M.J.P. Rohilkhand University, Bareilly
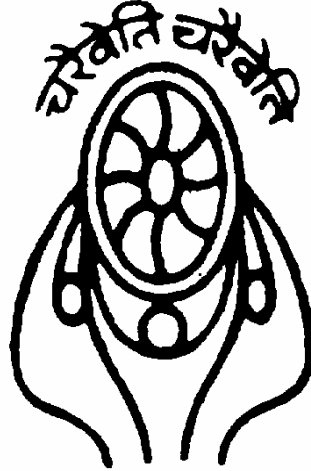
Course Structure & Detailed Syllabi

For

Bachelor of Computer Application

(w.e.f. session: 2009-10)

Note: The new course structure and syllabi will be effective from the academic session 2009-10. Therefore those students who will be enrolled/admitted in BCA first year from session 2009-10 & onwards will study according to this new syllabus and the students admitted in session 2008-09 (now studying in BCA II year) and 2007-08 (now studying in BCA III year) will follow old syllabus.

Ist SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
Theory Courses			L	T	P	End Sem Exam	Sessional	Total
1.	BCA – 101	Mathematics-I	4	2	-	70	30	100
2.	BCA- 102	Technical Writing	4	2	-	70	30	100
3.	BCA –103	Computer Fundamentals and Programming Concepts	4	2	-	70	30	100
4.	BCA – 104	Principals of Management	4	2	-	70	30	100
Practical Course								
5.	BCA – 105 P	Computer Fundamental Lab (based on BCA – 103)	-	-	6	100	-	100

IInd SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
Theory Courses			L	T	P	End Sem Exam	Sessional	Total
1.	BCA – 201	Mathematics-II	4	2	-	70	30	100
2.	BCA – 202	Programming in C	4	2	-	70	30	100
3.	BCA – 203	Discrete Mathematics	4	2	-	70	30	100
4.	BCA – 204	Digital Electronics	4	2	-	70	30	100
Practical Course								
5.	BCA – 205 P	Computer Fundamental Lab (based on BCA – 202)	-	-	6	50	-	50
6.	BCA – 206 P	Digital Electronics Lab(Based on BCA –204)	-	-	6	50	-	50

IIIrd SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
			L	T	P	End Sem Exam	Sessional	Total
Theory Courses								
1.	BCA – 301	Computer Oriented Numerical Methods	4	2	-	70	30	100
2.	BCA – 302	Data Structure	4	2	-	70	30	100
3.	BCA – 303	Computer Organization	4	2	-	70	30	100
4.	BCA – 304	Object Oriented design and Programming in C++	4	2	-	70	30	100
Practical Course								
5.	BCA – 305 P	Data Structure Lab(Based on BCA – 302)	-	-	6	50	-	50
6.	BCA – 306 P	C++ Programming Lab(Based on BCA -304)	-	-	6	50	-	50

IVth SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
			L	T	P	End Sem Exam	Sessional	Total
Theory Courses								
1.	BCA – 401	Organizational Behavior	4	2	-	70	30	100
2.	BCA – 402	Operating System	4	2	-	70	30	100
3.	BCA – 403	Data Base Management System	4	2	-	70	30	100
4.	BCA – 404	Web Technology	4		2	70	30	100
Practical Course								
5.	BCA – 405 P	Software Lab (based on BCA – 403 & 404)	-	-	6	50	-	50
6.	BCA – 406 P	Unix and Shell Programming Lab	-	-	6	50	-	50

Vth SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
			L	T	P	End Sem Exam	Sessional	Total
Theory Courses								
1.	BCA – 501	Computer Graphics	4	-	2	70	30	100
2.	BCA – 502	Visual Basic	4	2	-	70	30	100
3.	BCA – 503	Java and Internet programming	4	2	-	70	30	100
4.	BCA – 504	Seminar	6	-	-	35	15	50
Practical Course								
4.	BCA – 505 P	Minor Project (Based on BCA -502)	-	-	6	100	-	100
5.	BCA – 506 P	Java and Internet programming (Based on BCA -503)	-	-	6	50	-	50

VIth SEMESTER

S.No	Code	Subject Name	Hours Per Week			Maximum Marks		
			L	T	P	End Sem Exam	Sessional	Total
Theory Courses								
1.	BCA – 601	Computer Networks	4	2	-	70	30	100
2.	BCA – 602	Advanced Internet programming	4	2	-	70	30	100
3.	BCA – 603	Management Information System	4	2	-	70	30	100
Practical Course								
4.	BCA – 604 P	Advanced Internet Programming Lab (based on BCA – 602)	-	-	6	50	-	50
5.	BCA – 605 P	Major Project	-	-	6	150	-	150

BCA - 101 <u>**MATHEMATICS – 1**</u>

UNIT : 1

DIFFERENTIAL CALCULUS: Successive differentiation, Leibnitz theorem, Partial differentiation, Euler's Theorem, change of variables, Jacobian theorem.

UNIT : 2

INTEGRAL CALCULUS: Integration of rational and Irrational functions, Reduction

Formulae, Definite Integral, Rectification; Quadrature, volumes and surfaces of Revolution, Simple applications of integration & simple problems of double and triple integrals.

UNIT : 3

DIFFERENTIAL EQUATION: Differential equations of first order, Differential equations of 2nd order, Differential of 2nd order with constant coefficients.

UNIT : 4

VECTOR CALCULUS AND ALGEBRA: Vectors, Differentiation and partial differentiation of vector functions, derivative of sum, Dot product and cross product of two vectors, gradient, divergence and curl.

UNIT : 5

COORDINATE GEOMETRY: Straight lines, Circles and the system of circles; standard equations and properties of Parabola. Ellipse and Hyperbolas, General equation of second degree in two variables, tracing of simple coinic section.

Suggested Readings :

1. E. Kreyzig, "Engineering Mathematics".
2. B.S. Grewal, "Higher Engineering Mathematics"
3. Shanti Narayan, "Differential Calculus"

BCA-102 TECHNICAL WRITING

UNIT: 1

Technical Documentation Presentation : Accuracy and Conciseness in Technical English, Structure Format etc. for Technical Reports & Thesis, Comparing and Contractive other aspects of short reports and long dissertations.

UNIT: 2

Communication Skills: Communication Process: Concept & importance, System of communication: Formal & internal. Barrier to effective communication.

UNIT: 3

Principles of Business Communication: Planning and conduction conversations, interviews and Discussion. The preparation of oral statements, effective listening, telephonic communication.

UNIT: 4

Written Communication: Guides to effective writing for business correspondence including letter and job application Memorandum, Office orders, Reports.

UNIT: 5

Non-Verbal Communication: Importance and Type-Cluster and congruency. Kinetics Voal CUes. Modern Forms of Communication: Telex, Fax, Telegram & Teleconferencing & E-mail.

UNIT: 6

Practical in Business Communication: Report writing, Public Speaking, Seminars, Presentation, Interview, Group Discussion, Effective Listening.

SUGGESTED READINGS:-
1. Lesikar " Business Communication" AITBC
2. S. M. Ray "Business Communication"   HP

BCA - 103: **COMPUTER FUNDAMENTALS AND PROGRAMMING CONCEPTS**

UNIT: 1

Computer Fundamentals : Introduction to Computers, History of Computers, Classification of Computers, Generations of Computers and their features, Fundamental units of Computer system- I/O devices, Primary and Secondary memories and their characteristics, Central Processing Unit.

UNIT: 2

Data Representation: Bits and Bytes, decimal, octal, binary and hexadecimal. Representation of integers, fixed and floating points, character representation: ASCII, EBSDIC.

Computer Software : Computer Programming Languages – Machine Language, Assembly Language, High Level Language, software and their classification System.

UNIT: 3

Programming Fundamentals: Algorithm development, Techniques of problem solving. Flowcharting, Stepwise refinement, Structured programming concepts; Top down Design, Development of efficient programs, Program Correctness, Debugging and testing of Programs.

UNIT: 4

Programming Using C: Representation of integers, float, characters Data types: constants and variables; scope of variables, C operators, Arithmetic Expressions, Decision Control Structures, Loop Control Structures, Standard C Library C Preprocessor.

UNIT: 5

Introduction of Array or subscripted variable, Type of array, Sorting and Searching Techniques. Manipulation of two dimensional arrays.

SUGGESTED READINGS:-
1. Computer Fundamentals by P.K. Sinha
2. Computer Fundamental and Concepts by V. Raja Raman
3. Let Us C by Yaswant P. Kanetkar
4. Programming in C by Dennis and Ritche
5. "Magic with C" AB Publication

BCA-104 : PRINCIPLES OF MANAGEMENT

UNIT : 1

Introduction, Concepts, Nature, Scope and Significance of Management, Evolution of Management thought–(Contribution Taylor, Weber and Fayol to Management) and Foundation of Management Theories.

UNIT : 2

Planning : Concept, Objectives, Nature, Limitation, Process of Planning, Importance, Forms, Techniques and Process of decision making.

UNIT : 3

Organising : Concept, Objectives, Nature of Organising, Types of Organisation. Delegation of authority. Authority and responsibilities, Centralisation and Decentralisation, Span of control.

UNIT : 4

Directing : Concept. Principal & Techniques of directing and Coordination, Concept of leadership-Meaning, Importance, Styles, Supervision, Motivation, Communication.

UNIT : 5

Controlling Concept, Principles, Process and Techniques of controlling, Relationship between planning and controlling.

UNIT : 6

Relevance of Computer Applications in Different Functional Areas of Management viz.: Financial Management, Production Management, Human Resources Management and Marketing Management.

SUGGESTED READINGS :

1. Parag Diwan & L.N. Agarwal, "Management Principles & Practices".
2. Fred Luthans, "Organisational Behaviour"
3. LM. Prasad, "Principles & Practices of Management"

BCA-201 :   MATHEMATICS-II

UNIT : 1

The real number system as a complete ordered filed neighborhood open and closed

sets limit points of sets.

UNIT : 2

Limits and Continuity: Definition of Limit, Algebra of Limits, Right hand and Left hand Limits, Definition of Continuity, Types of Discontinuity and algebra of Continuous functions.

UNIT : 3

Infinite Series: Convergent series, Divergent series Oscillatory series, Leibnitz test(Alternating Series test), Positive term series test, p-series test, Comparison test, D'Almberts ratio test, Cauchy's nth root test and Rabbe's test.

UNIT : 4

Mean Value Theorems : Rolle's Theorem, Lagrange's Mean Value theorem, Cauchy's Mean Value theorem and Maclaurin series for Sin x, Cos x, Tan x, log(1-x), $\log(1+x)^m$, e^x etc, Indeterminate forms, maxima and minima(Application of maxima or minima to simple problems).

UNIT : 5

Sequence : Sequence, Subsequence, Bounded Sequence, Convergent Sequence, Divergent Sequence, Monotonic Sequence, Cauchy Sequence.

Suggested Readings-

1. E. Kreyzing Engineering Mathematics
2. Gorakha Prasad Differential Calculus
3. Shanti Narayan Differential Calculus
4. Prof. P.N. Chatterji Infinite Series

BCA-202   **PROGRAMMING IN 'C'**

UNIT: 1

Introduction of data types, Storage class, Operators, Operator precedence and associativity, Input/Output Functions, Sequential approach problems, If-else statement, Nesting of if statement, compound conditional if statement, switch statement, nesting of switch statement, selected approach problems, goto statement, loop statements(while statement, do-while statement and for statement), repetitive structure problems. Nesting of while statement, Nesting of do-while statement, Nesting of for statement, break and continue statement, Multiple loop variable, comma operator.

UNIT: 2

Introduction of One Dimensional and Two dimensional array, Declaration, Initialization, manipulation of one dimensional array, Insertion, deletion of new element in array, sorting, searching and merging of one dimensional array. Matrix manipulation of two dimensional array.

UNIT: 3

Modular programming, user defined function, passing arguments by value and array parameter, local and global variable, nesting of function, Recursion. string manipulation by string handling functions. Structure and Union data type, nested structure, array of structure, passing structure to the function.

UNIT: 4

Introduction to Pointers, declaration, address arithmetic, pointer arithmetic, using pointer as function argument (call by reference), dynamic memory allocation and de-allocation.

UNIT: 5

File handling in C : creation of file, open a file, accessing, appending and deleting data of a file, updating data file, Defining and calling macros, standard c library and other standard c functions.

SUGGESTED READINGS:-

1. "Concept of 'C" by Robert laffore, TMH Publication.
2. "Programming in 'C" by E. Balaguruswami, TMH Publication
3. "Let Us C" by Yaswant P. Kanetkar, Narosa Publication
4. "Magic in C" AB Publication.

BCA-203:   **DISCRETE MATHEMATICS**

UNIT: 1

Mathematical Logic: Proposition & Propositional Form conditional and Bi-conditional Statements, Negation operation, Logic connectives and compound statements, conjunction, disjunction, truth tables, Duality conditional and in-conditional statements.

UNIT: 2

Boolean Algebra : Development of Boolean Algebra, Truth functions, The AND, OR, NOT operators, Laws of Boolean Algebras, Reducing Boolean Expressions, Boolean expressions and logic diagrams Universal Building blocks, Negative Logic Min terms, Truth tables and K-maps, Reduction of K maps Disjunctive normal form.

UNIT: 3

Graph theory: Definition of a graph, finite and infinite graphs, Incidence and degree, null graph, Sub graphs walks, Paths and circuits in a graph, connected graphs, Trees, Properties of Trees, Planner graphs. Incidence Matrix.

UNIT: 4

Function and Relation : Injective and surjective functions, composition of function, Inverse function, Use of function in coding theory, Relation composition of relation, Equivalence relation.

]

SUGGESTED READINGS:-

1. C.L. Liu, "Elements of Discrete Mathematics" Mc Graw Hill Book Co., 1985

2. N. Deop, "Graph Theory with applications to Engineering and Computer Science", PHI 1993.

3. B. Colman and Robert C. Busby, "Discrete Mathematical structure for Computer Science," PHI.

4. Olympia Nicodemi, "Discrete Mathematics" CBS Publication, Delhi.

5. M.N.S. Swamy and K. Thulasiraman, "Graphs, Networks and Algorithms," Wiley Inter Science, NY, 1989.

BCA-204   **DIGITAL ELECTRONICS**

UNIT: 1

Information Representation : Number system, binary, Octal Hexadecimal system, integers and real numbers, Conversion from one number system to another number system, Data representation in a register, Signed and Unsigned numbers 2's Complement and 1's Complement representation and Operation of]mbers(addition and subtraction),Floating point representation of numbers.

UNIT: 2

Switching Circuit Theory & Boolean Algebra: Introduction to digital Electronics, General Switching problems, algebra of relay contacts, Gates (OR, AND, NOR, NAND, XOR & XNOR), Truth tables, converting from Boolean Expression to logic gates. Venn diagrams theorems in Boolean algebra, Demorgan's laws, Boolean laws, Circuit Designing techniques (SOP, POS, K-Map).

UNIT: 3

Boolean Functions and Circuit Elements : Operation on Boolean function, Complementation, K-maps, Relation of NAND –NOR logic to AND-OR Logic, Mixed Logic, Half Adder and Full Adder circuit with truth tables, Binary to Decimal and Decimal to Binary Decoders, Multiplexers, Demultiplexer, Encoders.

UNIT: 4

Flip-Flops : Asynchronous & Synchronous flip-flops, The family of Flip Flop circuits- S-R Flip Flop, D Flip Flop, J-K Flip Flop, T Flip Flop, State table and Excitation Table, Race around condition & Master Slave Flip Flop and Propagation Time delay. Counters (Binary and UP-Down) and Registers (serial & parallel).

SUGGESTED READINGS:-

1. M.M. Mano, "Digital Logic and Computer Design" PHI 1998.

2. M.M. Mano, "Computer Architecture", PHI 1998.

3. Malvino and Leach, "Digital Electronics", TMH, 1998.

4. William Stallings, "Computer Organization and Architecture," PHI 1998.

BCA-301   Computer Oriented Numerical Analysis Methods

UNIT : 1

Roots of Equations : Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method. .

UNIT : 2

Interpolation and Extrapolation : Finite Differences, The operator E, Newton's Forward and Backward Differences ,Newton's divided differences formula, lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Stirling formula, Bessel's formula, Laplace-Everett formula.

UNIT: 3

Numerical Differentiation Numerical Integration : Introduction, direct methods,maxima and minima of a tabulated function, General quadrature formula, Trapezoidal rule, Simpson's One third rule,simpson's three-eight rule.

UNIT : 4

Solution of Linear Equations : Gauss's Elementation method and Gauss's Siedel iterative method.

UNIT : 5

Solution of Differential Equations : Euler's method, picard's method, Fourth-order rangi-Kutta method.

Suggested Readings:

1. Scarbourogh, "Numerical Analysis".

2. Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic press, Kolkata, 3. S.S. Shastri, "Numerical Analysis", PHI

BCA-302:   DATA STRUCTURES

UNIT: 1

Introduction to Algorithm Design and Data Structure: Introduction to Data Structure, Classification data Structure Design and analysis of algorithm, Top down and Bottom-up approaches to algorithm, complexity of algorithm.

UNIT: 2

Arrays, Stacks and Queues : Representation of array (single & multi dimensional arrays), String processing(String operation, Pattern matching Algorithm), Address calculation of array, Implementation of Stacks and Queues using array circular queues, dqueues, Priority queues, Application of stacks, Conversion from infix to Postfix and evolution of prefix expressions using stack.

UNIT: 3

Linked List : Single linked list, stacks and queues, polynomial representation and manipulation using linked list, polynomial addition, Representations of record in memory, circular linked list and doubly lined list, Generalized list, Sparse matrix representation using linked list.

UNIT: 4

Trees : Introduction to tree, binary search trees, Representing binary tree in memory, AVL tree, searching and insertion, deletion in binary search tree, recursive and non-recursive algorithms for traversal methods.

UNIT: 5

Searching and Sorting : Sequential search & binary search, hash table, sorting method(Insertion sort, Selection sort, Bubble sort, Quick sort, Merge sort, Counting sort, Heap sort, Radix sort, Shell sort).

SUGGESTED READINGS:-

1. Keringhan and Ritchie, "The C programming Language", PHI, 1990.
2. Kruse, Leung and Tondo, "Data Structures and Program Design in 'C', PHI.
3. Andrew Tenanbaum "Data structures using C& C++", PHI
4. Coreman "Introduction to algorithms", PHI

BCA - 303:   COMPUTER ORGANIZATION

UNIT: 1

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

UNIT: 2

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

UNIT: 3

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

UNIT: 4

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

SUGGESTED READINGS:-

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

BCA-304: OBJECT ORIENTED DESIGN AND PROGRAMMING IN C++

UNIT: 1

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

UNIT: 2

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

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

UNIT: 3

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

UNIT: 4

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

UNIT: 5

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

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

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

SUGGESTED READINGS:-

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

BCA – 401: ORGANISATIONAL BEHAVIOUR

UNIT: 1

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

UNIT: 2

Perception: Concept, Nature, Process, Importance. Management and Behavioural Applications of Perception.

Attitude: Concept, Process and Importance. Personality: Concept, Nature, Types and Theories.Learning: Concept and Theories of Learning.

UNIT: 3

Motivation: Concepts and Their Application, Principles, Theories.

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

UNIT: 4

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

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

UNIT: 5

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

SUGGESTED READING:-

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

BCA-402: OPERATING SYSTEM

UNIT: 1

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

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

UNIT: 2

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

UNIT: 3

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

UNIT: 4

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

UNIT: 5

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

Disk Scheduling: FCFS, C-Scan etc.

SUGGESTED READINGS:-

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

BCA-403:   DATA BASE MANAGEMENT SYSTEM

UNIT: 1

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

UNIT: 2

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

UNIT: 3

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

UNIT: 4

SQL: SQL construct, Type of SQL (Brief Overview), SQL Join: Multiple table queries, Built-in functions, Overview of ORACLE; (Data Type, DDL, DML, DCL).

UNIT: 5

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

SUGGESTED READINGS:

1. C.J. Date, "An introduction to Database system: Vol. 1, Addision Weseley.

2. Bipin Desai, "An introduction to Database system", Galgotia Publications, New Delhi.

3. Korth, "Database and its Concept", TMH.

4. DBMS, Katson Publication, New Delhi

BCA-404:   **WEB TECHNOLOGY**

UNIT: 1

History of the Internet and World Wide Web, Growth of the Web, Protocols- HTTP,FTP, SMTP, POP3, MIME,IMAP, Choosing an ISP, Introduction to Internet Services, E-mail concepts, Sending and Receiving secure E-Mail, Introduction to XML.

UNIT: 2

Web project, Web Team, Communication Issues, the Client, Multi- departmental & large scale Websites, Quality Assurance and Testing, Technological advances and Impact on Web Teams, Overview of Static or Dynamic Web page, Portal, Search engine.

UNIT: 3

HTML: Concept of Hypertext, Versions of HTML, Elements of HTML, Formatting Tags, Links, Hyperlinks, Image & Image map, List, Tables, Frames, Forms, Style sheets, Background and Color Controls.

DHTML: Introduction to DHTML, Advanced Netscape DHTML, Advanced Microsoft DHTML & Cross browser DHTML.

UNIT: 4

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 & Assemblies, Web Services, Unified classes.

UNIT: 5

ASP.NET: Features of ASP.NET, Differences between ASP and ASP.NET, Create an ASP.NET Web application, ASP.NET Web forms, ASP.NET Controls- Validation Controls, Web Server Controls, ADO.NET.

SUGGESTED READINGS:-

1. Burdman, "Collaborative Web Development", Addison Wesley.
2. Sharma & Sharma, "Developing E-Commerce Sites", Addison Wesley.
3. Ivan Bayross, "Web Technologies Part II", BPB Publications.
4. "ASP.NET 21 Days", TMH.
5. "Web Technology", Laxmi Publication.
6. DOT NET Framework with ASP.NET & C#", Dhanpat Rai Publication
7. Magic with HTML, DHTML and Javascript", Laxmi Publication

BCA-501:   **COMPUTER GRAPHICS**

UNIT: 1

Introduction: Development of Computer graphics, basic graphics and standards. Raster scan and Random scan graphics, continual refresh and storages displays, display processors and character generations. Color display techniques, frame buffer and Bit Operations concepts in raster graphics.

UNIT: 2

Drawing Techniques : Point, lines and curves, scan conversion, line drawing algorithms, circle and ellipse generation, polygon filling, conic –section generation, ant aliasing.

UNIT: 3

Two– dimensional: Two- dimensional viewing, basic transformations, coordinate system, windowing and clipping, segments, interactive picture construction techniques, interactive input and output devices.

UNIT: 4

Three–dimensional: Three- dimensional concepts, 3-D representation and transformation, 3-D viewing, algorithms for 3-D volumes spline curves and surfaces.

SUGGESTED READINGS:

1. Newman W.M. & Spraull R.F. "Principles of Interactive Computer Graphics", Mc Graw Hill, 1981.

2. Harington, "Introduction to Computer Graphics," Mc Graw Hill.

3. Hannen & Backer, Computer Graphics, PHI.

BCA- 502   **VISUAL BASIC**

UNIT: 1

Visual Basic overview and environment, Overview of main screen, Title bar, Tool bar, Tool box, Using menus/customizing a form, building the user interface, cradling controls, Command buttons, Text boxes, Labels, Image controls.

UNIT: 2

Program Elements: Statements in VB/ writing codes/ dialog box, variables/ types of variables/ strings/numbers. Writing procedures. VB program structure.

UNIT: 3

Project forms/ modules and frames. Projects with multiple forms. Displaying in formation on forms, Pictures boxes, Text boxes, Printer objects, controlling program flow.

UNIT: 4

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

UNIT: 5

Objects oriented programming / creating objects/building classes, Simple programs in Visual Basic.

SUGGESTED READINGS:-

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

BCA-503:   JAVA AND INTERNET PROGRAMMING

UNIT: 1

Object oriented programming, Overview of java, java programming design, importance and limitations of java. Java Developer Kit, Data Types: constant and variables, arrays, strings, expression and operators, Reference variables, Conditional and loop statements.

UNIT: 2 Classes, packages and interfaces, Encapsulation, Polymorphism, Dynamic Binding, Overloading, Overriding, inheritance, interfaces and Packages, initializing and class loading.

UNIT: 3

I/O package, Language package and utilities packages, Introduction to Applet Programming. Programming a Graphical User Interface, Building a Simple User Interface, Laying out a User Interface.

UNIT: 4

Exception handling in java, Event handling, multiple threading and thread control, thread life cycle, Synchronization, daemon threads.

UNIT: 5

I/O handling in java, stream classes, Input stream, Output Stream, Byte Stream, Character Stream, reading a file, writing to a file, I/O exceptions.

SUGGESTED READINGS:-

1. "Complete reference". By Patric Naughton, Tata McGraw Hill.

2. Core Java Volume-I, Horstman and Cornell, Pearson Education

3. "Programming in java" by E. Balaguruswamy. TMH Publication.

.

BCA – 504:   SEMINAR

Each student has to select a topic based on current developments and technologies to deliver a seminar. The student has to study and analyze the chosen topic independently and prepare a seminar report under the guidance of a faculty member of the college. Finally each student has to prepare power-point presentation based on the contents of the seminar report and deliver the seminar in the presence of the other students and faculty member of the college. **The evaluation would be done for 15 marks by internal examiner and for 35 marks by the external examiner.** College principals are required to submit a copy of the seminar reports of all the students to the University for External Assessment before the end semester examination.

Guidelines for seminar report preparation:

(a)   Every seminar report must have a title page consisting the title of the seminar, student name and roll number, seminar guide name, and college name.

(b)   Every seminar report must have candidate's declaration signed by the student, and certificate from seminar guide and college principal duly signed with seal.

(c)   There should be abstract, acknowledgement, index, introduction, conclusion, and references besides other chapters related to the topic in every seminar report.

Guidelines for internal assessment of the seminar report (15 marks):

(a)   5 marks should be given for the attendance. All the students are required to attend the seminars of all other students. Attendance of all the present students should be taken during every seminar. Based on the presence of the student during the seminars marks should be awarded.

(b)   5 marks would be evaluated for the quality of work.

(c)   5 marks would be evaluated according to the performance of the student based on quality of slides, confidence, and communication skills.

BCA- 601:   COMPUTER NETWORKS

UNIT: 1
Introduction : Uses of networks (goals and applications), OSI reference model, and its Evolution, TCP/IP model, Example Network- Novell Netware, ARPANET, NSFNET, The Internet, Different type of networks, LAN, MAN, WAN Topologies used in the Networks.

UNIT: 2
The Physical Layer: Transmission media, twisted pair, Base band and Broadband coaxial cable, Fiber optics, unguided media. MODEM, ISDN services, Switching Message, Packet Circuit switching TDM, and FDM.

UNIT: 3
The Data Link Layer: Basic function of the data Link Layer, Framing, Error control, Flow control, Error detection and Correction, Protocols: Simplex Stop and wait protocols, One bit sliding window protocol, Using Go-Back N. Example: the Data Link Layer in the Internet.

UNIT: 4
The Medium Access Sub Layer : Framing, Static and Dynamic Channel Allocation in LANs and MANs, IEEE Standard 802.3, and Ethernet IEEE standard 802.4 and token Ring, IEEE Standard 802.5, Token Bus, Bridges : Bridges from 802.x to 802.y, transport bridges, Source Routing Bridges, Gateways, Routers, ISDN, ATM, X.25.

UNIT: 5
The Network Layer : Network layer design issue, shortest path routing, Flooding, Flow-based routing, Broadcast routing, Congestion control and prevention policies; Internet working connectionless internetworking, tunneling Internet work, Routing, Fragmentation, Firewall, IP address, Internet Controls Protocols.

SUGGESTED READINGS

1. Tanenbaum, A.S. "Computer Networks," PHI, 1990.

2. Stallings, W: Data and Computer Communication, Prentice Hall of India.

3. Fororuzan "Data Communication and Networking" TMH.

BCA-602:　　　　　　ADVANCED INTERNET PROGRAMMING

UNIT: 1

JAVA BASICS REVIEW

Internet, Networking, Event handling, Multithreading, Byte code Interpretation, Customizing application, Collection classes.

UNIT: 2

JavaScript: Introduction, Statements, Functions, objects in Java Script, Events and Event Handling, Arrays, FORMS, Buttons, Checkboxes, Text fields and Text areas.

UNIT: 3

JDBC

Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update; Types of Statement objects (Statement, PreparedStatement and CallableStatement); ResultSet, ResultsetMetaData; Inserting and updating records.

UNIT: 4

Servlets

How to configure TOMCAT; directory structure for a web Application; Servlet API Overview; Writing and running Simple Servlet. Servlet Life Cycle, GenericServlet and HttpServlet, ServletConfig & ServletContext; Writing Servlet to Handle Get and Post Methods, Reading user request data; Writing thread safe Servlets, Http Tunneling, Concept of cookie, Reading and writing cookies; Need of Session Management. Types of Session management; Using HttpSession Object ; Servlet & JDBC

UNIT: 5

JSP

Why JSP? JSP Directives, writing simple JSP page; Scripting Elements; JSP Actions: JSP & Java Beans; JSP Actions: include, forword and plugin, Managing sessions using JSP; JSP & Databases

UNIT: 6

DISTRIBUTED COMPUTING, JAVA BEANS AND SWING

Introduction of RMI & Architecture (No programming is expected), Introduction to Java Bean, Rules for writing a Simple Bean, Bean concepts - Events in bean box.

SUGGESTED READINGS:-

1. Deitel & Deitel , "Java How to program" , Prentice Hall , 4 th Edition, 2000.
2. Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.
3. Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.
4. Core Java Volume-I, Horstman and Cornell, Pearson Education
5. Core Java Volume-II, Horstman and Cornell, Pearson Education
6. Inside Servlets – Dustin R. Callway- Pearson Education

BCA-603:   MANAGEMENT INFORMATION SYSTEM

UNIT: 1
Foundation of Information Systems: Introduction to information system in business, fundamentals of information systems, solving business problems with information systems, Types of information systems, effectiveness and efficiency criteria in information system.

UNIT: 2
An Overview of Management Information Systems:
Definition of a management information system, MIS versus Data Processing, MIS & Decision Support Systems, MIS & Information Resources Management, End user computing, Concept of a MIS, Structure of a Management information system.

UNIT: 3
Concept of planning & Control:
Concept of organizational planning, The Planning Process, Computational support for planning, Characteristics of control process, The nature of control in an organization.

UNIT: 4
Business applications of information technology:
Internet & electronic commerce, Intranet, Extranet & Enterprise Solutions, Information System for Business Operations, Information System for Managerial Decision Support, Information System for Strategic Advantage.

UNIT: 5
Managing Information Technology:
Enterprise & global management, Security & Ethical challenges, Planning & Implementing changes.

UNIT: 6
Advanced Concepts in Information Systems:
Enterprise Resource Planning, Supply Chain Management, Customer Relationship Management and Procurement Management,

SUGGESTED READINGS:

1. O Brian, "Management Information System", TMH.

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

3. Murdick, "Information System for Modern Management", PHI.

4. Jawadekar, "Management Information System," TMH.