BCA - 101

Communicative English

English Grammar: Use of Articles, Prepositions & Tenses.

Communication: Oral Communication, Conversions, Business Letter, Pronunciation & Transcription of Words.

Presentation Skills: Precise Writing, Essay Writing, Presentations skills related to Seminars & Conferences.

Suggested Books:

Wrien, P.C & Martin. H. "English Grammar & Composition". S. Chand.
T.Seth, Agrawal " The Art of English Grammer & Composition", Ratan Prakashan, Agra.
Sinha, K.K, Business Communication", Galgotia.
W.E. Allien, "Living English Structure"
"Business Communication", Irwin McGraw Hill.

BCA - 102

Mathematics

Integral Calculus: Integral as a inverse of differentiation. Integration by parts. Methods of substitution & use of partial fractions, standard forms and simple examples, definite integral & their applications to areas and length & Curves.

Real numbers and functions: Basic properties of R, Absolute value, Interval on the real line, Functions inverse functions. Graph of functions, Operations on functions. Composite of functions, Even and odd functions, monotone functions, periodic functions.

Limits And Continuity: Definition of Limit, Algebra of limits, Right & left hand limits, Infinite limits, Continuity (Definitions & examples, Algebra of Continuous functions), Differentiability, Rolle's . Mean value theorem with numerical problems.

Sequences: Definitions, Convergent Sequences, Catchy Sequences, Monotonic sequences, subsequences, Limit superior & limit inferior of a sequence.

Co-ordinate Geometry: System of lines, System of Circles, Standard equations & properties of parabola & ellipse.

Suggested readings:

Bansi lal & S. Arora"Two Dimensional Co-ordinate Geometry" S. chand
R.S Agarwal, "Differntial Calculus" S. Chand
S.C.Gupta 'Matrices", S. Chand

BCA – 103

Introduction to Computing

Introduction to computer and uses, Computer Generations and Classification (Micro, mini, mainframe, & Supercomputers).

Number System: Introduction, Decimal, Binary, Octal, Hexadecimal & their Conversions.

Binary Arithmetic: Binary Additions, Subtractions, Signed numbers, 2's compliment representation of numbers, fixed and floating point representation of numbers.

Basic Computer Organization: Input Unit, Output Unit, Storage Unit, Arithmetic and Logic unit, Control unit, Central processing unit.

Primary Storage: Storage locations and addresses, storage capacity, RAM, ROM, PROM, EPROM, Cache memory.

Secondary Storage Devices: Sequential & Direct Access devices, Punched paper devices Magnetic tape, Magnetic Disk, Floppy Disk, Winchester Disk, Magnetic Drum, Optical Disk, Magnetic Bubble Memory.

Input-Output Devices: Punched hole devices, Magnetic media devices, printers, Keyboard devices, Scanners, computer output microfilm, Digitizers, Plotters

CPU Organization: ALU, Control Unit, Accumulator and general and special purpose registers.

DOS: External and Internal Commands.

Windows O.S: Introduction & features.

Trends in Computing.

Suggested Readings:

Rajaraman, V." Funda\mentals of Computers" Prentice Hall of India, New Delhi.
Trainer, T"Computers" Mc Graw Hill, 1994

BCA - 104

Procedure Oriented Programming

Programming Fundamentals: Introduction to algorithms, Flow Charts. C character set, Identifiers and keywords, data types declarations, expressions, statement and symbolic constants, Input, output statements, getchar, putchar, scanf, printf, gets, puts functions.

Pre-processors command: #include, define.

Preparing and running a complete C program

Operators & Expressions: Arithmetic, unary, logical, bitwise, assignment & conditional operators, Library functions.

Control Statements: while, do -while, for statement, nested loops. IF-ELSE, switch. Break, continue & go to statement, comma operator.

Arrays: Single & multidimensional Arrays

Functions: Function prototypes, recursion, storage classes, automatic, external and static variables, passing value to a function

Suggested Reading:

Programming in ANSI 'C'	*E Balagurusami*	*TMH*
Computer Programming in 'C'	*V.Rajaraman*	*PHI*
Let Us 'C'	*Yashant Kanetkar*	*BPB*
Exploring 'C'	*Yashant Kanetkar*	*BPB*

BCA - 201

Advance Mathematics

Matrices: Definition, Types of matrices, Laws of operations on matrices, Transpose, adjoint and inverse of matrices, solution of linear system of equations, and cramer's rule, Rank of Matrices, square Matrices, Eigen values, Eigen Vectors, Characteristic polynomials, Cayley Hamilton theorem.

Differential Equation: First order and first degree differential equations, separation of variables, Homogeneous, linear, exact differential equations, second order linear equations with constant coefficients, Orthogonasl trajectories.

Vectors: Dot and cross product of two vectors, Gradeint, Curl and Divergent, Gauss's Theorem, Stokes theorem.

Determinants: Determinants and their properties.

Suggested Readings:

R.S. Agarwal	*Differential Calculus*	*S. Chand*
Harikrishna	*Real Analysis*	*S.Chand*
Sharma & Seth	*Vector Analysis*	*Ram Prasad & Sons*

BCA - 202

Discrete Mathematics

Introduction: Introduction to discrete structure & its significance for computer science, Counting, Permutation, Combination, pigeonhole, Recurrence Relation Set, Operation on sets, Cardinality, Product sets partition.

Function: Functions for computer science, permutation function, Boolean function, growth of functions.

Relations: Properties of relation, Equivalence relations, relations and Digraph. Transitive closure & Warshall algorithms

Logic: Statements, Negation operation, Logic connectives and compound statements, Conjunction, Disjunction, Truth tables, Duality, Conditional and Bi-conditional, Valid Arguments.

Game theory: Definition of Graph Theory, finite and Infinite graphs, Incidence 7 degree, null graphs, subgraphs, walks, path and circuit in a graph, trees properties of trees, cut sets and cut vertices, planner graphs, incidence matrix, directed graphs.

Introduction to Predicate Calculus: Predicates, the statement, the function variables & quantifiers, predicate formulas, free, & bond variables. The universe of discourse

Suggested Readings:

Elements of Discrete mathematics: C.L Lieu Mc Graw Hill
Discrete Mathematical Structure with Application to Computer Science: Trembly J.P Mc Graw Hill

BCA - 203

Introduction to Data Structure

Structured Programming, Top- Down/ Bottom up Design, ADT structures, Arrays(Single, Double, Triangular, Sparse), Row major column major order to store elements in double dim array, Address calculation of nth element in single dim array[ith, jth] element in double dim array, pointers(Introduction only), Structures(Definitions Application/ uses), memory management in 'C'{calloc(), malloc(), free()}.

Simple Graphics Program in 'C' (Line, circle, rectangle)

Data Structures (Definition, Application/ uses/ importance), classification of data structures in 'C' (inbuilt, user defined- linear and non linear), Stacks: common operations on stacks (Push, Pop, empty, full, display, count) Algorithms & simple program (Stacks operation) using Array.

Case studies on polish notation (Infix, Prefix, Postfix) manual operation only, searching (Linear, Binary) & sorting techniques (Bubble, selection, insertion). Recursion: Principles & application.

Suggested Readings:

Rajni Jindal	*Data structure using C*	*Umesh Publication*
HorowitzE	*Fundamental of data structure*	*Galgotia Publications*

BCA - 204

Business Data Processing

Data Processing: Concepts, Data processing Cycle, Methods of Data Processing, Major functional areas, Need of Data and Information.

Input and Output devices: An Overview.

Data storage Devices: tape Cartage, Circular Disk (Floppy), Hard Disk, And CD-ROM Disk.

Computing Environment: On-line processing, batch processing, Real time processing, Time Sharing, Multi- programming system, Distributed data processing, Buffering and Spooling.

File Operations: Sorting, Searching and Merging.

File Organization: Sequential, Direct or relative Access, Index Sequential File.

Data Storage Hierarchy: Fields, Records, Fixed & Variable length records, Primary & Secondary Key.

Programming Methodologies: Structured And Object oriented programming concepts. Programming principles, Coding Style, Testing and Documentation.

Suggested Readings:

V. K. Kapoor, "Introduction to Computer data processing" *S.Chand*
V. K. Kapoor "Fundamental of EDP" *S.Chand*
Govind, Raju "Programming Techniques for PC's" *BPB*

BCA - 205

Financial Accounting

Conceptual Framework: Meaning concepts, convention Scope, Importance of Accounting.

Recording: Account, Double entry system of book keeping, rules of book keeping, journals.

Classifying & Summarizing: Ledger posting & preparation of trial balance, managing & Importance of trial balance.

Analyzing: Manufacturing, trading, profit & loss account and preparation of balance sheet with adjustments.

Meaning concepts & scope of Ratio Analysis.

Familiarity with standard accounting package (Ex-Tally)

Suggested Readings:

Grewal. Ts. "Introduction to Accounting" S. Chand & Sons, New Delhi
Grewal, TS "Double Entry Book Keeping" S. Chand & Sons, New Delhi
Gupta RL & Radhaswamy "Advanced Accounting" S. Chand & Sons, New Delhi
Maheswari. SN "Principles of Management Accounting"

BCA - 301

Optimization Techniques

Introduction: Formulation and Graphical solution of L.P.P (two variables), limitations and advantages of L.P

Simplex Method: Slack and surplus variables, B.F.S from F.S Simplex method for L.P.P(Three variables).

Replacement Problem: Replacement of Items when time is continuous and discrete.

Queuing Theory: Queuing process, input process, servicing facility, distribution of arrivals 7 service time, M/MI, M/M/C.

Transportation and Assignment Problem: Mathematical formulation, North-Weat corner rule, Lowest cost entry method, Unit cost penalty method, Assignment problem.

Games Theory: Pay off matrix, Pure & mixed strategy, Saddle point, 2*2 game without saddle point, 2*n game, graphical method for 2*n & n*2 game.

Suggested Readings:

Tara, H.A	*Operation Research*	*McMillan*
Srinath, L.S	*Linear Programming*	*East west Pub*

BCA - 302

Management Information System

Introduction: Definition of MIS, Evolving concept of MIS and Academic Discipline, System of MIS.

Structure of MIS: Operating Elements, MIS Structure based on Management Activity and Organizational function.

Transaction Processing, Office Automation and Information Process: Transaction processing, Document preparation, Information processing, Information System Availability controls.

Decision making Process: Intelligence and designed phase, Concepts of Decision making, Behavioral Model and decision maker, Behavioral Modal of Organization decision making, Decision making under the Psychological Stress, Information System Design.

System Concept: Definition, General Modal of the System, type of the System, Subsystem system Entropy, System Stress and System Change, System Concept and organization, System Applied to MIS.

Organization Structure And Management Concept: Basic model of Organization Structure, Modifications of basic organizational Structure, Information processing Model of Organizational structure, Organizational culture and power, Organizational change, Management Theories, theory of MIS.

Decision Support System: Decision Support System, Expert System, Decision-making phases, Development of Decision making support system, planning support system.

Knowledge based system: Definition of knowledge work, type of knowledge work, Technology in knowledge work, Software support for knowledge work, End-User Computing.

Suggested readings:

Davis, Olgon	*Management Information System*	*TMH*
James A. O Brian	*Management Information System*	*TMH*
W. S. Jawadekar	*Management Information System*	*TMH*

BCA - 303

Digital Electronics

Number System: Number Basis, binary, Octal & Hexadecimal, Representation of numbers, conversions between basis, negative number representation, BCD numbers.

Truth table and Boolean Algebra: Truth tables, Evaluations of truth tables, Boolean variables, Boolean functions, Duality and fundamental theorems of Boolean algebra, Canonical & standard form.

Simplification of Boolean function: The Map method, 2,3 & 4 variables map, Product of sum implementation, Nand and Nor implantation, Don't care conditions

Combinational Logic: Introduction, Design procedures, Adders, Subtractors, code conversions, Parity bit, Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers, ROM, PLA.

Sequential Logic: Introduction, Flip-flop, Analysis of clocked Sequential Circuit(R-S, D,J-K, T Flip-Flop), Design of counters.

Suggested readings:

Mano. M: "Digital logic & computer Design", PHI
Malvino & Leach: "Digital principles and Application", TMH

BCA - 304

Database Management System

Overview of DBMS: Elements of database system, DBMS and it's architecture, advantages of DBMS, data independence, types of database users, role of database administrator.

Data models: Brief overview of hierarchal and network model, relation model (Relations, properties of relational model, keys and entity integrity & referential integrity rules), CODD's rules for referential Model.

Entity relationship Model: Entity sets, Relationship sets, Design Issue, Mapping constraints, E-R diagram, weak entity sets, specialization & generalization.

Normalization: Normalization concepts and update anomalies, Functional dependencies, Normal forms (1 NF, 2NF, 3NF, BCNF).

SQL: SQL constructs, SQL join, multiple Table queries, built in functions, views and their use.

Database Administrator: Centralized system, Client-Server systems,(Transaction server, Data server), Parallel system(Speedup & Scale up), Parallel database architecture(Shared memory, Shared Disk, Shared Nothing), Distributed System(Structures, Tradeoffs), Network Types(LAN, WAN)

Suggested Readings:

C.J.Date, An Introduction to Datbase System, Narosa Pub
Bipin Desai, An Introduction to Database System, Galgotia Pub
Silberschatz & Korth,, Database system Concepts, TMH

BCA - 305

System Analysis & Design

Introduction:
System:- System concepts, Characteristics, Elements, Types of System
System Development life Cycle: Recognition of need feasibility study, Analysis, Design, Implementation, Post- Implementation, Maintenance & prototyping
Role of System Analyst: definition, skills of system analyst, multifaceted role of the analyst.

System Analysis:
Information Gathering: definition, information gathering tools- review of literature, Procedures & Forms, interview, Question\s, Onsite observation.
Tools of Structured Design: Definition of Structured Analysis, Data Flow Diagram, Dat Dictionary, Decision Tree, Decision Table.
Feasibility Study: Definition, types of feasibility, steps in feasibility study.
Cost-Benefit Analysis: Data Analysis, Cost- Benefit categories, procedure for the cost/ benefit analysis.

System Design:
The process & stages of System Design: The process of design, design methodologies- structured design, form driven methodology, Structured walk through, Major development activities.
Input-Output & for Design: Input design, Output design, form design- Clkassification of forms, types of forms.

System Testing:
System Testing And Quality Assurance- Definition of System test plan, Activity network for system testing, prepare test plan, definition of quality assurance, goals in system life cycle, levels of quality assurance.

System Implementation:
Implementation & Software Maintenance- Definition of Implementation, Conversion, Activity Network for conversion, Post implementation review, definition of maintenance, Primary Activity of maintenance procedure.

Suggested readings:
Elias m. Awad: System Analysis and Design
Perry Edwards: System Analysis & design Mc Graw Hill

BCA - 401

Numerical & Statistical Technique

Introduction: Raw material of statistics, ungrouped & grouped frequency distribution, diagrammatic presentation: Bar diagram, Pie-diagram.

Graphical presentation: Histogram,Frequency polygon,frequency curve,cumulative frequency curve.

Measures of Central Tendency and Dispersion: Characterstics of a good average,Arithmetic mean,mode,median,Geometric mean,harmonic mean,Range,Mean daviation,Standard deviation,Skewness and Kurtosis

Correlation and Regression Analysis: Scatter diagram,Karlpearson,Spearman and Concurrent deviation methods,regression lines,Method of least square

Probabiltiy & Probablity Distribution: Classical,Empirical and axiomatic approach to probability,Addition and multiplicative law of probability,Binomial,poission & normal distribution

Numerical Methods:

Interpolation: Finite difference,Operators Δ,E,Newton Gregory Interpolation for equal intervals,divided difference,Newton's Lagrange's Interpolation for unequal intervals.

Central differences: Gauss forward,backward,third formula due to gauss,Strilling & bessel's formula

Numerical Differentiation & integration: Numerical differentiation by Newton Gregory formula,general quadrature formula,Trapezoidial rule,Simpson's 1/3 rule,simpson's 3/8 rule.Eular-Maclaurin's summation formula.

Suggested Readings:

Fundamental of mathematical statistics	*Gupta & Kapoor*	*S.Chand*
Introduction to Numerical Methods	*S.S.Shastri*	*PHI*
Computer based numerical methods	*V.Rajaraman*	*PHI*

BCA - 402

Operating System

Introduction: Definition, Simple batch system, Multiprogrammed batched system, Time sharing system; Process, File, System Call, The Shell.

Operating System Structure: Monolithic System, Layered system, Virtual Machines, Client Server Model.

Processes: Definition, Process Control Block, Long term & Short term scheduler, cooperating Process, Interposes Communication (Basic Structure, Direct Communication, Indirect communication, Buffering) Exception condition (Process termination, Last message, scrambled message), Process scheduling (Scheduling criteria, FCFS Scheduling, Shortest Job First, Priority scheduling, round robin scheduling.)

File System: File concept (Naming, structure, type Access, attributes, and operation), Directory structure (Single level, two levels, tree structured directories, Path names, and directory operations)

Memory Management: Swapping, Contiguous allocation, Single partition allocation multiple partition allocation, External & Internal fragmentation Paging (Basic Method), segmentation (Basic Method).

Deadlock: Introduction, Necessary condition, deadlock avoidance (safe and unsafe state), Deadlock prevention (Attaching the necessary conditions) Detection with one resource of each type, recovery through process termination & resource preemption.

Protection & Security: Goals of protection, Domain of protection (Domain Structure), Security problem, One time passwords, Program threats (Trojan Horse, trap Door), System threats (Worms, Viruses)

Suggested Readings:

Operating System Concepts	*S. Galvin*	*AWL*
Modern Operating System	*A.S. Tanenbaum*	*PHI*

BCA - 403

Computer System Architecture

Basic Computer Organization and Design: Instruction codes, computer registers, computer instructions, timing and control, Instruction cycle, Memory Reference Instructions (AND,ADD,LDA,STA,BUN,BSA,ISZ), Microinstruction format, Symbolic microinstruction, Micro program sequencer, Hardwired control vs Micro programmed control.

Central Processing Unit: General register organization, Control word, register stack, memory stack, Instruction format(zero address, one address, two address, three address instructions), Addressing modes, RISC vs. CISC.

Pipelining: Parallel processing, Flynn's classification, space time diagram, speedup ration, Arithmetic pipeline, Instruction pipeline (four segment instruction pipeline), and pipeline conflicts.

Input-Output Organization: input output interface, I/O command, strobe control, handshaking, baud rate, Modes of transfer, (programmed I/O, Interrupt initiated I/O, DMA), priority interrupt (software and hardware), priority encoder, DMA controller.

Memory Organization: Memory hierarchy, RAM, ROM, Magnetic disk, Magnetic tapes, Associative Memory, Cache memory, Virtual Memory, Memory Management hardware.

Reference Books:

1. *Computer System Architecture- M.Moris Mano (PHI publication)*
2. *Computer Organisation and architecture- Pal Chaudhary*
3. *Structured computer organization- Tanenbaum*

BCA - 404

Object Oriented Programming

Object oriented programming:
Procedural vs. Object oriented programming, The main function, C++ preprocessors and the <iostream.h> file, C++ input and output with cin and cout,

C++ data types:
Simple variables, naming simple variables, Integer types, Floating types, Operators, Operator precedence and associativity, Type conversion, symbolic constants, Derived data types, Arrays, strings, structure, reference variables, new and delete operators.

Loops and branching statements:
Relational expression in C++, relational operators, for loop, while loop, do-while loop, if-else statement, logical operators, conditional operators, switch statements, break and continue statements.

Functions:
Defining a function, function prototyping and function calls, function arguments, passing by reference, inline functions, and default arguments.

Objects and classes:
Defining classes, implementing member functions, class constructor and destructor, this pointer, friend function, examples based on class and object problems.

Class inheritance:
Base classes, derived classes, implementing and using derived classes, virtual base class, types of inheritance. Problem based on multiple inheritance

Input-output and files:
Stream classes, output with iostream class methods, input with cin, introduction with file handling.

Suggested readings:

1. ***E.Balagurusamy****: Object oriented programming with C++*
2. ***K.R.Venugopal****: Mastering C++*
3. ***Bjarne Stroustrup****: The C++ programming language.*

BCA - 405

Computer Graphics

Introduction of Computer Graphics :
Brief discussion about Display devices, CRT and its working Flat Panel, LCD etc and Working.

Introduction of Point Plotting Technique & Coordinate System :
DDA Line Drawing Algorithm, Bresenham's line drawing algorithm.

Inremental Method Circle Generation Algorithm :
DDA Method Midpoint Circle Generation Algorithm, Bresenham's Algorithm for Circle Generation, Display and Controllers.

Introduction of Transformation and Transformation Principles :
Scaling and Rotation, Composite transformation, Instant transformation and concatenation of matrices, Homogeneous coordinate and matrices.

Intro of Clipping and Windowing and Viewing Transformation :
Viewing coordinate references frame and window–to-viewport, mapping, Point clipping and Line clipping, Polygon clipping, Midpoint subdivision algorithm, Positioning Technique, Positioning constraint, Pointing and selection Inking, Painting and constraint, Online character recognition.

Introduction of Event Handling :
Polling, Interrupts and Event queue, Function for event handling, Light pen interrupt, Selection interrupt, Representation of Raster Image & Frame buffer display, Intro Natural Image, Sampling, Continue the same and Halftoning, Geometric representation of area scan converting polygon, X-Y algorithm and its properties, Raster manipulation functions.

Text book /References :
Computer Graphics , Hearn & Baker, PHI

BCA - 501

Software Engineering

SDLC Models, Exploratory Style & Modern Approaches of Programming.

Requirement Analysis :
Statement of System Scope, Communication Technique, Analysis Principles, Software Prototype & Specification, Algebraic Specification.

Analysis Modeling :
Data Modeling, Functional Modeling, Behavioral Modeling, Mechanics of Structured Analysis, Data dictionary.

Design Concept :
Design Process, Principles Concepts.

Design Method :
Architectural Design & Process, Procedural Design, Interface Design.

Software Testing Methods :
Test Cases, white box testing, basis path testing, black box testing, testing for specialized environment.

Software Implementation :
Structured coding techniques, coding style, Standard and guidelines, documentation guidelines.

Software Maintenance :
Maintainability during development, managerial aspects of Software Maintenance, Maintenance tools and techniques.

References :
Software Engineering, A Practioner's Approach, Roger S. Pressman, Mc Graw Hill Publication.
Software Engineering Concepts, R.E. Fairely, Tata Mc Graw Hill Publication.
An Integrated Approach of Software Engineering, P.Jalote, Narosa Publication House.

BCA - 502

Internet Techniques & Applications

Description of Internet: Definition, role of Internet (Social point of view, technical point of view, practical/commercial point of view, Internet history/ development, working, domain name, Address concept), How to connect with net(Hardware, software, communication requirements), Internet Accounts, ISP, Role of ISP, International & National ISP's (like AOL, MSN, CompuServe, VSNL, BSNL, Satyam etc.), Types of accounts. World wide web (WWW), Application areas of Internet.

Surfing the Net: Surfing, Concept of the web Browser(Internet Explorer, Netscape Navigator etc.), URL,HTTP, Browsing, Web page Home page, Hyperlink, Searching on the Web, Searh Engines(yahoo, Hotmail,VSNL, Khoj, Rediff), Chatting.

Electronic mail: Basic about E-mail, How it works, Advantages and limitations of E-mail, E-mail Account, Mail account, Mail box, Getting, composing, Sending, Editing E-mails, Address, Books, Attaching files with E-mail.

Other Communication Tools on Internet: ftp, ftp sites, common ftp commands, TELNET, common TELNET commands, Newsgroups, news bulletins boards.

E-Commerce on the Internet: Definition, History of E- Commerce, types of E-Commerce(B2B,B2C,C2B etc), Electronic payment system(wallet, e-cash, e-cheque, Digital Signature), Application Areas of E-Commerce, Legal Vs Security Issues.

Internet Application Development: Fundamental Programming in Java, HTML, DHTML, Front page & Other web Design tools, Creation of home Page/web page.

Suggested Readings:

Learning to use the internet	*Ernest Ackermann*	*BPB*
ABC to the Internet	*Christian Crumilsh*	*BPB*
Electronic Commerce	*Ravi Kalalota, Andrew B*	*Addison- Wesley*

BCA - 503

Visual Language Programming

Introduction: Introduction to Visual Language, features of Visual Language, Environment and application areas of Visual languages, Introduction to project, Forms, Objects, Properties, Method, Events, Overview to the main Screen, Title bar, Tool Box, Customize the form, use of visual objects on the form(Command button, Check Boxes, Option Button, Text boxes etc.)

Program Elements: Data types, Variables, Constants, Statements, Writing Codes behind visual objects, use of procedures and function (In-built/user defined), Decision making, looping, branching, switching, arrays, modules.

Visual programming: Creating forms, Add objects to the form, writing codes behind the objects, compile & run the program, convert to the exe form, use of Menu bars with form, developing MDI forms in the project.

Database programming: use of data source object to link form with tables, Attach database objects with table, perform append, deletion, editing, searching, quering operation on database, use of SQL.

Simple program in Visual Language with anyone VC++ or VB

Suggested readings:

VC- The complete Reference, Cris H. Pappas

BCA - 504

Digital Communication Networks

Introduction : Networking, Use of Computer Networks(Goals and Applications), OSI Reference Model & TCP-IP Refernce Model, Novel Netware, ARPANET, NSFNET, The Internet.

Network: OSI reference Model, Topology types, Selection design, local area network, Wide area Network, CSMA/CD, token bus, token ring techniques, protocols, medium Access control (MAC) protocol, Physical layer Description (X.21), Data link Layer protocols, HDLC, Analysis of protocols, Introduction to Network layer, Network Security, Electronic Mail, Switching Techniques, Routing methods, TCP-IP, ISDN

Communication: Introduction, Concept of data Transmission, Signal Encoding, Modulation methods, Multiplexing, Cryptography.

Suggested Reading:

Tannenbaum, A.S, Computer Networks, Prentice Hall.
Stallings, William: Data & Computer Communication, PHI
Comer: Internetworking with TCP/IP: Volume I, PHI.

BCA - 505

Java Programming

Unit 1: Introduction to Java
Procedure Vs Object oriented Programming with reference to OOPS principles, History of Java, Java features, JDK, JVM, Hello world program in Java, Compilation Using Java and execution using Java.

Unit 2: Data types, Tokens in java
Tokens of Java, Data types in Java with size and range, simple, floating, Boolean etc. Type conversions, Type casting, declaring variables, Arrays in Java
Simple programs in Java base on variables and constants.

Unit 3: Java Operators
Arithmetic Operators, Relational, Logical, Bitwise, **B**oolean operators and their use in Java programs.

Unit 4: Control Statement in Java
Loops(for, while, do- while), Decision making statement(If- then- end if), nested If, Nested Loops, Switch- case and sample programs
.

Unit 5: Object Oriented Programming In Java
Concept of Class and objects in java, Java Class creation, scope Identifiers, java methods, object and use of methods by objects, sample class based programs in java, method overloading in Java, Abstract class and it's use, java Constuctors.

Unit 6: Inheritance & Multithreading in Java
Define Inheritance, Types of inheritance in Java and use in Programs, Super class, Method overriding, Java Thread model, native methods of threads class.Implementation of threads in java, Simple Applet programming in Java.

Suggested Reading:
Java 2.0 *E.Balaguruswami*
Java 2.0 Complete Reference *Peter Norton*
Java Black Book

BCA - 601
Multimedia & Application

Multimedia: An Introduction, Definition, Facets of multimedia, Various classification.
Multimedia: Hardware/ Software Requirements, Introduction, A typical multimedia system configuration, multimedia upgrade standards. Multimedia Hardware.

Multimedia Software: Introduction, Various types of multimedia software, Drivers, Players, tools and application.

Multimedia Audio: Digital Audio Technology- Computer And Sounds, Digital Audio, Definition, Digital Audio Parameters, Audio Channel sing, Digital Recording pitfalls, digital Audio playback.

The Sound Card Fundamentals: The Audio Card Family: Sound Cards, MIDI, Interface Cards and wave synthesis cards, the sound card fundamentals: Audio Synthesis technology- FM synthesis and Wavetable Synthesis, Sound Card Functionalities, Configuration the Sound Card under MS- windows 95 and Windows 3.11.

Digital Audio Playback and Recording- Digital Audio Playback: Windows Media player Program, Creative's Group of Audio Software, Multimedia Deck, Player and Editing Programs, Digital Audio Recording and Editing Techniques, Creative's Wave Studio Software.

MIDI Fundamentals: Introduction, Concept of MIDI, MIDI vs Digital Audio, General MIDI standards: Base level and extended level MIDI, General MIDI channel Assignments, General MIDI Instruments Assignments, Creative's Wave Blaster Cards.
Working with MIDI: MIDI Playback, MIDI Recording the MIDI Music data, Editing MIDI Music files: Music, Sculptor.

MULTIMEDIA TEXTS:
Texts in Multimedia: introduction, Text as a part of multimedia project, Designing texts for multimedia, multimedia text- Display design consideration- (a) Fonts and their management, (b) Titling: Anti- aliasing texts and special effects, Multimedia text- Content design considerations, hypermedia, Hypertexts, Text Editing Software Tools.
Multimedia Graphics:
The world of colors- Introduction, basic Concepts of Color Displays, monitor video Modes, Color Monitors, Color monitors Parameters, Switching on to the difference video mode, The public Information display System (PIDS), Presentation Display System (PDS).
Digital Imaging Fundamentals: Introduction, Graphics in multimedia project- Interface Design Graphics and content Design, Sources of Images: Photographic Images, Clip arts and others, 3 dimensional graphic images, Rastor and Vector Graphics, Hypergraphics, Digital Imaging Software tools.

BCA - 601 Contd.

Digital Image Development and Editing- Scanning Techniques, Digital Photographic techniques, Graphic Editing/ Manipulation terminology, Anti-Aliasing Picture, Image processing Software tools, Photo gallery, CD- ROMs, Clip Arty Libraries and other sources of Images.

MULTIMEDIA ANIMATION:
Computer Animation Fundamental- Introduction, Animation in multimedia projects, Object and cel animation, two dimensional And Three dimensional Animations.

Animation Software tools and Techniques- introduction, decision between two and three dimensional Animation. Two and three dimensional Animation techniques, Preliminary procedures. Animation development process, two dimensional animation Environment. Three dimensional animation Environment, two dimensional animation software tools, Kinetics animation Studio, three dimensional animation software tool, kinetics

MULTIMEDIA VIDEO:
Digital video Fundamentals- introduction, video in multimedia projects, digital video fundamentals, full motion and full screen videos, digital video file sizes, MPEG revolution, Apple's Quick time video for Windows.

Digital Video Production Techniques- Introduction, video production in multimedia, shooting the sequence, video capture techniques, video capture boards, the connection jacks, setting up the digital video studio, video capture software, editing out the video stuff, cut, copy and paste operations, zooming, digital painting process, chroma keying, Embedding sound clipses.

Suggested readings:
"Multimedia Magic" by S. Gokul;, BPB Pub.
"An Introduction of Multimedia": By John Villamil & Louis Molina, PHI Pub.

BCA VI Sem

Artificial Intelligence(602)

Overview of AI: Early Works in AI, AI and related fields, Early Works in AI, AI and related fields

Problem Solving: Problem Solving introduction, State space search**,** Production system: BFS, DFS, Problem characteristics, Heuristic search-Generate and Test, Simple Hill Climbing

Knowledge Representation: Intro. Of Knowledge representation, Definition and Importance of knowledge, Knowledge based system, Representation of Knowledge, Introduction of Predicate logic, Well Formed Formula, Inference rule and numerical, The Resolution principle, Representation using rule

Object Oriented Representation: Concept of Object Oriented Programming: Overview, Programming approach: Object, class, Message and Method, Intro. Of Simulation and example of Simulation, Uses of AI in OOPs

Learning: Intro of Learning, Basic concept, Genetic Algorithm, Learning by Induction

Expert System: Intro, Need and justification of Expert system, Knowledge Acquisition, Knowledge building tools

Suggested reading:

Dan W. Petterson: Introduction to AI and expert system, PHI

BCA - 603

Networking Operating System

Introduction: Background, UNIX philosophy, online help facility, man command.

The File System: The file structure of file system, interacting with file system, pwd, cd, ls, cat, mkdir, rmdir commands, relative path names, chmod, cp, rm, and mv commands, special device files.

General Purpose Utilities: More, file, wc, cmp, comm., diff, lp, banner, cal, date, who, tty and commands

The Vi Editors: Three Modes, input mode, adding and replacing text, saving text and quitting, repeat factor, command mode, operators, handling multiples files, customizing vi.

Filters: Three standard files connecting command with a pipe, tee, pr, head, tail, cut, paste, sort, filters grep, egrep, fgrep filters.

Shell Programming: The Shell and Kernal, Bourne, C and Kron shells, sh command, combining commands, wild cards, escaping, quoting, command substitution, shell variables, system variables, positional parameters, logical operators, if condition, read, exit, case, while, until, set, shift and trap statements. looping with for. Simple shell programs.

Win NT: Introduction to Windows NT.

Suggested Reading:

1. *Stephen Prata (SAMS Pub)-Advanced UNIX Programming.*
2. *Kernighan and Pike- The UNIX Programming Environments*
3. *Lowell Jay Arthur and Ted Burns-UNIX Shell Programming.*
4. *Yashwant P.Kanetker-UNIX Shell Progamming.*
5. *Sportack,M Windows NT. Techmedia*