, “Data Communication and Networking”, 4th Edition, Tata Mc Graw Hill, 2006.

REFERENCES:

1. Behrouz A. Forouzan, “TCP/IP Protocol Suit”, 2nd Edition, Tata Mc Graw Hill.
2. Douglas Comer, “TCP/IP”, PHI

PROPOSED COVERAGE:

UNIT-I	[Chapter 19: 19.1-19.2, Chapter 20: 20.1-20.4]
UNIT-II	[Chapter 21: 21.1 – 21.4 &Chapter 22: 22.1 – 22.3]
UNIT-III	[Chapter 23:23.1 - 23.3]
UNIT-IV	[Chapter 25]
UNIT-V	[Chapter 26: 26.1-26.3]

PAPER-IV : RDBMS
Paper Code: BCA 503 (A)

Credits: 04
Periods/Week: 04
Max. Marks: 100

Objective: In this module student will learn various concepts in oracle i.e. they can design rich databases for various projects.

UNIT-I **[No. of Hrs: 12]**

Overview of Relational Database Design and Normalization till Third Normal Form.
Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.
Transaction Processing: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions.

Concurrency control techniques: Locking techniques for concurrency control, Concurrency control based on Timestamp ordering.

UNIT-II **[No. of Hrs: 10]**

Database Integrity and Security: Domain constraints, Referential Integrity, Introduction to Assertions, Need for Triggers, Security violation and Authorization.

Relational Database Management Systems: A historical perspective, Basic structure of Oracle System, Database structure and its manipulation in Oracle, storage organization in Oracle.

UNIT-III **[No. of Hrs: 12]**

ORACLE: Login Screen, Entering Name and Password, Data Types, Null values, comments, SQL command syntax.

SQL SELECT Statement, Displaying Table Structure (DESC command), using WHERE clause.
Operators: Relational operators, Logical operators.

Condition based on a range, list, pattern match.

Searching and Sorting: Searching for NULL (IS NULL), Sorting results (ORDER BY Clause), Sorting By Column Alias.

SQL Functions and Grouping: Types of SQL Function (Single Row/Multiple Row). Character Functions - Case Conversion (Lower, InitCap, UPPER); Character Manipulation (CONCAT, INSTR, LENGTH, LTRIM, RTRIM, SUBSTR, LPAD, RPAD); Numeric Functions - (ROUND, POWER, TRUNC, MOD, SIGN, SQRT); Date Functions - (LAST_DAY, MONTHS_BETWEEN, NEXT_DAY, ADD_MONTHS, ROUND, TRUNC).

Grouping result – GROUP BY command, HAVING Clause.

UNIT-IV **[No. of Hrs: 13]**

Views: Create view command, Retrieving Data from a View, Querying a View, Modifying a View, Sequence, Index, and Synonyms.

Managing Constraints: Creating constraints, Unique, Primary Key, Default, Check and Foreign Key, table constraints, Dropping constraints, enabling and disabling constraints, deferring constraints checks.

Changing data with DML commands: INSERT INTO command, inserting values through substitution, inserting NULL values, inserting dates, inserting data from other table, ALTER TABLE command, Adding columns, modifying data-type and size of a column, modifying data with update command, DELETE, DROP TABLE & DROP VIEW command.

Transaction Control Commands: COMMIT, ROLLBACK and SAVEPOINT.

Data Control Language Commands: Granting privileges, Revoking privileges.

Sub Queries: Concept of Sub-Query, Sub Query to Solve a Problem, Guidelines for Using Sub Queries, Types of Sub-Queries (Single Row and Multiple Row) and (Single Column and Multiple Column); Single Row Sub-Query and its Execution.

Displaying Data From Multiple Tables: Concept of Join, Result of Join, Cartesian Product and Generating Cartesian Product example using Mathematical Set), Types Of Joins, AND operator, Table Aliases.

UNIT-V

[No. of Hrs: 13]

Declaring Variables: About PL/SQL, PL/SQL Block Structure, Program Constructs, Types of Variables & its uses, Declaration, Naming Rules, Assigning Values to Variables, Keywords, Scalar Data types, Base Scalar Data Types, Scalar Variable Declaration, %TYPE attribute: for variable declaration, Declaring Boolean Variables, PL/SQL Record Structure, Referencing Non-PL/SQL variables, DBMS_OUTPUT.PUT_LINE.

Writing Executable Statements: PL/SQL Block Syntax and Guidelines, SQL functions in Code, SQL Functions in PL/SQL, PL/SQL Functions, Data type Conversion, Nested Blocks and Variable Scope, Operators in PL/SQL, Using Bind Variables, Programming Guidelines, Determining Variable Scope, SQL Statements in PL/SQL, Retrieving data, Manipulating Data using PL/SQL; Inserting, Updating and Deleting Data, Naming Conventions.

Writing Control Structures: Controlling PL/SQL Flow of Execution, IF statements, IF-THEN-ELSE Statement, Building Logical Conditions, Logic Tables, Boolean Conditions; Iterative Control: LOOP Statement, Basic Loop, FOR Loop, While Loop.

Creating Procedures: Overview of Procedures, Developing Stored Procedures and its Advantages, Creating a Stored Procedure, Procedure Parameter Modes, Creating Procedures with Parameters, IN and OUT parameters and Usage, DEFAULT Option for Parameters, Removing Stored Procedures;

SQL Cursor: Introduction to Cursors (Implicit and Explicit), Explicit Cursor Functions, Declaring, Opening and Closing the Cursor, Fetching data from the Cursor, Explicit Cursor Attributes, controlling multiple fetches, Cursors and Records, Cursor FOR Loops, Cursor FOR Loops using Sub Queries.

Triggers: Types of Triggers: Row-Level Triggers, Statement Level Triggers, BEFORE and AFTER Triggers, INSTEAD of Triggers, Valid Trigger Type, Trigger Syntax, Combining Trigger Types, Enabling and Disabling Trigger, Replacing Trigger, Dropping a Trigger.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. R. Elmasri and SB Navathe, “Fundamentals of Database Systems”, Addison Wesley, 3th Ed., 2000
2. Sumita Arora, “ Informatics Practices”, Dhanpat Rai & Co.

REFERENCES:

1. James R. Groff & Paul N. Weinberg, “The complete reference SQL”, Tata McGraw Hill.
2. Alexis Leon & Mathews Leon , “SQL a complete reference”, Tata McGraw Hill.
3. Abraham Silberschatz, Henry Korth, S. Sudarshan, “Database Systems Concepts”, 4th Edition, McGraw Hill International Edition, 1997.

PROPOSED COVERAGE :

UNIT-I [Chapter 7 : 7.1-7.4,7.6 & 7.7 References(3), Chapter 15 : 15.2-15.3, Chapter 19 : 19.1-19.3, Chapter 20 : 20.1 & 20.2 Essential Readings(1)]

UNIT-II [Chapter 6 : 6.1-6.5 References(3), Chapter 10 : 10.1-10.4 Essential Readings(1)]

UNIT-III [Chapter 14 : 14.1-14.5, Chapter 15 : 15.2.3-15.2.5,15.4, Essential Readings(2), Chapter 16 : excluding 16.3.4,16.3.5 Essential Readings(2)]

UNIT-IV [Chapter 18 : 18.4, Chapter 19 : excluding 19.3.1A,B,C,D, 19.4, 19.6.1C,D References(4)]

OR

PAPER-IV : GEOGRAPHICAL INFORMATION SYSTEMS

Paper Code: BCA 503 (B)

Credits: 04

Periods/week: 04

Max. Marks: 100

Objective: To make students familiar with the basic concepts of Geographical Information Systems.

UNIT – I

[No. of hrs: 12]

Geographical Information Systems: Introduction, Definition, Components of a GIS- computer systems, software, spatial data, data management and analysis procedures.

Spatial Data: Introduction, Maps and their influence on the character of spatial data, Spatial entities, projections, Spatial referencing, Thematic characteristics of spatial data, Other sources of spatial data (Census and survey data, Aerial photographs, Satellite images).

UNIT– II

[No. of hrs: 12]

Spatial data modelling: Introduction, Entity definition, Spatial data models, Spatial data structures (Raster and Vector), Modelling surfaces- Raster approach to Digital terrain modeling and Vector approach to digital terrain modeling, Modelling networks, Modelling the third dimension ,Modelling the fourth dimension.

Attribute data management: Introduction, Database approach, DBMS, Database data models, Creating a database (Linking spatial and attribute data), GIS database application, Further Developments in databases.

Unit– III

[No. of hrs: 14]

Data input and editing: - Introduction, Methods of data input, Data editing, Detecting and correcting errors, re-projections, transformation and generalization, edge matching and rubber sheeting, Integrated Database.

Data analysis: - Introduction, Measurements in GIS-lengths perimeters and areas, Queries, Reclassification, Buffering and neighbourhood functions, Integrating data – map overlay (vector and raster), Spatial interpolation, Analysis of surfaces – calculating slope and aspect, visibility analysis, Network analysis- shortest path problem, traveling salesperson problem, location allocation modeling, route tracing.

UNIT –IV

[No. of hrs: 10]

Analytical modeling in GIS : - Introduction, Process models – natural and scale analogue model, conceptual model, mathematical models, Process modelling and GIS. Modelling physical and environmental processes, Modelling human processes, Modelling the decision-making process, Problems with using GIS to model spatial processes.

UNIT – V

[No. of hrs: 12]

Output : from new maps to enhanced decisions : - Introduction to Output: from new maps to enhanced decisions, Maps as output, Non-cartographic output, Spatial multimedia, Mechanisms of delivery, GIS and spatial decision support, Conclusions, Further study

Data Quality Issues: Describing data quality and errors, sources of error in GIS, finding and modeling errors in GIS, managing GIS error,

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. I.Heywood, S.Cornelius, S.Carver, “An Introduction to Geographical Information Systems”, Prentice Hall of India.

REFERENCES :

1. Michael DeMers, “Fundamentals of Geographic Information Systems”, Second Edition, 2000 John Wiley and Sons.
2. Clarke, K.C., “Getting Started With Geographic Information Systems”, 4th ed. New Jersey: Prentice-Hall, 2003.
3. David L. Verbyla and Kang-tsung (Karl) Chang, “Processing Digital Images in GIS”, Onword Press, 1997.
4. P A Burrough & R A McDonnell, “Principles of Geographic Information Systems”, OUP, 1998

PROPOSED COVERAGE:

UNIT-I	[Chapter 1 & 2 from Essential Reading (1)]
UNIT-II	[Chapter 3 & 4 Essential Reading (1)]
UNIT-III	[Chapter 5 & 6 Essential Reading (1)]
UNIT-IV	[Chapter 7 Essential Reading (1)]
UNIT-V	[Chapter 8 & 10 Essential Reading (1)]

PAPER-V : INTRODUCTION TO LINUX

Paper Code: BCA 504

Credits: 04
Prds/week: 04
Max. Marks: 100

Objective: This module is designed to introduce the students with the most powerful operating system and with its utilities i.e. Commands, Shell Programming, Administrative Concepts

UNIT-I **[No. of Hrs.: 9]**

Overview of Linux: What is Linux, Linux's Root in Unix, common Linux Features, advantages of Linux , Overview of UNIX and LINUX Architectures, Hardware requirements for Linux.
LINUX Internals: Introduction, process management, systems calls.

UNIT-II **[No. of Hrs.: 16]**

Linux File system: Logging in, getting familiar with Linux desktop, shell interface, understanding Linux shell, using shell, types of Text editors, using vi editor, prompt character, correcting typing errors, simple shell commands-date, cal, who, tty, uname, passwd, bc, script, echo, logging out, Environment variables, wild card characters *, ?
LINUX File System: boot block, super block, inode table, file types, absolute and relative path, listing files and directories commands, Navigating file system- pwd, cd, mkdir, rmdir, ls, pr
Handling ordinary files-cat, cp, mv, wc, rm, comm., amp, diff, Basic file attributes- file permissions, changing permissions

UNIT-III **[No. of Hrs.: 12]**

Processes and filters: Simple filters- head, tail, cut, paste, sort, uniq, tr, Regular expression-Grep utility, Shell command line, redirection, pipeline, split output, tee, Process- system processes, internal and external commands, background process, premature termination of process, process priorities, process scheduling-(at, batch), nohup command

UNIT-IV **[No. of Hrs.: 14]**

Shell programming: Interactive scripts, shell variables, assigning values to variables, positional parameters, command line arguments, arithmetic in shell script, exit status of a command, sleep and wait, script termination, Decision taking-if else, nested if, file tests, string tests, case control structure
Loop control structure-while, for, IFS, break, continue, \$* and \$@ ,logical operators && and ||
executing script, Debugging a script, executing multiple scripts

UNIT-V **[No. of Hrs.: 8]**

Communication and System Administration: Communication tools under Linux- write, msg, finger, talk, elm, pine, mailx
Connecting to remote machines-ftp, telnet, Adding and removing users, starting up and shutting down system, locating files- find, backups, copying tapes-dd, copy input output- cpio, tar, disk management-formatting, mounting, unmounting, using raw disk, monitoring system usage, ensuring system security.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. Neil Mathew, Richard Stones, "Beginning Linux Programming", Wrox Press.
2. Website: www.linux.org

REFERENCES:

1. Christopher Negus, "Fedora 6 and red hat enterprise Linux Bible" Wiley-India.
2. B. W. Kernighan & R. Pike, "The UNIX Programming Environment", PHI.
3. Cox K., "Red Hat Linux Administrator's Guide", PHI, 2001.
4. M. Beck, "LINUX Kernel Internals", Addison Wesley, 1997.
5. Yashwant Kanetkar, "Unix shell programming", BPB Publications.

PROPOSED COVERAGE:

- UNIT – I* [Chapter 2 Essential Reading (1), chapter 1, 2 Essential Reading (2)]
UNIT – II [Chapter 4,5,6,7 Essential Reading (1)]
UNIT – III [Chapter 14, 15, 10 Essential Reading (1)]
UNIT – IV [Chapter 16 Essential Reading (1)]
UNIT – V [Chapter 12, 17, 19.5, 19.6,27 Essential Reading (1)]

PAPER-VI: MANAGEMENT INFORMATION SYSTEMS
Paper Code: BCA 505

Credits: 04
Periods/week: 04
Max. Marks: 100

Objective: This module is aimed at teaching the methodology for building basics of Information System and its implementation at various levels of management.

UNIT – I **[No. of Hrs.: 12]**
Meaning and role of MIS: Introduction to MIS, definition & characteristics of MIS, Components of MIS, Nature & Scope of MIS, MIS organization within the company.
Management, organizational theory & systems Approach: Development of organization theory, management & organizational behaviour, management, information, and the systems approach.
Introduction to system and Basic System Concepts, Types of Systems Information System: Definition & Characteristics, Types of information, Role of Information in Decision-Making, Sub-Systems of an Information system : EDP and MIS Levels of Management TPS/MIS/DSS.

UNIT – II **[No. of Hrs.: 12]**
Information Systems for Decision making: Evolution of an Information System, Basic information systems, Decision making & MIS, Types of decisions--Structured Vs Un-structured decisions, Strategic , tactical & operational information for taking decisions, Simon's model of decision-making. MIS as a technique for making programmed decisions, decision assisting information systems.

UNIT – III **[No. of Hrs.: 12]**
Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details.
Conceptual Design – Definition of the problem, system objective and system constraints, analysis of information source, alternative system design and selection of optimal system, conceptual system designs document.

UNIT – IV **[No. of Hrs.: 11]**
Detailed System Design: Inform & Involvement of end user, aim of detailed design, project management, identification & trade-off criteria, defining subsystems, degree of automation of each operation, inputs, outputs & processing, early system testing, software, hardware & tools, documentation, Role of Top management during design.

UNIT – V **[No. of Hrs.: 13]**
Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train and operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.
System maintenance: Corrective, Adaptive & perfective maintenance.
Pitfalls in MIS: Fundamental weaknesses.
Functional MIS : A Study of Marketing, Personnel, Accounting MIS.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. R. G. Murdick, J. E. Ross and J. R. Clagget, “Information Systems for Modern Management”, 3rd Edition by, PHI – 1994

REFERENCES:

1. D. P. Goyal, “Management Information Systems”, Macmillan Business Books
2. Laudon & Laudon, “Information Systems”, PHI.

PROPOSED COVERAGE:

- UNIT-I [Chapter1 & 2 Essential Reading (1)]
- UNIT-II [Chapter 5 Essential Reading (1)]
- UNIT-III [Chapter 6 & 7 Essential Reading (1)]
- UNIT-IV [Chapter 8 Essential Reading (1) & ref (1)]
- UNIT-V [Chapter 9 & 10(10.1) Essential Reading (1), ref (1)]

PAPER-VII : LINUX LAB
Paper Code: BCA 506

Credits: 03

Periods/week: 06

M.M:100

Objective: This module is designed to introduce the students with the most powerful operating system and with its utilities i.e. Commands, Shell Programming, Administrative Concepts

Students are required to do the following exercises:

- 1) Working on directory structure
- 2) Practice for basic Linux commands
- 3) Shell programs based on basic commands
- 4) Practice for advanced Linux commands
- 5) Shell programs based on advanced commands
- 6) Server Settings, Installation and Configuration Management.

PAPER-VIII : RDBMS LAB

Paper Code: BCA 507 (A)

Credits: 03

Periods/Week: 06

Max. Marks: 100

OBJECTIVE: In this module students will design rich databases covering theory syllabi BCA 504A.

Following exercises should also be given to them:

Development of Data Base Applications (Application Domain):

Student database for school, Employee database for a company, Library Database for Library
Student database management system for school, Employee database management system for a
company, Library Database management system for Library, Railway Reservation System,
Hotel Reservation, Inventory Control System;

OR

PAPER-VIII : GEOGRAPHICAL INFORMATION SYSTEMS LAB
Paper Code: BCA 507 (B)

Credits: 03
Periods/Week: 06
Max. Marks: 100

OBJECTIVE:

In this module students will cover the practical aspects covering theory syllabi BCA 504B.

The students shall gain practical exposure in GIS related applications.

SEMESTER-VI

PAPER-I : ENTREPRENEURSHIP AND MANAGEMENT (FOUNDATION)

Paper Code: FEM 600

Credits: 02

Periods/week: 02

Max. Marks: 100

PAPER-II : COMPUTER GRAPHICS

Paper Code: BCA 601

Credits: 04
Periods/week: 04
Max. Marks: 100

Objective: This course is designed to learn how computer graphics are used in different application areas.

UNIT – I **[No. of Hrs. 12]**

Introduction to Computer Graphics: Definition, Application areas of Computer Graphics, Graphical user interface.

Overview of Graphics Systems: Video Display devices: Refresh Cathode Ray Tubes, Random scan displays, Raster scan displays, Color CRT monitors, Direct View Storage Tubes, Flat Panel displays, Raster Scan Systems, Random Scan Systems.

Input Devices: Keyboard, Mouse, Trackball and Spaceball, Joysticks, Data Glove, Digitizers, Image Scanner, Touch Panel, Light Pens.

UNIT – II **[No. of Hrs. 12]**

Graphics Software: Coordinate representations, Graphics Functions, Software Standards, and PHIGS Workstations.

Output Primitives: Points and Lines, DDA Algorithm, Bresenham's Line Algorithm, Circle Generating Algorithms: Properties of Circles, Midpoint Circle Algorithm.

Filled Area Primitives: Scan-Line Polygon Fill Algorithm, Inside –Outside Tests.

UNIT – III **[No. of Hrs. 13]**

Filled Area Primitives: Boundary Fill Algorithm, Flood Fill Algorithm, Antialiasing: Introduction.

Two Dimensional Geometric Transformations: Basic Transformations, Matrix Representations and Homogeneous Transformations, Composite Transformations: Translations, Rotations, Scaling, Other Transformations: Reflection, Shear.

Two-Dimensional Viewing: Viewing Pipeline, Viewing Coordinate reference Frame, Window-to-Viewport Coordinate Transformation,

UNIT – IV **[No. of Hrs: 11]**

Clipping Operations, Point Clipping, Line Clipping: Cohen-Sutherland Line Clipping, Liang-Barsky Line Clipping, Curve Clipping, Text Clipping.

Three-Dimensional Display Methods: Parallel Projection, Perspective Projection, Depth Cueing, Visible Line and surface, Identification, Surface Rendering, Exploded and Cutaway Views, Three-Dimensional and stereoscopic Views.

UNIT – V **[No. of Hrs: 12]**

Three-Dimensional Geometric and Modeling Transformations: Translation, Coordinate-Axes Rotation, Scaling, Other Transformation: Reflections, Shears, Composite Transformations,

Visible-Surface Detection Methods: Classification of Visible Surface, Back Face Detection, Depth Buffer Method, Depth Sorting Method, Area Subdivision Method.

BOOKS RECOMMENDED:

ESSENTIAL READING:

1. D. Hearn & M. P. Baker, "Computer Graphics", Prentice Hall of India, 2002.

REFERENCES:

1. Krisnamurthy N, "Introduction to Computer Graphics", Tata Mc Graw Hill Edition
2. Zhigang X. & Plastock R.A., "Theory and Problems of Computer Graphics", Schaum's Outline, Tata Mc Graw Hill Edition
3. Foley J.D & Dam A. Van, "Fundamentals of Interactive Computer Graphics", Addison-Wesley.
4. Ralf Skinmetz and Klana Naharstedt, "Multimedia: Computing, Communications and Applications", Pearson Education, 2001

PROPOSED COVERAGE:

- UNIT-I [Chapter 1, Chapter 2: 2.1, 2.2, 2.3, 2.5 Essential Reading (1)]
- UNIT-II [Chapter 2: 2.7, Chapter 3: 3.1, 3.2, 3.5, 3.11 Essential Reading (1)]
- UNIT-III [Chapter 3: 3.11, Chapter 4: 4.8, Chapter 5: 5.1, 5.2, 5.3, 5.4, Chapter 6: 6.1, 6.2, 6.3 Essential Reading (1)]
- UNIT-IV [Chapter 6: 6.5, 6.6, 6.7, 6.9, 6.10, Chapter 9: 9.1 Essential Reading (1)]
- UNIT-V [*Chapter 11: 11.1, 11.2, 11.3, 11.4, 11.5, Chapter 13: 13.1, 13.2, 13.3, 13.6, 13.8 Essential Reading (1)*]

PAPER-III : NETWORK SECURITY

Paper Code: BCA 602

Credits: 04

Periods /Week: 04

Max. Marks: 100

Objective: In this module, the students will gain conceptual/ theoretical knowledge of the various security- related issues and mechanisms to overcome them. The emphasis is given on basic concepts and direct application of mathematical expressions without analysis.

UNIT-I

[No. of Hrs.: 13]

Introduction: Attacks, Services and Mechanism, Model for Internetwork Security, Internet Standards and RFCs;

Cryptography Basics: Conventional Encryption Principles (Cryptography, Cryptanalysis) & Algorithms (Data Encryption Standard, Triple DEA, AES), Cipher Block Modes of Operation (Cipher Block Chaining & Cipher Feedback Mode), Location of Encryption Devices, Key Distribution.

UNIT-II

[No. of Hrs.: 14]

Public Key Cryptography & Message Authentication: Approaches, Secure Hash Functions; Public Key Cryptography Principles, Public Key Algorithms (RSA & Diffie –Hellman Key Exchange); Digital Signatures, Key Management.

Network Security Applications: Authentication Application: Kerberos, X.509 Authentication Service.

UNIT-III

[No. of Hrs.: 13]

Electronic Mail Security: Pretty Good Privacy Notation, Operational Description, Cryptographic keys & Key Rings, Public Key Management); S/MIME(MIME Extensions, Functionality, Certificate Processing, Enhanced security services).

Web Security: Web Security Threats, Web Traffic Security Approaches, Secure Socket Layer & Transport Layer Security (SSL Architecture, SSL Record Protocol, Change Cipher Spec Protocol, Alert Protocol, Handshake Protocol) and Secure Electronic Transactions (SET Overview, Dual Signature, Payment Processing).

UNIT-IV

[No. of Hrs: 10]

System Security: Intruders, Intrusion Techniques, Password Protection, Password Selection Strategies, Intrusion Detection; Viruses, Worms & Bacteria, Nature of Viruses, Types of Viruses, Macro Viruses, Antivirus Approaches.

UNIT-V

[No. of Hrs: 10]

Firewalls: Firewall Characteristics & Design Principles, Types of Firewalls: Packet Filtering Router, Application Level Gateway, Circuit Level Gateway, Bastion Host, Firewall configuration; Trusted Systems: Concepts, Data Access Control, Trojan Horse Defense.

BOOKS RECOMMENDED:

ESSENTIAL READINGS:

1. William Stallings, "Network Security Essentials: Applications and Standards", Prentice Hall of India.

REFERENCES:

1. William Stallings, "Network Security & Cryptology", Prentice Hall of India.
2. Pfleeger & Pfleeger, "Security in Computing", Pearson Education.
3. Gollmann, Dieter, "Computer Security", Edition 2, John Wiley & Sons.
4. Micki Krause, Harold F. Tipton, "Handbook of Information Security Management", Taylor & Francis Inc.
5. Debby Russell, T. Gangemi, Sr., "Computer Security Basics", O' Reilly Media Inc.

PROPOSED COVERAGE:

UNIT-I	[Chapter 1 – 2 Essential Reading (1)]
UNIT-II	[Chapter 3: 3.1-3.6., Chapter 4 Essential Reading (1)]
UNIT-III	[Chapter 5, Chapter 7 Essential Reading (1)]
UNIT-IV	[Chapter 9 Essential Reading (1)]
UNIT-V	[Chapter 10 Essential Reading (1)]

PAPER-IV: ARTIFICIAL INTELLIGENCE

Paper Code: BCA 603

Credit: 04

Periods/week: 04

Max. Marks: 100

Objective: This module will help the students to learn complex problem solving techniques.

UNIT-I

[No. of hrs.12]

Overview of Artificial Intelligence: What is AI, Importance of AI, AI and Related Field.
Knowledge: General Concepts: Introduction, Definition and Importance of Knowledge, Knowledge-Based Systems, and Representation of Knowledge, Knowledge Organization, Knowledge Manipulation, and Acquisition of Knowledge.

UNIT -II

[No. of hrs. 13]

Formalized Symbolic Logics: Introduction, Syntax and Semantics for Propositional Logic, Syntax and Semantics for FOPL, Properties of Wffs, Conversion of Clausal Form, Inference Rules, Resolution Principle, Nondeductive Inference Methods, And Representations Using Rules.

UNIT-III

[No. of hrs. 12]

Structured Knowledge: Graphs, Frames, And Related Structures: Introduction, Associative Networks, Frame Structures, Conceptual Dependencies and Scripts.

UNIT-IV

[No. of hrs. 12]

Search and Control Strategies: Introduction, Preliminary Concepts, Examples of Search Problems, Uniformed or Blind Search, Informed Search, Searching And-Or Graphs.

UNIT-V

[No. of hrs. 11]

General Concepts in Knowledge Acquisition: Introduction, Types of Learning, Difficulty in Knowledge Acquisition, General Learning Model, Performance Measures, Introduction to Expert system.

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. D.W. Patterson, "Introduction to AI and Expert Systems", PHI, 1992.

REFERENCES:

1. E. Rich and K. Knight, "Artificial Intelligence", Tata Mc Graw Hill, 2nd ed., 1992.
2. N.J. Nilsson, "Principles of AI", Narosa Publ. House, 1990.
3. Peter Jackson, "Introduction to Expert Systems", AWP, M.A., 1992.
4. R.J. Schalkoff, "Artificial Intelligence - an Engineering Approach", McGraw Hill Int.Ed., Singapore, 1992.
5. M. Sasikumar, S. Ramani, "Rule Based Expert Systems", Narosa Publishing House, 1994.

PROPOSED COVERAGE:

- UNIT-I [Chapter1: 1.1, 1.2, 1.4, Chapter2: 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, Essential Reading (1)]
- UNIT-II [Chapter 4: 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, Essential Reading (1)]
- UNIT-III [Chapter 7: 7.1, 7.2, 7.3, 7.4, Essential Reading (1)]
- UNIT-IV [Chapter 9: 9.1, 9.2, 9.3, 9.4, 9.5, 9.6, Essential Reading (1)]
- UNIT-V [Chapter 16: 16.1, 16.2, 16.3, 16.4, 16.5, Essential Reading (1)]

PAPER-V: COMPUTER GRAPHICS LAB
Paper Code: BCA 604

Credits: 02

Periods/Week: 04

Max. Marks: 100

Objective: This course is designed to implement the graphics using 'C' language based on theory paper BCA 602.

- *Introduction to basic graphics of 'C' Language*
- *Implementation of DDA Line Drawing Algorithm.*
- *Implementation of Bresenham's Line Algorithm.*
- *Implementation of Midpoint Circle Algorithm.*
- *Implementation of Boundary Fill Algorithm*
- *Implementation of Flood Fill Algorithm*
- *Implementation of Basic 2-D Transformation*

BOOKS RECOMMENDED

ESSENTIAL READINGS:

1. Hearn & Baker, "Computer Graphics", Prentice Hall of India.
2. Yashwant Kanetkar, "Let us 'C'", BPB Publication.

PAPER-VI : MAJOR PROJECT

Paper Code: BCA 605

Credits: 12

Periods/Week: 12

Max. Marks: 100

Objective: The student will be making a live project during sixth semester on any of the technologies. Evaluation shall be based on report, Viva and a demonstration or presentation held after sixth semester and will be conducted by the college committee. It must be software development project, incorporating all the steps of SDLC.
