BCA Syllabus

Semester I

- BCA101 Communicative English
- BCA102 Basic Mathematics
- BCA103 Introduction to Computers
- BCA104 Procedure Oriented Programming
- BCA105 Financial Accounting
- BCA106 Lab C Programming

Semester II

- BCA201 Discrete Mathematics
- BCA202 Database Management Systems
- BCA203 Data Structures
- BCA204 Digital Electronics
- BCA205 Operating System
- BCA206 Lab Data Structures/DBMS

Semester III

- BCA301 Organizational Behaviour
- BCA302 Optimization Techniques
- BCA303 Computer Graphics
- BCA304 Computer System Architecture
- BCA305 Object Oriented Programming with C++
- BCA306 Lab Computer Graphics in C++/ Optimization Techniques

Semester IV

- BCA401 Digital Communication and Networks
- BCA402 Numerical Analysis and Statistical Techniques
- BCA403 Unix and Shell Programming
- BCA404 Environmental Science
- BCA405 Java Programming
- BCA406 Lab Java Programming/Unix Programming

Semester V

- BCA501 Software Engineering
- BCA502 Artificial Intelligence
- BCA503 (a)Python
  (b)C# with .NET Frame work
- BCA504 Theory of Computation
- BCA505 Web Technology
- BCA506 Lab Python/ C#

Semester VI

- BCA601 Project Work

Marks Distribution

	Internal	External	Total
Theory Paper	**30**	**70**	**100**
Practical Exam	**30**	**70**	**100**
Major Project	**300**	**300**	**600**

BCA 101 Communicative English

Unit I Communication:

Meaning of communication, Importance of communication, Communication scope, Process of communication, Communication models and theories, Essentials of good communication, The seven Cs of communication, Factors responsible for growing importance of Communication, Channels of communication, Verbal and Non-Verbal communication, Formal and Informal communication, Barriers of communication

Unit II Written Communication:

Objectives of written Communication, Media of written communication, Merits and demerits of written communication, Planning business messages.
Writing Letters: Business letters, Office memorandum, Good news and bad news letters, Persuasive letters, Sales letters, Letter styles/ layout.
Language Skills: Improving command in English, Choice of words, Common problems with verbs, adjectives, adverbs, pronouns, conjunctions, punctuation, prefix, suffix etc.

Unit III Oral Communication:

Principles of effective oral communication, Media of oral communication, Advantages of oral communication, Disadvantages of oral communication, Styles of oral communication.
Interviews: Meaning & Purpose, Art of interviewing, Types of interview, Interview styles, Essential Features, Structure, Guidelines for Interviewer, Guide lines for interviewee.
Meetings: Definition, Kind of meetings, Advantages and disadvantages of meetings/ committees, Planning and organization of meetings.

Unit IV Job Application:

Types of application, Form & Content of an application, drafting the application, Preparation of resume. Project Presentations Advantages & Disadvantages, Executive Summary, Charts, Distribution of time (presentation, questions & answers, summing up), Visual presentation, Guidelines for using visual aids, Electronic media (power-point presentation).

Unit V Arts of Listening :
Good listening for improved communications, Art of listening, Meaning, nature and importance of listening, Principles of good listening, Barriers in listening, Business Negotiation: Definition of negotiation, Factors that can influence negotiation.

BCA102 Basic Mathematics

Unit I 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.

Unit II 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.

Unit III Co-ordinate Geometry:

System of lines, System of Circles, Standard equations & properties of parabola & ellipse.

Unit IV 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.

Unit V Differential Equation:

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

Suggested readings:

Bansi lal & S. Arora "Two Dimensional Co-ordinate Geometry" S. chand

S.C.Gupta	'Matrices",	S. Chand
R.S. Agarwal	Differential Calculus	S. Chand
Harikrishna	Real Analysis	S.Chand

BCA103 Introduction to Computers

Unit I Introduction to computer: Brief history of development of computers, computer system concept, characteristics, capabilities and limitations, types of computers ,Bios, software, Hardware, firmware, Booting files & Directory system. Data, information and their need, Levels of information, Quality of information, Comparison of manual & electronic storage of data, Organization of data as file, Use of information in data processing systems, Various data processing methods.

Unit II Software: What is Software?, Need, types of Software (System Software, Application Software), Program concept, Characteristics of programming, Various stages in

program development. Generation/types of computer languages (Machine, Assembly, high level,4 GL) and their Merits & demerits. Comparative study, assembler, compiler, Interpreter, Examples & areas of use of various high level language & their features, procedure & object oriented language, applications programming generators.

Unit III Number System: Introduction, Decimal, Binary, Octal, Hexadecimal & their Conversions. Binary Additions, Subtractions, Signed numbers, 2's compliment representation of numbers,Fixed and floating point representation of numbers.

Unit IV Storage Devices: Primary Storage: Storage locations and addresses, storage capacity,RAM,ROM, PROM, EPROM, Cache memory.**Secondary Storage** : Sequential & Direct Access devices, Punched paper devices Magnetic tape, Magnetic Disk, Floppy Disk, Winchester Disk, Magnetic Drum, Optical Disk, Magnetic Bubble Memory.

Unit V Input-Output Devices: Input devices : Keyboard, Pointing Devices: Mouse Trackball, Touch pad,Trackpoint, Joystick, Touch Screen,Graphics tablet, Scanner, Barcode Reader, Microphone, Optical Mark Reader, Magnetic strip Reader, MIDI devices, Finger printer reader, Digital Camera

Suggested Readings:

1. FUNDAMENTALS OF COMPUTERS -by V. RAJARAMAN.
2. FUNDAMENTALS OF COMPUTERS -by P.K.SINHA
3. FUNDAMENTALS OF COMPUTER Systems. Low Price Edition.

BCA 104 Procedure Oriented Programming

Unit I About C:

Evolution of C, Programming languages, Structure of a C program, Compiling a C program, Character set in C, Keywords in C, Hierarchy of operators, Basic data types, Qualifiers used with basic data types, Variables in C, Type declaration, Output function, Input function and format specifiers, arithmetic operators, Unary operators, Relational and logical operators.

Unit II Control statements:

if statement, if else statement, for statement, while loop, do while statements, break statements, continue statements, switch statement, goto statement, ternary operators.

Unit III Arrays:

advantages of arrays, types of arrays, array declaration, array initialization, accessing data from array, array inside the memory, multidimensional arrays. Character arrays, Array overflow, String Variables, Reading & writing strings, string handling functions.

Unit IV Functions:

advantages of functions, declaring a function, calling a function, variables, passing arguments to a function, nested functions, passing array to functions, recursion in functions, Call by value and Call by reference. Pointers and function, Array of pointers, Pointer and Strings, Pointer to structure, Pointers within structure, Introduction of Static and Dynamic memory allocation, Dynamic memory allocation, DMA functions , malloc ( ) function, Size of( ) operator, Function free( ), Function realloc ( ).

Unit V File handling:

Introduction, File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character, Using fopen( ), getc( ), putc( ), and fclose( ), Using feof( ).

BCA105 Financial Accounting

Unit I

Overview - Meaning and Nature of Financial Accounting, Scope of Financial Accounting, Financial Accounting & Management Accounting, Accounting concepts & convention, Accounting standards in India.

Unit II

Basics of accounting – Capital & Revenue items, Application of Computer in Accounting Double Entry System, Introduction to Journal, Ledger and Procedure for Recording and Posting, Introduction to Trail Balance, Preparation of Final Account, Profit & Loss Account and related concepts, Balance Sheet and related concept.

Unit III

Financial statement analysis: Ratio analysis, Funds flow analysis, concepts, uses, Preparation of funds flow statement, simple problem, Cash flow analysis, Concepts, uses, preparation of cash flow statement, simple problem, Break – even analysis. Definition nature and Objective of Financial Management, Long Term Sources of Finance, Introductory idea about capitalization, Capital Structure, Concept of Cost of Capital, introduction, importance, explicit & implicit cost, Measurement of cost of capital, cost of debt.

Unit IV

Concept & Components of working Capital. Factors Influencing the Composition of working Capital, Objectives of working Capital Management – Liquidity Vs. Profitability and working capital policies. Theory of working capital: Nature and concepts. Cash Management, Inventory Management and Receivables Management.

Unit V

Introduction to computerized Accounting System : coding logic and codes required ,master files, transaction files ,introduction to documents for used data collection ,processing of different files and output obtained

Text Books:

1. Maheshwari & Maheshwari, "An Introduction to Accountancy", 8th Edition, Vikas Publishing House, 2003
2. Gupta R.L., Gupta V.K., "Principles & Practice of Accountancy", Sultan Chand & Sons, 1999.

3. Khan & Jain, "Financial Accounting"

BCA201- Discrete Mathematics

Unit I Propositional Logic :

Propositions – Logical connectives – Compound propositions –Conditional and biconditional propositions – Truth tables – Tautologies and contradictions – Contrapositive – Logical equivalences and implications – DeMorgan's Laws - Normal forms – Principal conjunctive and disjunctive normal forms – Rules of inference – Arguments - Validity of arguments.

Unit II Predicate Calculus:

Predicates – Statement function – Variables – Free and bound variables – Quantifiers – Universe of discourse – Logical equivalences and implications for quantified statements – Theory of inference – The rules of universal specification and generalization – Validity of arguments.

Unit III Set Theory: Basic concepts – Notations – Subset – Algebra of sets – The power set – Ordered pairs and Cartesian product – Relations on sets –Types of relations and their properties – Relational matrix and the graph of a relation – Partitions – Equivalence relations – Partial ordering – Poset – Hasse diagram – Lattices and their properties – Sublattices – Boolean algebra – Homomorphism.

Unit IV Functions: Definitions of functions – Classification of functions –Type of functions - Examples – Composition of functions – Inverse functions – Binary and n-ary operations – Characteristic function of a set – Hashing functions – Recursive functions – Permutation functions.

Unit V Groups: Algebraic systems – Definitions – Examples – Properties – Semigroups – Monoids – Homomorphism – Sub semigroups and Submonoids - Cosets and Lagrange's theorem – Normal subgroups – Normal algebraic system with two binary operations - Codes and group codes – Basic notions of error correction - Error recovery in group codes.

TEXT BOOKS:

1.Trembly J.P and Manohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw–Hill Pub. Co. Ltd,
2. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition,Pearson Education Asia,

BCA 202 Database Management Systems

Unit I 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.

Unit II Data models:

Brief overview of hierarchical 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.

Unit III Normalization:

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

Unit IV Operations:

SQL fundamentals - Integrity – Triggers - Security – Advanced SQL features –Embedded SQL– Dynamic SQL- Missing Information– Views – Introduction to Distributed Databases and Client/Server Databases

Unit V Database Administrator:

Centralised 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), Backup and Recovery, Security and Privacy

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 203 Data Structures

Unit I Basic concepts-Data types, Abstact Data Types,Data structures,Algorithms, Performance analysis- time complexity and space complexity,Asymptotic Analysis-Big O,Omega and Theta notations. Linear data structures- Linear Lists,Sequential and Linked allocation ,The list ADT, array and linked Implementations,Singly Linked Lists-Operations Insertion,Deletion,

Unit II Non Linear data structures- Trees – Basic Terminology, Binary tree ADT,array and linked representations, traversals, threaded binary trees, Disjoint Sets, Union and Find algorithms, Priority Queues-Definition, ADT, Realizing a Priority Queue using Heap. Graphs – Introduction, Basic Terminology, Graph Representations- Adjacency matrix, Adjacency lists, Adjacency multilists, Graph traversals- DFS and BFS

Unit III Searching- Linear Search ,Binary Search, Hashing-Introduction, hash tables, hash functions, collision resolution methods, Comparison of Searching methods. Sorting- Bubble Sort, Insertion Sort, Selection Sort, Heap Sort.

Unit IV Search Trees-Binary Search Trees, Definition, ADT, Implementation, Operations-Searching, Insertion and Deletion, AVL Trees, Definition, Operations – Insertion and Searching,

Unit V Algorithm Design methods-Greedy method-applications- Kruskal's Algorithm for Minimum cost Spanning trees, Job Sequencing with dead lines, Single Source Shortest path problem.

TEXT BOOKS :

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss,3rd edition, Pearson Education. Ltd.,

2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition,seventh edition, John Wiley and Sons.

3. Data structures , Algorithms and Applications in C++,S.Sahani, Universities Press.

BCA 204 Digital Electronics

Unit I : Fundamental concepts
Introduction ,Digital Signals ,Basic Gates and derived Gates (AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR),Boolean Algebra, Simplefication of Boolean Function.

Unit II : Combinational Logic Design: Half adder, full adder. ,r's and r-1's compliment, BCD Code, Excess-3 Code, Gray Code ,Error detecting and correcting codes. Standard

Representation of logical functions SOP, POS Forms, K-map Representation of logical functions, Simplification of logical functions using K-map ,Multiplexer, Demultiplexer ,Encoder, Decoder

Unit III : Sequential Logic Design : Flip Flops, S-R Flip Flop .J-K Flip Flop .Master Slave Flip Flop . D-type Flip Flop,T-type Flip Flop, Registers, Shift Register ,

Unit IV: Counter : Synchronous and asynchronous Counter, ripple counter, the memory unit, triggring flip flop, analysis of clocked sequential circuit, state reduction and assignment.

Unit IV Timing Circuits and Converters :
Control logic design: control organization, hardwired control, microprogram control, control of processing unit.

Suggested Readings:

1. "Modern Digital Electronics": -by R.P. Jain
2. Degital logic and Computer design By Morris Mano

BCA 205 Operating System

Unit I Operating System Introduction:
Operating Systems objectives and functions, Computer System Architecture, OS Structure, OS Operations, Evolution of Operating Systems - Simple Batch, Multi programmed, time-shared, Personal Computer, Parallel, Distributed Systems, Real-Time Systems, Operating System services,

Unit II Process and CPU Scheduling:
Process concepts-The Process, Process State, Process Control Block, Threads, Process Scheduling-Scheduling Queues, Schedulers, Context Switch, Preemptive Scheduling, Dispatcher, Scheduling Criteria, Scheduling algorithms, Multiple-Processor Scheduling, Real-Time Scheduling,

Unit III Memory Management and Virtual Memory:
Logical & Physical Address Space, Swapping, Contiguous Allocation, Paging, Structure of Page Table, Segmentation, Segmentation with Paging, Virtual Memory, Demand Paging, Performance of Demanding Paging, Page Replacement Page Replacement Algorithms, Allocation of Frames, Thrashing, Case Studies: Linux, Windows.

Unit IV File System Interface:
The Concept of a File, Access methods, Directory Structure, File System Mounting, File Sharing, Protection, File System Implementation - File System Structure, File System Implementation, Allocation methods, Free-space Management, Directory Implementation, Efficiency and Performance, Case Studies: Linux, Windows. Mass Storage Structure

Unit V Deadlocks:
System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock. Protection – System Protection, Goals of Protection, Principles of Protection, Domain of

Protection, Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection, Case Studies: Linux, Windows.

TEXT BOOKS:

1. Operating System Principles , Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th Edition, Wiley Student Edition
2. Operating Systems – Internals and Design Principles, W. Stallings, 6th Edition, Pearson Education.

BCA 301 Organizational Behaviour

Unit I Fundamentals of Organizational Behaviour:

Nature, Scope, Definition and Goals of Organizational Behaviour ,Fundamental Concepts of Organizational Behaviour,Models of Organizational Behaviour ,Emerging aspects of Organizational Behaviour: TQM, Managing Cultural Diversity, Managing the Perception Process

Unit II Attitude Values and Motivation:

Effects of employee attitudes Personal and Organizational Values Job Satisfaction Nature and Importance of Motivation Achievement Motive Theories of Work Motivation: Maslow's Need Hierarchy Theory, McGregcrs's Theory 'X' and Theory 'Y'

Unit III Personality:

Definition of Personality, Determinants of Personality Theories of Personality – Trait and Type Theories, The Big Five Traites, Mytes-Briggs Indicator, Locus of Control, Type A and Type B Assessment of Personality

Unit IV Work Stress:

Meaning and definition of Stress, Symptoms of Stress Sources of Stress: Individual Level, Group Level, Organizational Level Stressors, Extra Organizational Stressors Effect of Stress – Burnouts Stress Management – Individual Strategies, Organizational Strategies Employee Counselling

Unit V Group Behaviour and Leadership:

Nature of Group, Types of Groups Nature and Characteristics of team building, Effective Teamwork Nature of Leadership, Leadership Styles Traits of Effective Leaders

Books Recommended:-

1. Organizational Behavior Text, Cases and Games- By K. Aswathappa, Himalaya Publishing House, Mumbai, Sixth Edition (2005)

2. Organizational Behavior Human Behavior at Work By J. W. Newstrom, Tata McGraw Hill Publishing Company Limited, New Delhi, 12 th Edition (2007)

3. Organizational Behavior - By Fred Luthans 4. Organizational Behavior - By Super Robbins

5. Organizational Behavior - Anjali Ghanekar

6. Organizational Behavior Fandamentals, Realities and Challenges By Detra Nelson, James Campbell Quick Thomson Publications

7. Organizational Behavior through Indian Philosophy By N. M. Mishra, Himalaya Publication House

BCA 302 Optimization Techniques

Unit I

Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem – Formulation of LPP, Graphical solution of LPP. Simplex Method, Artificial variables, big-M method, two-phase method, degeneracy and unbound solutions.

Unit II

Transportation Problem.Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method. Optimality test: the stepping stone method and MODI method. Assignment model. Formulation. Hungarian method for optimal solution. Solving unbalanced problem. Traveling salesman problem as assignment problem.

Unit III

Sequencing models. Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines. Replacement Models. Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value. Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

Unit IV

Dynamic programming. Characteristics of dynamic programming. Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

Unit V

Inventory models. Inventory costs. Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

TEXT BOOKS:

1. A.M. Natarajan, P. Balasubramani, A. Tamilarasi, "Operations Research", Pearson Education, 2005.

2. P Sankara Iyer, "Operations Research", Tata McGraw-Hill, 2008.

BCA 303 Computer Graphics

Unit I Introduction to Computer Graphics:

What is Computer Graphics, Computer Graphics Applications, Computer Graphics Hardware and software, Working of CRT,LED,LCD,Plasma ,moniters
Line drawing algorithms: DDA, Bresenham's; Circle drawing algorithms: Using polar coordinates, Bresenham's circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Unit II Two/Three Dimensional Viewing:

The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).
Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.
Three dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Unit III Viewing in 3D:
Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.
Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.
Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Unit IV Illumination, shading, image manipulation:
Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Unit V Color Model :
Light, basic characterstic of light ,colour, CIE Chromatiicity digram, color models (XYZ,RGB,CMY,CMYK,HSV,YIQ,HLS,HIS),Conversions between color models.

Text Books:

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley

2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI

3. Computer graphic by Udit Agarwal

BCA 304 Computer System Architecture

Unit I Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters) Store program control concept, Instruction Code, Computer registers, instruction Cycle, Memory reference instruction, Input and output interrupt, Flynn's classification of computers (SISD, MISD, MIMD

Unit II Instruction Set Architecture:

Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid);

Unit III CPU :

Basic non pipelined CPU Architecture and Memory Hierarchy & I/O Techniques CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch- Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining. The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations.

Unit IV Introduction to Parallelism and Computer Organization [80x86]:

Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview). Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy.

Text Books:

• Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.

• Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

BCA305 Object Oriented Programming with C++

Unit I 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,

Unit II 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.

Unit III 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.

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

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

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

Unit VII Input-output and files:
Stream classes, output with ostream 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 401 Digital Communication and Networks

Unit I : Networking - Needs and Advantages, Network, Types- Client, Server and Peers, introduction to various types of servers. Transmission technology - Signal Transmission-Digital signaling, Analog Signaling, Asynchronous & synchronous Transmission, Wired & Wireless transmission, Base band and Broadband transmission, Transmission Media types-properties & specialty of various media – types, comparative study. Network Topology-Bus, Star, Ring, Star bus, Star ring, Mesh – Features, Advantages and disadvantages of each type.

Unit II : Network adapters – working principals, configuration and selection, Network Protocols-Hardware Protocols, software Protocols. The theoretical Network Model - OSI IEEE 802 standards, 802.3, 802.4, 802.5 Real World Networks – Ethernet, Fast Ethernet, Token Rings, FDDI, ATM, ARCnet and AppleTalk.

Unit III : Network Scaling-No. of nodes, distance, software, speed, special requirements Connectivity Devices: Modem, Repeater, Hub – Active, Passive and Intelligent, Bridge-Local, Remote, Wireless, Routers-Static and Dynamic, Switches and its types . Routers and Gateways. Overview of TCP/IP reference model. TCP/IP Protocol suites – Comparison between OSI and TCP/IP Models, Classification of TCP/IP protocols- IP, TCP, UDP, ARP, ICMP. TCP/IP Services Protocols- DHCP, DNS, WINS, FTP, SMTP, TELNET, NFS. IP Addressing and Subnet- IP Address – Class A, B & C. Domain Name Addressing, URL, e-mail address, Subnet & subnet mask.

Unit IV : Network building blocks requires for setting up a small LAN using Windows in a office, Hardware & software required, Simple Installation and configuration of Networking under Windows. Using HyperTerminal in Windows, overview and using Network Setup Wizard in Windows, Some basic networking configuration using Windows 95/98/XP/2000/2003 Server and clients, Simple network administration. Setting up Internet Connection Sharing in Windows.

Unit V : Network Security : Network security issues, common threats, security barriers in the network pathways, Official levels of computer security, types of security controls, approaches to network security, Ethical hacking. Firewalls – Need and features of firewalls, types of firewall technology- network level and application level, IP packets filter screening routers, limitations of firewalls. Encryption and Decryption – Cryptography, Type of encryptions, encryption keys, single/ secrete/ private key encryption, Public/Private key encryption. Overview of Digital Signature and Digital Certificates technology.

TEXT BOOKS

1. Ames Chellis Charles Perkins, Matthew Strebe "Networking Essentials:Study Guide MCSE", Second Edition, BPB Publications.

2. S.K.Basandra & S. Jaiswal, “Local Area Networks”, Galgotia Publications
3. MCSE Windows 2000 Network Infrastructure Design
4. Andrew & Tanenbaum, “Computer Network ”
5. William Stallings, “Data and Computer Communication”
6. Prakash C Gupta, “Data Communication

BCA 402 Numerical Analysis and Statistical Techniques

Unit I 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.

Unit II 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.

Unit III Correlation and Regression Analysis:

Scatter diagram,Karlpearson,Spearman and Concurrent deviation methods,regression lines,Method of least square.

Unit IV Probabiltiy & Probablity Distribution:

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

Unit V 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 403 Unix and shell Programming

Unit I General Overview of the System:

What is UNIX?,System structure, user perspective,O/S services assumption about Hardware,The Kernel and buffer cache architecture of Unix O/S, System concepts, Kernel data Structure, System administration,Buffer headers,Structure of the buffer pool, Scenarios for retrieval of the buffer, Reading and writing disk block, Advantage and disadvantage of buffer cache.

Unit II Internal Representation of Files:

INODES, Structure of regular,Directories conversions of a path name to an inode, Super block, Inode assignment to a new file, Allocation of disk blocks.

System Calls for the System:

Open read write file and record close, File creation, Operation of special files change directory and change root,change owner and change mode, STAT and FSTAT, PIPES Mounting and unmounting files system,Link Unlink.

Unit III Structures of Processes and process control:

Process states and transitions layout of system memory, the context of a process,manipulation of process address space,Sleep process creation/termination. The user Id of a process, Changing the size of a process. The SHELL

Interprocess Communication and multiprocessor system:

Process tracing system V IPO network communication sockets problem of multiprocessors systems, solution with master and hare process, and solution with semaphores.

Unit IV Introduction to shell scripts:

Types of shells,Shell functionality,Environment,shell Bourne shell,C shell, Unix commands, permissions, editors,filters sed, grep family, shell variables,scripts,metacharacters and environment,if and case statements, for while and until loops.Shell programming.

Unit V Awk and perl Programming:

Awk built in variable names and operators, arrays, strings, functions, perl; the chop() function,variable and operators, $_ and $. , Lists, arrays, regular expression and substitution, file handling, subroutines,formatted printing. Linux:History & Features of Linux, Linux structure, various flavours of linux.

BOOKS

1. M.J. Bach "Design of UNIX O.S. ", Prentice Hall of India.
2. Y.Kanetkar "Unix shell programming", BPB Pub.
3. B.W. Kernighan & R. Pike, "The UNIX Programming Environment", Prentice Hall of India, 1995.
4. S. Prata "Advanced UNIX: A Programming's Guide", BPB Publications, New Delhi.

5. Vikas/Thomsaon "Jack Dent Tony Gaddis "Guide to UNIX using LINUX" Pub.House Pvt. Ltd.
6. Linux complete, BPB Publications
7. Linux Kernel, Beck Pearson Education, Asia.
8. Sumitabha Das " Unix concepts and Applications".

BCA404 Environmental Science

Unit I The Multidisciplinary nature of environmental studies:

Definition, scope and importance Need for public awareness

Unit II Natural Resources:

Renewable and non-renewable resources Natural resources and associated problems a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people.

Water resources: Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.

Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.

Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problem, water logging, salinity, case studies.

Energy resources: Growing energy needs, renewable and energy sources, use of alternate energy sources, case studies.

Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

Unit III Ecosystems:

Concept of an ecosystem Structure and function of and ecosystem. Producers, consumers and decomposers Energy flow in the system Ecological succession Food chains, food webs and ecological pyramids Introduction, types, characteristic features, structure and function of the following ecosystem:- forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystem(ponds, streams, lakes, rivers, oceans, estuaries).

Unit IV Biodiversity and its Conservation:

Introduction- definition, genetics, species and ecosystem diversities Bio geographical classification of India Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, national and local level. India as a mega-diversity nation. Hot-spots of biodiversity Threats to biodiversity: habitat loss, poaching of

wild life, man-wild-life conflicts. Endangered and endemic species of India. Conservation of biodiversity: In-situ and ex-situ conservation of biodiversity

Unit V Environmental Pollution:

Definition Causes, effects and control measure of a. air pollution b. water pollution c. soil pollution d. marine pollution e. noise pollution f. thermal pollution g. nuclear pollution Solid waste management: Causes, effects and control measures of urban and industrial waste. Role of individual in prevention of pollution , pollution case studies Disaster management: floods, earthquake, cyclone and landslides.

Unit VI Social Issues and the Environment:

From unsustainable to sustainable development Urban problems related to energy Water conservation, rain water harvesting, watershed management Resettlement and rehabilitation of people, its problem and concern, case studies. Environmental ethics: issues and possible solutions Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. Waste land reclamation Consumerism and waste product Environment protection acts Air(prevention and control of pollution) acts Wild life protection act Forest conservation act Issues involved in enforcement of environmental legislation, public awareness.

Unit VII Human Population and the Environment:

Population growth, variation among nations Population explosion- family welfare programme Environment and human health Human rights Value education HIV/ AIDS Women and child welfare Role of information technology in environment and human health Case studies

Unit VIII Field work:

Visit to a local area to document environmental assets- river/forest/grassland/hill/mountain Visit to a local polluted site- urban/rural/ industrial/ agricultural Study of common plants, insects, birds Study of simple ecosystem, ponds, river, hill slopes etc.

Recommended Readings:

(i) Environmental Studies, Anindita Basak; Pearson Education.

BCA 405 Java Programming

Unit I

Core Java Introduction to Java, Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AVVT & Applet Programming.

Unit II

Networking Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, Advanced Socket Programming, Database Networking ,The Design of JDBC. The Structured Query Language, JDBC Installation, Basic JDBC Programming Concepts, Query Execution, Scrollable and Updatable Result Sets, Metadata, Row Sets, Transactions, Advanced Connection Management, Introduction of LDAP

Unit III

Distributed Objects The Roles of Client and Server, Remote Method Invocations, Setup for Remote Method Invocation, Parameter Passing in Remote Methods Server Object Activation, Java IDL and CCRA, Remote Method Calls with SOAP , Swing Lists, Trees, Tables, Styled Text Components, Progress Indicators, Component Organizers

Unit IV

AWT The Rendering Pipeline, Shapes, Areas, Strokes, Paint, Coordinate Transformations, Clipping, Transparency and Composition, Rendering Hints, Readers and Writers for Images, Image Manipulation, Printing. The Clipboard, Drag and Drop.

Unit V

Javabeans Components Beans, The Bean-Writing Process, Using Beans to Build an Application, Naming Patterns for Bean Components and Events Bean Property Tubes Bean info Classes Property Editors Customizes.

Unit VI

Security Class Loaders, Byte code Verification, Security Managers and Permissions, Digital Signatures, Code Signing, Encryption.

Text Book:

Core JavaTM 2, Volume II-Advanced Features, 7th Edition by Cay Horetmann, Gary Cornelll Pearson Publisher, 2004

BCA 501 Software Engineering

Unit I Introduction: Software Processes & Characteristics, Software life cycle Models - Waterfall, Prototype, Evolutionary and Spiral Models Software Requirements analysis & specifications: Requirement engineering, requirement, elicitation techniques like FAST, QFD, requirements analysis using DFD, Data dictionaries, ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.

Unit II Introduction to Software Engineering : Definitions, Size Factors, Quality and Productivity Factors, Managerial Issues, Planning a Software Project : Defining the Problem, Goals and Requirements, Solution Strategy , Planning the Development Process : Various Models, Planning an Organizational Structure, Planning Activities.

Unit III Software Cost Estimation: Introduction - Software Cost Factors - Software Cost Estimation Techniques - Stating Level estimation - Estimating Software Maintenance Costs Software Requirements Definition - Software Requirements Specification - Specification Techniques - Languages and Processors for Requirements.

Unit IV Software Design: Design concepts, Modules And Modularization Criteria, Design Notations, Design Techniques, Design Considerations, Real Time and Distributed System Design, Test Plans , Milestones, Walkthroughs and Inspections. Design Guidelines Implementation Issues : Structure Loading Techniques, Coding Style , Standards And Guidelines, Documentation Guidelines.

Unit V Modern programming Language Features: Type Checking, Separate Compilation, User Defined Data Types, Data Abstraction, Scoping Rules, Exception Handling, Currency Mechanism Verification And Validation Techniques, Quality Assurance, States Analysis, Symbolic Excretion.

Unit VI Testing And Debugging: System Testing, Formal Verification Software Maintenance, Maintainability, Managerial Aspect Of Software Maintenance, Configuration Management, Source Code Metrics, Other Maintenance Tools And Techniques.

Text Books

1. Software Engineering Concepts 1997 Edition Author : RICHARD FAIRLEY Publishers : TATA Mc GRAW-Hill Edition.

2. Software Engineering VI Edition, Author : ROGER S . PRESSMAN Publishers TATA McGRAW - HILL International Edition.

3. Software Engineering Programs Documentation Operating procedures

4. Author : K.K. AGGARWAL & YOGESH SINGH Publishers : NEW AGE INTERNATIONAL PUBLISHERS

BCA502 Artificial Intelligence

Unit I Introduction:

Intelligent Agents, Agents and environments, Good behaviour, The nature of environments, structure of agents, Problem Solving, problem solving agents, example problems, searching for solutions, uniformed search strategies, avoiding repeated states, searching with partial information.

Unit II Searching Technique:

Informed search and exploration, Informed search strategies, heuristic function, local search algorithms and optimistic problems, local search in continuous spaces, online search agents and unknown environments, Constraint satisfaction problems (CSP), Backtracking search and Local search for CSP, Structure of problems, Adversarial Search, Games, Optimal decisions in games, Alpha, Beta Pruning, imperfect real-time decision.

Unit III Knowledge Representation:

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects.

Unit IV Learning:

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

Unit V Applications:

Communication ,Communication as action, Formal grammar for a fragment of English, Syntactic analysis, Augmented grammars, Semantic interpretation, Ambiguity and disambiguation, Discourse understanding, Grammar induction, Probabilistic language processing, Probabilistic language models, Information retrieval, Information Extraction, Machine Translation.

TEXT BOOK

1. Stuart Russell, Peter Norvig, “Artificial Intelligence – A Modern Approach”, 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

BCA 503 (a) Python

Unit I Introduction to Python: An introduction to the Python programming language. Covers details of how to start and stop the interpreter and write programs. Introduces Python's basic data types, files, functions, and error handling.

Working with Data: A detailed tour of how to represent and work with data in Python. Covers tuples, lists, dictionaries, and sets

Unit II Program Organization and Functions: More information about how to organize larger programs into functions. A major focus of this section is on how to design functions that are reliable and can be easily reused in other settings. Also covers technical details of functions including scoping rules, documentation strings, and anonymous functions.

Unit III Classes and Objects: An introduction to object-oriented programming in Python. Describes how to create new objects, overload operators, and utilize Python special methods. Also covers basic principles of object oriented programming including inheritance and composition.

Unit IV Testing, Debugging, and Software Development Practice: This section discusses many issues that are considered important to Python software development. This includes effective use of documentation strings, program testing using both the doc test and unittest modules, and effective use of assertions. The Python debugger and profiler are also described.

Unit V Iterators and Generators: Covers the iteration protocol, Iterable objects, generators and generator expressions. A major focus of this section concerns the use of generators to set up data processing pipelines--a particularly effective technique for addressing a wide variety of common systems programming problems (e.g., processing large data files, handling infinite data streams, etc.).

BCA 503 (b) .Net Framework and C#

Unit I

The .NET Framework: Introduction, Common Language Runtime, Common Type System, Common Language specification, The Base Class Library, The .Net class library Intermediate language, Just-in time Compilation, Garbage Collection, Application Installation and Assemblies, Web services, Unified classes.

Unit II

C# Basics: Introduction, Data Types, Identifiers, Variables and constants, C# statements, Object Oriented Concept, Object and Classes, Arrays and Strings, System collections, Delegates and Events, Indexes, Attributes, versioning.

Unit III

C# Using Libraries: Namespace- System, Input Output, Multi Threading, Networking and Sockets, Data Handling, Windows Forms, C# in web application, Error Handling.

Unit IV

Advanced Features Using C# : Web services, Windows services, messaging, Reflection, COM and C#, Localization.

Unit V

Advanced Features Using C# : Distributed Application in C#, XML and C#, Unsafe Mode, Graphical Device Interface with C#, CASE Study (Messenger Application)

References:

1. Jeffrey Richter, " Applied Microsoft .NET Framework Programming", (Microsoft)
2. Fergal Grimes, " Microsoft .Net for Programmers", (SPD)
3. Balagurusamy, " Programming with C# ", TMH

BCA 504 Theory of Computation

Unit I Automata:
Introduction to formal proof, Additional forms of proof , Inductive proofs ,Finite Automata (FA) ,Deterministic Finite Automata (DFA),Non-deterministic Finite Automata (NFA),Finite Automata with Epsilon transitions.

Unit II Regular Expression and Languages :
Regular Expression ,FA and Regular Expressions , Proving languages not to be regular, Closure properties of regular languages , Equivalence and minimization of Automata.

Unit III Context-free Grammars and Languages :
Context-Free Grammar (CFG),Parse Trees,Ambiguity in grammars and languages,Definition of the Pushdown automata,Languages of a Pushdown Automata,Equivalence of Pushdown automata and CFG,Deterministic Pushdown Automata.

Unit IV Properties of Context-free Languages:
Normal forms for CFG,Pumping Lemma for CFL,Closure Properties of CFL,Turing Machines,Programming Techniques for TM.

Unit V Undecidabality:
A language that is not Recursively Enumerable (RE)**,**An undecidable problem that is RE, Undecidable problems about Turing Machine**,** Post's Correspondence Problem, The classes P and NP.

TEXT BOOK:

1. J.E. Hopcroft, R. Motwani and J.D. Ullman, "Introduction to Automata Theory,Languages and Computations
2. H.R. Lewis and C.H. Papadimitriou, "Elements of the theory of Computation", Second Edition, Pearson Education,
3. Thomas A. Sudkamp," An Introduction to the Theory of Computer Science, Languages and Machines", Third Edition, Pearson Education,
4. Raymond Greenlaw an H.James Hoover, " Fundamentals of Theory of Computation, Principles and Practice", Morgan Kaufmann Publishers, 1998.

5. Micheal Sipser, “Introduction of the Theory and Computation”, Thomson Brokecole,
6. J. Martin, “Introduction to Languages and the Theory of computation” Third Edition, Tata Mc Graw Hill, 2007

BCA 505 Web Technology

Unit I

HTML, Browsers and their types, URL’s, web sites, Domain Names, static and dynamic sites and active web pages, Files Creation, Web Server, Web Client/Browser Hyper Text Markup Language, HTML Tags, Paired Tags, Commonly used HTML Commands Titles and Footers, Paragraph Breaks, Line Breaks, Heading Styles, Drawing Lines, Text Styles, Other Text Effects, Indenting Text, Lists, Types of Lists.

Unit II

Using the Border attribute, Using the Width and Height Attribute, Using the Align Attribute, Using the ALT Attribute, Tables - Header, Data rows, The Caption Tag, Attributes - Width and Border, cell padding, BGCOLOR, COLSPAN, ROWSPAN, External Document References, Internal Document References, Images as Hyperlinks, Introduction to Frames, tag, <FRAME> tag, Targeting Named Frame. DHTML

Unit III

JavaScript, Advantages, JavaScript Syntax, Data Types and Literal, Type Casting, Variables, Incorporating variables in a Script, Array, Operators and Expressions, Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, Conditional Expression, Ternary and Special Operators, JavaScript Programming Constructs, If - then - else, Immediate If, For Loop, Built-in Functions, User Defined functions,

Unit IV

JavaScript Assisted Style Sheets DOM (JSSS DOM), Understanding Objects in HTML-Properties, Methods, Browser Objects - The Web Page HTML Object Hierarchy, Access to Elements of a Web Page, How a Web Page Element is Manipulated, Handling, WEB PAGE, Events Using JavaScript, Named JavaScript Event handlers.

Unit V

The Form Object, The Form Object’s Methods, Text Element, Password Element, Button Element, Submit Button Element, Reset Button Element, Checkbox Element, Radio Element, Text Area Element, Select and Option Element, Multi Choice Select Lists Element, Other Built-In Objects in JavaScript - String, Math, Date Object, Creating a User Defined Object, Instances, Objects within Objects.

GUIDELINES FOR SUBMISSION OF BCA FINAL YEAR (VI Semester) PROJECT

All the candidates of BCA are required to submit a project-report based on the work done by him/her during the major/minor/summer assignment period.

SUMMARY/ABSTRACT

All students must submit a summary/abstract separately with the project report. Summary, preferably, should be of about 3-4 pages. The content should be as brief as is sufficient enough to explain the objective and implementation of the project that the candidate is going to take up. The write up must adhere to the guidelines and should include the following:

- Name / Title of the Project
- Statement about the Problem
- Why is the particular topic chosen?
- Objective and scope of the Project
- Methodology (including a summary of the project)
- Hardware & Software to be used
- Testing Technologies used
- What contribution would the project make?

TOPIC OF THE PROJECT- This should be explicitly mentioned at the beginning of the Synopsis. Since the topic itself gives a peep into the project to be taken up, candidate is advised to be prudent on naming the project. This being the overall impression on the future work, the topic should corroborate the work.

OBJECTIVE AND SCOPE: This should give a clear picture of the project. Objective should be clearly specified. What the project ends up to and in what way this is going to help the end user has to be mentioned.

PROCESS DISCRIPTION: The process of the whole software system proposed, to be developed, should be mentioned in brief. This may be supported by DFDs / Flowcharts to explain the flow of the information.

RESOURCES AND LIMITATIONS: The requirement of the resources for designing and developing the proposed system must be given. The resources might be in form of the hardware/software or the data from the industry. The limitation of the proposed system in respect of a larger and comprehensive system must be given.

CONCLUSION: The write-up must end with the concluding remarks- briefly describing innovation in the approach for implementing the Project, main achievements and also any other important feature that makes the system stand out from the rest.

The following suggested guidelines must be followed in preparing the Final project Report:

Good quality white A4 size paper should be used for typing and duplication. Care should be taken to avoid smudging while duplicating the copies.

Page Specification :(Written paper and source code)

- Left margin - 3.0 cms
- Right margin- 2.0 cms
- Top margin 2.54 cms
- Bottom margin 2.54 cms
- Page numbers - All text pages as well as Program source code listing should be numbered at the bottom center of the pages.

Normal Body Text: Font Size: 12, Times New Roman, Double Spacing, Justified. 6 point above and below para spacing
Paragraph Heading Font Size: 14, Times New Roman, Underlined, Left Aligned. 12 point above & below spacing.
Chapter Heading Font Size: 20, Times New Roman, Centre Aligned, 30 point above and below spacing. **Coding Font size :** 10, Courier New, Normal
Submission of Project Report to the University : The student will submit his/her project report in the prescribed format. The Project Report should include:

1. One copy of the summary/abstract.
2. One hard Copy of the Project Report.
3. Soft copy of project on CD in a thick envelope pasted inside of the back cover of the project report.
4. The Project Report may be about 75 pages (excluding coding).

FORMAT OF THE STUDENT PROJECT REPORT ON COMPLETION OF THE PROJECT

- Cover Page as per format
- Acknowledgement
- Certificate of the project guide/Centre Manager as at Annexure III *f* Certificate of the Company/Organisation(for direct candidates)
- Synopsis of the Project
- Main Report
    - ❖ Objective & Scope of the Project
    - ❖ Theoretical Background Definition of Problem
    - ❖ System Analysis & Design vis-a-vis User Requirements

- ❖ System Planning (PERT Chart)
- ❖ Methodology adopted, System Implementation & Details of Hardware & Software used System Maintenance & Evaluation
- ❖ Cost and benefit Analysis
- ❖ Detailed Life Cycle of the Project
    - ➢ ERD, DFD
    - ➢ Input and Output Screen Design
    - ➢ Process involved
    - ➢ Methodology used testing
    - ➢ Test Report, Printout of the Report & Code Sheet

Formats of various certificates and formatting styles are as:

1) **Certificate from the Guide**

CERTIFICATE

This is to certify that this project entitled " xxxxxx xxxxx xxxxx xxxx xxxx xxx" submitted in partial fulfillment of the degree of Bachelor of Computer Applications to the "xxxxxxxxxxxxxxxxxxxxxxxxxx" through xxxxxx xxxxx (Study Centre Name), done by Mr./Ms._____, Roll No. _____ is an is an authentic work carried out by him/her at _____ under my guidance. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Signature of the student Signature of the Guide

2) **Project Report Cover Page Format:**

Title of the Project/report

(Times New Roman, Italic, Font size = 24)

Submitted in partial fulfilment of the requirements

for the award of the degree of Bachelor of Computer

Applications

(Bookman Old Style, 16 point, centre)

Guide
(Guide Name)

Submitted by:
(Student's name)

Roll No

Submitted to

Xxxxxxxx

STUDY CENTRE

Study Centre Name and City

3) **Self certificate by the students**

SELF CERTIFICATE

This is to certify that the dissertation/project report entitled "_____" is done by me is an

authentic work carried out for the partial fulfillment of the requirements for the award of the degree of Bachelor of Computer Applications under the guidance of _____. The matter embodied in this project work has not been submitted earlier for award of any degree or diploma to the best of my knowledge and belief.

Signature of the student
Name of the Student
Roll No.
Study Centre Name

4) **ACKNOWLEDGEMENTS**

In the "Acknowledgements" page, the writer recognizes his indebtedness for guidance and assistance of the thesis adviser and other members of the faculty. Courtesy demands that he also recognize specific contributions by other persons or institutions such as libraries and research foundations. Acknowledgements should be expressed simply, tastefully, and tactfully.