COURSE STRUCTURE, SYLLABUS AND SCHEME OF EXAMINATION

FOR

BACHELOR OF COMPUTER APPLICATION

(BCA)

2014-15 Onwards

Department of Computer Applications

VBS PURVANCHAL UNIVERSITY, JAUNPUR

DEPARTMENT OF COMPUTER APPLICATIONS
VBS PURVANCHAL UNIVERSITY, JAUNPUR

STUDY & EVALUATION SCHEME

BCA (Bachelor of Computer Applications)
Effective from session: 2014-2015

SEMESTER I

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-101	PC SOFTWARE	3	1	0	10/20/70	100
BCA-102	COMPUTER ORGANIZATION	3	1	0	10/20/70	100
BCA-103	PROGRAMMING PRINCIPLES & C LANGUAGE	3	1	0	10/20/70	100
BCA-104	FUNDAMENTAL OF IT	3	1	0	10/20/70	100
BCA- L11	PC SOFTWARE LAB	0	0	3	30/70	100
BCA- L12	PROGRAMMING IN C LAB	0	0	3	30/70	100
					TOTAL	600

SEMESTER II

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-201	OBJECT MODELING & C++ PROGRAMMING	3	1	0	10/20/70	100
BCA-202	SYSTEM ANALYSIS AND DESIGN	3	1	0	10/20/70	100
BCA-203	DATA AND FILE STRUCTURE USING C &C++	3	1	0	10/20/70	100
BCA-204	DISCRETE MATHEMATICS	3	1	0	10/20/70	100
BCA-L21	C++ LAB	0	0	3	30/70	100
BCA-L22	DS LAB	0	0	3	30/70	100
					TOTAL	600

DEPARTMENT OF COMPUTER APPLICATIONS

VBS PURVANCHAL UNIVERSITY, JAUNPUR

STUDY & EVALUATION SCHEME

BCA (Bachelor of Computer Applications)
Effective from session: 2015-2016

SEMESTER III

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-301	COMPUTER BASED NUMERICAL & STATISTICAL TECHNIQUES	3	1	0	10/20/75	100
BCA-302	SOFTWARE ENGINEERING	3	1	0	10/20/70	100
BCA-303	PRINCIPLES OF OPERATING SYSTEM	3	1	0	10/20/70	100
BCA-304	JAVA PROGRAMMING	3	1	0	10/20/70	100
BCA-L31	CBNST LAB	0	0	3	30/70	100
BCA-L32	JAVA LAB	0	0	3	30/70	100
					TOTAL	600

SEMESTER IV

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-401	DESIGN & ANALYSIS OF ALGORITHM	3	1	0	10/20/70	100
BCA-402	DATA BASE MANAGEMENT SYSTEM	3	1	0	10/20/70	100
BCA-403	OPTIMIZATION TECHNIQUES	3	1	0	10/20/70	100
BCA-404	COMPUTER GRAPHICS & ANIMATION	3	1	0	10/20/70	100
BCA-L41	DBMS LAB	0	0	3	30/70	100
BCA-L42	GRAPHICS LAB	0	0	3	30/70	100
					TOTAL	600

DEPARTMENT OF COMPUTER APPLICATIONS
VBS PURVANCHAL UNIVERSITY, JAUNPUR

STUDY & EVALUATION SCHEME

BCA (Bachelor of Computer Applications)
Effective from session: 2016-2017

SEMESTER V

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-501	WEB DESIGN	3	1	0	10/20/70	100
BCA-502	DATA MINING	3	1	0	10/20/70	100
BCA-503	.NET FRAMEWORK AND C#	3	1	0	10/20/70	100
BCA-P51	BCA PROJECT - I			3	100	100
BCA-L52	WEB DESIGN LAB	0	0	3	30/70	100
BCA-L53	.NET LAB	0	0	3	30/70	100
					TOTAL	600

SEMESTER VI

SUB CODE	SUBJECT	L	T	P	TA/CT/ESE	TOTAL
BCA-601	DATA COMMUNICATION & COMPUTER NETWORKS	3	1	0	10/20/70	100
BCA-602	E-COMMERCE	3	1	0	10/20/70	100
BCA-603	MULTIMEDIA SYSTEM	3	1	0	10/20/70	100
BCA-P61	BCA PROJECT - II				200	200
BCA-P62	COMPREHENSIVE VIVA				100	100
					TOTAL	600

SEMESTER I

PC SOFTWARE
BCA 101

Unit-I

Introduction:

Definition of a PC and its components, Concept of software, Hardware and firmware, Types of software, Difference between a program and software.

Unit-II

MS DOS:

Basic Operating system concept, CUI, Concept of files and directories, Booting of the system, Internal and External DOS commands, Partition of disk, Limitation of DOS.

Unit – III

MS Windows:

Basic multiprogramming concept, GUI, Folders, Concept of login and logout, My Document, My Computer, My Network, Recycle Bin, Start Button, Task Bar, Date and Time setting, Calculator, WordPad, System tools.

Unit – IV

MS-Office:

MS World: Opening, Creating, Saving a document, Editing, Finding and Replacing Texts, Using the Interface (Toolbars and Menus)

MS Excel: Concept of Workbook, Opening, Creating, Saving a workbook and organization of worksheets in a workbook, Data entry in cell, Selecting/Copying/Moving data in a worksheet.

MS Power Point: Business presentation and their advantages. Opening, Creating, saving a presentation.

Unit – V

Macromedia Flash:

Macromedia products, Basic drawing techniques, Animation techniques, Creating combining interactivity and multiple scenes, Creating transparency effects using text in Flash, Flash animation.

Books:

1. Office 2000
2. Sanjay Saxena : A first course in Computers

SEMESTER I

COMPUTER ORGANIZATION
BCA 102

Unit – I

Number System

Introduction, Binary, Octal & Hexadecimal number system, Conversion form decimal to binary, octal & hexadecimal ect, Representation of numbers in computer and various character codes.

Unit – II

Logic Gates

Boolean algebra, Minterms, Maxrerms, Simplification of Boolean functions, K-Map simplification, Half adder, Full adder, Decoder, Encoder, Multiplexer, Demultiplexer, Binary counters, Flip-Flops.

Unit – III

Memory Organization

RAM, ROM, Auxiliary memory, Memory Hierarchy, Associative memory, Virtual memory, Cache memory, Memory management hardware.

Unit – IV

Input-Output Organization

Peripheral devices, I/O interface, Direct memory access, Type of commands, Modes of transfer, Asynchronous data transfer, Strobe control, Handshaking, DMS transfer, IOP

Unit – V

Processor Organization

Formats, Single Accumulator organization, General register organization, Stack organization, Addressing modes, data transfer and manipulation.

Book:

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

SEMESTER I

PROGRAMMING PRINCIPLES AND C LANGUAGE
BCA 103

Unit – I

Introduction

Algorithm, Flowcharts, Introduction of programming languages, History of C, Basic structure of C Programming, Executing C Program

Data Types

Constant, variables, Identifiers, Keywords, Tokens, Declaration of Variables, Assigning values to variables.

Operators

Arithmetic, Relational, Logical, Assignment, Increment, Decrement operators, Condition, Bit wise operators, Arithmetic expressions.

Unit – II

Branching & Looping

Decision making with if, If-else, Switch Statement, GOTO statement, While loop, Do While loop, FOR Loop, Break and Continue statements.

Array

One dimensional array, Two dimensional array, Multidimensional array, Initializing array.

Unit – III

Function

Function declaration, calling a function, The form of C function, Return values and their type, No arguments, no return value, arguments but no return, recursion, Nesting of function.

Pointers

Accessing address of a variable, declaring and initializing pointers, pointer expression, pointer and array, pointer and function, pointer and structure, pointer to pointer

Unit – IV

Structure & Union

Structure definition, giving values to members, structure initialization, Array of structure, structure within structure, Size of structure, Union definition

Unit – V

File Handling

Defining and opening file, closing a file, I/O operations on file. Random access to file, Error handling in file.

Dynamic memory allocation

Allocating and reallocating memory, allocating memory for structure and array

Books:

1. Programming in C: Gottfried
2. Programming in ANSI C: E. Balaguruswamy
3. Let us C : Y. Kanetkar

SEMESTER I

FUNDAMENTAL OF INFORMATION TECHNOLOGY
BCA 104

Unit – I

Introduction

Definition of an Electronic Digital Computer, characteristics, capabilities and limitation of computer, Generation of computers, Types of computers, Classification of computers on size, Computer Hardware components and their functions, Characteristics and Applications of Computers.

Unit – II

Operating system concepts

Introduction to OS, components of OS, Types of OS, multiprogramming, multitasking & time sharing, File & Directories & their use in different OS, DOS operating system, Window operating system, Unix operating system

Unit – III

Software:

Need, Types of software – System software, Application software, Utility programs, Introduction to programming languages, Assembler, Compiler and Interpreter, Programming languages – Assembly language, Machine level language, High level language. Application software.

Unit – IV

Data Communication & networks:

Types of Network – LAN, MAN, WAN, Internet, Intranet, Topologies of LAN – Ring, Bus, Star, Mesh and Tree.

Unit – V

Tools for Program Development:

Algorithms, Flow charts – symbols, Rules for making flow chart, Types of flow chart, advantage and disadvantage, Pseudo codes, Programming techniques – Top Down, Bottom-up, Modular, Structured.

Books:

1. Computer & Languages: A. Arora & S. Bansal
2. Computer Fundamental: B. Ram
3. Information Technology: D. Cyganski & J.A. Orr
4. fundamentals of information technology: Leon & Leon

SEMESTER II

OBJECT MODELING & C++ PROGRAMMING
BCA 201

Unit – I

Object Modeling: Objects and classes, links and association, generalization and inheritance, aggregation, abstract class, multiple inheritance, meta data, candidate keys, constraints.

Unit – II

Dynamic Modeling: Events and states, operations, nested state diagrams and concurrency, advanced dynamic modeling concepts, a sample dynamic model.

Functional Modeling: Data flow diagram, specifying operations, constraints, a sample functional model. OMT (object modeling techniques) methodologies.

Unit – III

Introduction:

OOP Paradigm, Basic concepts, Benefits and its applications, Basics of C++, Concepts of structure and class, Private and public members, tokens, data types, dynamic initialization, reference variable, operators, dynamic memory allocation, manipulators, control structure.

Functions in C++:

Introduction, main() function, prototyping, call and return by reference, inline function, default arguments, function overloading, friend functions, private member functions, various storage classes, static member functions.

Unit – IV

Constructor and Destructor:

Introduction, parameterized constructors, multiple constructors in a class, constructors with default arguments, dynamic initialization of objects, copy constructor, destructors.

Operator Overloading:

Introduction, definition, method of overloading, Overloading unary and binary operators, manipulation of strings using operators, rules for overloading oprators.

Unit – V

Inheritance:

Definition, base and derived classes, type of inhreitence and their implementation, virtual base classes, abstract class.

Dynamic Polymorphism:

Introduction, pointers to object, this pointer, pointers to derived class, virtual functions, pure virtual functions.

Books:

1. Object oriented programming with C++: Balaguruswamy
2. Object oriented programming: Budd
3. Object oriented programming with C++: R. Lafore

SEMESTER II

SYSTEM ANALYSIS AND DESIGN
BCA 202

UNIT-I

System Concept: Definition, Characteristics, Elements of system, Physical and abstract system, open and closed system, man-made information systems.

System Development Life Cycle: Various phases of system development, Considerations for system planning and control for system success.

System Planning: Base for planning a system, Dimensions of Planning.

UNIT-II

Initial Investigation: Determining users requirements and analysis, fact finding process and techniques.

Feasibility study: Determination of feasibility study, Technical, Operational & Economic Feasibilities, System performance constraints, and identification of system objectives, feasibility report.

Cost/Benefit Analysis: Data analysis, cost and benefit analysis of a new system. Categories determination and system proposal.

UNIT-III

Tools of structured Analysis: Logical and Physical models, context, diagram, data dictionary, data diagram, form driven methodology, IPO and HIPO charts, Gantt charts, system model, pseudo codes, Flow charts- system flow chart, run flow charts etc., decision tree, decision tables, data validation, Input/ Output and **Form Design**: Input and output form design methodologies, menu, screen design, layout consideration.

UNIT-IV

Management standards – Systems analysis standards, Programming standards, Operating standards.

Documentation standards – User Manual, system development manual, programming manual, programming specifications, operator manual. System **testing & quality**: System testing and quality assurance, steps in system implementation and software maintenance.

UNIT-V

Organization of EDP: Introduction. Job Responsibilities & duties of EDP Personnel's- EDP manager, System Analyst, Programmers, Operators etc. Essential features in EDP Organization. Selection of Data Processing Resources: purchase, lease, rent-advantages and disadvantages.

Hardware and software procurement – In-house purchase v/s hiring and lease.

Books:

1. System Analysis & Design by V K Jain, Dreamtech Press
2. Modern System Analysis &Design by A Hoffer, F George, S Valaciah Low Priced Edn. Pearson Education.

SEMESTER II

DATA & FILE STRUCTURE USING 'C'
BCA 203

Unit – I

Introduction

Basic Technology, Elementary data organization, Data structure operations, Algorithm Complexity.

Unit – II

Array:

Array Definition, Representation and analysis, Single and Multidimensional arrays, Address calculation, Application arrays, Character string in C, Character string operation, Array as parameters, Ordered list, sparse matrix and vectors.

Unit – III

Stack and Queue and Link List:

Static & Dynamic data structure, definition, concepts, algorithms and application of stack & queues, linked stack & queue, linked list operation, doubly linked list.

Unit – IV

Tree and Graph:

Definition & concept of tree, binary tree, conversion of general tree to binary tree, tree-traversal, rotation of tree, balanced tree, graphs, traversal, connected components & spanning tree, shortest path & transitive closure.

Unit – V

Searching & sorting

Sequential search, binary search, searching algorithms & their analysis, insertion sort, selection sort, analysis of sorting algorithms, lower bounds, merge sort of linked list, quick short.

File Structure:

External storage device, Files, Sequential organization, random organization, linked organization, inverted file, Indexing techniques.

Books:

- E. Horowitz & Sahini, "Data Structure", Galgotia
- Tenebaum, "Data Structure & program design in C" PHI
- Lipschutz, "Data Structure" TMH

SEMESTER II

DISCRETE MATHEMATICS
BCA 204

Unit – I

Set Relation And Function :

Sets & subsets,set operation, power set, cartesion product of two sets composition of relation, type of relation, mapping,mathematical function, exponential & logarithmic functions.

Group & fields:

Group, sub group, Finite & infinite group, cyclic group, permutation group, homomorphism, isomorphism, automorphism, endomorphism, coset, Field, sub field & Ring.

Unit – II

Mathematical Logic:

Statement & Notations, connectives, Normal forms, Theory of inference for the statement calculus, Predicate calculus.

Unit – III

Basic concept of Graph:

Basics of Graph, Pseudograph, Multigraph, Simple graph, Bipartite graph and Complete Bipartite graph, Hand Shaking Lemma, Sub graphs, Operations on graph, Walk, Path and Circuits and their properties. Shortest Path Problem.

Unit - IV

Eulerian and Hamiltonian Graph:

Unicursal and Eulerian graph, Randomly Eulerian graph, Fleury's Algorithm, Chinese Postman Problem, Hamiltonian Graph, Necessary and Sufficient conditions, Traveling Salesman Problem.

Unit – V

Trees and Spanning Trees:

Tree, Properties of tree, Distance, Radius, Diameter of a tree, Spanning tree, Fundamental Circuit, Cayley's Formula for number of spanning tree, Minimal spanning tree : Kruskal's and Prim's Algorithm, Connectivity and Seperability**.**

Network Flow:

Networks: Flows, Cuts in a Network, Max-flow Min-cut theory, Augmenting path, Ford and Fulkerson algorithm, Edonds and Karp algorithm, Menger's Theorems.

Books:

1. Elements of Discrete Mathematics: C.L. Liu
2. S. Pal, "Graph Theory and its Applications", Umesh Pub., Delhi

SEMESTER III

COMPUTER BASED NUMERICAL AND STATISTICAL TECHNIQUES
BCA 301

Unit – I

Floating Point Arithmetic:

Representation of floating point number, Operations, Normalization, Pitfalls of floating point representation, Error in numerical computation.

Iterative Methods:

Bisection methods, Regula-Falsi method, Newton-Raphson method.

Unit – II

Simultaneous Linear Equations:

Solution of systems of linear equations, Gauss elimination direct method and Pivoting, Ill conditioned system of equations, Refinement of solution, Gauss Seidal method.

Unit – III

Interpolation and approximation:

Finite differences, Difference tables, Polynomial Interpolation: Newton forward and backward formula. Central Difference formula: Gauss forward and backward formula.

Interpolation with unequal intervals:

Langrange's interpolation, Newton Divided difference formula.

Unit – IV

Statistics:

Statistics and its role in decision making, Internal and external source of data, Formation of frequency distribution and types of frequency distribution, Simple and weighted mean, median and mode.

Unit – V

Correlation:

Significance of study of Correlation, Types of Correlation: Positive and Negative correlation, Simple, Partial and Multiple Correlation, Linear and Non-linear correlation, Coefficient of Correlation, Use of Regression analysis, Difference between correlation and regression analysis, Regression Lines: Regression equation of Y on X and X on Y.

Books:

- Rajaraman, "Computer Oriented Numerical Methods", PHI
- Gerald and Wheatly, "Applied numerical Analysis", AW.
- Pradip Niyogi, "Numerical Analysis and algorithms", TMH.

SEMESTER III

SOFTWARE ENGINEERING
BCA 302

Unit – I

Introduction

Introduction to Software Engineering, Importance of Software, The feauters of software, Software development life-cycle.

Unit – II

Software requirement specification:

Software process, Water Fall Model, Incremental Model, Prototyping Spiral Model, Role of Management in Software development, Role of matrices and measurement, Problem analysis, Requirement specification, Monitoring and Control.

Unit – III

Software Design:

Design principles, Problem partitioning, Abstraction, Top-down and Bottom-up design, Structured approach, Functional versus Object oriented approach, Design specification and Verification, Monitoring and Control, Cohesiveness, Coupling, Forth generation techniques, Functional independence, Software architecture.

Unit – IV

Coding:

Top-down and Bottom-up programming, Structured programming, Information hiding, Programming style and internal documentation.

Testing: Testing principles, Levels of testing, Functional testing, Structural testing, Test plane, Test case specification, Reliability assessment, Software testing strategies, Verification and validation, Uni**t** testing, Integration testing, Alpha and Beta testing, system testing and debugging.

Unit – V

Software Project Management:

The Management spectrum – (The people, The product, the process, the project), Cost estimation, project scheduling, Staffing, Software Configuration management, Structured Vs Unstructured maintenance.

Book:

- Pressman, “Software Engineering: A practitioner’s approach”, TMH
- Pankaj Jalote, “ Software Engineering”, Narosa
- Ghezzi, Carlo and Others, “Fundamental of Software Engineering”, PHI.

SEMESTER III

PRINCIPALS OF OPERATING SYSTEM
BCA 303

Unit – I

Introduction

Operating system and functions, evaluation of operating system, batch, interactive, time-sharing & real time systems, System protection, system components, system structure, operating system services.

Unit – II

Concurrent process

Process, state transition, interrupts, process control block, principle of concurrency, producer-consumer problem, critical section,

Unit – III

CPU scheduling

Scheduling concept, performance criteria, scheduling algorithms such as FCFS, SJF, Round-Robin.

Deadlock

System model, deadlock characterization, prevention.

Unit – IV

Memory Management

Real storage, resident monitor, multiprogramming with fixed partition, multiprogramming with variable partition, multiple base register, paging, segmentation, paged segmentation, virtual memory concept, demand paging, page replacement algorithms, allocation of frames, thrashing, cache memory organization, impact on performance

Unit – V

UNIX/LINUX

Unix system kernel & Utilities, File & Directories, Single & compound statement, basic commands, Bourn shell, korn shell & C shell, shell meta characteristics, shell variables & scripts, environment, integer arithmetic & string manipulation, decision making.

Books:

1. Operating system : Paterson
2. Operating system: Andrew S. Tannebaum
3. Operating System: W. Stalling

SEMESTER III

JAVA PROGRAMMING
BCA 304

Unit – I

Introduction to Java: Importance and features of java, keywords, constants, variables and data types, Operators and expressions, Decision making, branching and looping: if.. else, switch, ?: operator, while, do, for statements, labeled loops, jump statements : break, continue, return.
Introducing classes, objects and methods: defining a class, adding variables and methods, creating objects, constructors, class inheritance.

Unit – II

Arrays and strings: creating an array, one and two dimensional arrays, string array and methods, String and String Buffer classes, Wrapper classes.
Inheritance : Basics types, using super, Multilevel hierarchy abstract and final classes, Object class, Packages and interfaces, Access protection, Extending Interfaces, packages.

Unit – III

Exception Handling: Fundamentals exception types, uncaught exceptions, throw, throw, final, built in exception, creating your own exceptions.
Multithreaded Programming: Fundamentals, Java thread model: priorities, synchronization, messaging, thread class, Runnable interface, interthread Communication, suspending, resuming and stopping threads.

Unit – IV

Input/Output: Basics, Streams, Byte and Character stream, predefined streams, Reading and writing from console and files. Using Standard Java Packages (lang, util, io, net).
Networking: Basics, networking classes and interfaces, using java.net package, doing TCP/IP and Datagram Programming.

Unit – V

Event Handling: Different mechanism, the Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter and Inner Classes, Working with windows, graphics and text, using AWT controls, Layout managers and menus, handling Image, animation, sound and
video, Java Applet.

Books:

1. James Rumbaugh etal, “Object Oriented Modeling and Design”, PHI
2. Herbert Schieldt, “The Complete Reference: Java”, TMH.
3. E. Balagurusamy, “Programming in JAVA”, TMH.

SEMESTER IV

DESIGN & ANALYSIS OF ALGORITHM
BCA 401

Unit – I

Introduction:

Algorithm, Analysis of algorithm, Designing Algorithm, Mathematical Foundations, Growth of functions, Summation, Recurrence, Sets, Counting & Probability.

Unit – II

Divide & Conquer:

Searching: Binary search, Sorting: Counting Sort, Radix Sort, Bucket Sort, Selection Sort, Heap Sort, Merge sort, Quick sort, Greedy Methods – Minimum spanning tree, Dijkastra's Algorithm for shortest paths from a single source, Fractional Knapsack problem, Optimal storage on tapes.

Unit – III

Dynamic Programming:

0-1 Knapsack problem, Matrix chain multiplication problem, Optimal binary search tree.

Unit – IV

Back Tracking:

8 Queen Problem, Chromatic number, Graph coloring, Coloring of tree.

Unit – V

Branch & Bound

Traveling salesman problem

Books:

1. Introduction to Algorithms: Cormen, Leiserson, Rivest
2. Fundamental of Computer Algorithms: Horowitz & Sahani

SEMESTER IV

DATABASE MANAGEMENT SYSTEM

BCA 402

Unit- I

Introduction:

An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

Unit- II

Data Modeling using the Entity Relationship Model:

ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model.

Unit- III

Relational data Model and Language: Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra.

Unit- IV

Introduction to SQL: Characteristics of SQL. Advantage of SQL. SQL data types and literals. Types of SQL commands. SQL operators and their procedure. Tables, Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus.

Unit- V

Data Base Design & Normalization:

Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions.

Modern Trends in Database Management:

Introduction to Internet Database, Geographical Databases, Data Mining, Data Warehousing.

Text Books

1 Date C J, “An Introduction To Database System”, Addision Wesley
2 Korth, Silbertz, Sudarshan, “Database Concepts”, McGraw Hill
3 Elmasri, Navathe, “Fundamentals Of Database Systems”, Addision Wesley
4 Leon & Leon, “Database Management System”, Vikas Publishing House.

SEMESTER IV

OPTIMIZATION TECHNIQUES

BCA 403

Unit – I

Linear Programming:

Definition of LPP, Graphical Solution of two variable LPP, General LPP Problem, Canonical and Standard forms of LPP, Simplex Methods and artificial variable, Sensitivity Analysis, Problem of Degenracy & Concept of Duality.

Unit – II

Transportation Problems:

Introduction to Transportation model, Matrix form of TP, Application of TP model, Assignment Problems, Mathematical Formulation, Finding I.B.F.S., Optimality Tests, Degeneracy, Unbalanced Transportation Problems.

Unit – III

Sequencing Models and Related Problems:

Sequencing Problem, Processing n Jobs through two machine, Processing n Jobs through three machine, Processing 2 Jobs through m machine, Processing n Jobs through m machine, Traveling Salesman problem.

Unit – IV

PERT & CPM:

Min-Max Flows, PERT, CPM, Network and Basic Components, Problem Solving using PERT & CPM.

Unit – V

Dynamic Programming:

Bellman's principle of optimality of dynamic programming, Multistage decision problem and its solution by dynamic programming, Recursive Equation Approach, D.P Algorithm, Solution of Disurete D.P.P, Solution of L.P.P by D.P.P.

Books:

1. Operation Research: Kantiswaroop
2. Operation Research – An Introduction : Taha

SEMESTER IV

COMPUTER GRAPHICS & ANIMATION
BCA 404

UNIT –I

Graphics Primitives:

Display Devices: Refresh Cathode Ray Tube, Raster Scan Display, Plasma display, Liquid Crystal display, Plotters, Printers. Input Devices: Keyboard, Trackball, Joystick, Mouse, Light Pen, Tablet, and Digitizing Camera.

UNIT-II

Mathematics for Computer Graphics:

Point representation, Vector representation, Matrices and operations related to matrices, Vector addition and vector multiplication, Scalar product of two vectors, Vector product of two vectors.

Line Drawing Algorithms:

DDA Algorithms, Bresenharm's Algorithms.

Polygons:

Polygons representation, entering polygons, filling polygons

UNIT-III

Transformations

Translation, Scaling, Rotation, Reflection, Metrics transformation, Transformation, routines, Composite Transformation.

UNIT-IV

Segments

Segments table, creating, deleting & renaming a segments visibility, image transformation

UNIT-V

Animation : Introduction to Animation, Principles of Animation, Types of Animation, Types of Animation Systems : Scripting, Procedural, Representational, Stochastic, etc.

Animation Tools : Hardware –SGI, PC's, Amiga etc.

Software : Adobe Photoshop, Animation studio, Wave front etc.

Books

- Rogers "Procedural Element of Computer Graphics " TMH
- Harrington's "computer Graphics A programming Approach Ii Edition

SEMESTER V

WEB DESIGN
BCA 501

Unit – I

Overview of Internet:

Introduction to Internet and WWW, Internet protocols like TCP/IP, http, telnet and ftp, url, email, domain name, Web Browsers, Search Engines, Counters, Chat & Bulletin Board Services.

Unit – II

Principles of Web Design: Key issues to be considered in web site design.

Structure of a Web Page:

Introduction to HTML, Elements of HTML syntax, Head and Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and Color Control, ordered and unordered lists, content layout & presentation.

HTML Tags: Use of Different HTML tags in web pages.

Table Handling : Table layout & presentation, constructing tables in a web page, developing a web page in a table.

Unit – III

HTML Editors & Tools: Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc.

Graphical and Animation Techniques: Use of Different graphical and animation tools like Abode Photoshop, Gif Animator etc.

Unit – IV

Interactivity: Client Server Model, Static & Dynamic Web pages, Creating forms, CGI, Role of Databases in web applications.

Unit – V

Web Technologies:

Overview of various web technologies and their applications like Java Script, active server pages, Macromedia flash, embedding java applets in a web page etc.

Books:

1. C. Xavier, “World Wide Web Design with HTML”, Tata McGraw Hill.
2. Joel Sklar, “Principles of Web Design”, Web Warrior series.
3. Rick Dranell, “HTML4 unleashed”, Techmedia Publication.
4. Shelly Powers, “Dynamic Web Publishing Unleashed”, Techmedia.
5. Don Gosselin, “JavaScript”, Vikas Publication
6. Mark Swank & Drew Kittel, “World Wide Web Database”, Sams net.

SEMESTER V

DATA MINING
BCA 502

UNIT-I

Introduction - What is Data mining , Data mining - important Data mining - various kind of data Data mining Functionalities – Various kinds of Patterns Pattern Interesting Classification of Data mining Systems Data mining Task Primitives Integration of Data Mining System Major issues in Data Mining.

UNIT-II

Data Processing - Process the Data Descriptive Data Summarization – Measuring Central Tendency Dispersion of Data Graphic Displays of –Basic Descriptive Data Summaries Data Cleaning Data Integration and Transformation data Reduction Data Discrimination - Concept Hierarchy Generation

UNIT-III

Data Warehouse OLAP Technology An overview - Data Warehouse Multidimensional Data Model Data Warehouse Architecture Data Warehouse Implementation From Data Warehouse to Data mining

UNIT-IV

Mining – Frequent Patterns Associations Correlations - Basic Concepts Road Map Efficient Scalable Frequent Item set Mining methods Mining – Various Kinds of Association rules Analysis - Association mining to Correlation Constrain Based Association mining

UNIT-V

Applications Trends - Data mining Applications Data mining – System Products Research Prototype Additional Themes on Data Mining Social impact of Data mining Trends in Data mining.

Book :

- Data Mining (Concepts and Techniques), Author : Jiawei Han and Micheline Kamber Publishers : Morgan Kaufmann Publishers (An imprint of Elsevier)
-

SEMESTER V

.NET FRAMEWORK AND C#
BCA 503

Unit – I

The .Net Framework:

Introduction, Common language, Run-time, Common type system, Common language specification, The base class library, The .Net class library intermediate language, Just-in-time compilation, Garbage collection

Unit – II

C# Basics:

Introduction, Data types, Identifiers, Variables and Constants, C# statements, Object oriented concept, Object and classes, Array and Strings,

Unit – III

C# Using Libraries:

Namespace systems, 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, Window 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.

Book:

- Shibi Panikkar and Kumar Sanjeev, “C# with .Net Framework”, Firewall Media.
- Shildt, “C#: The Complete Reference”, TMH
- Fergal Grimes, “Microsoft .Net for Programmers”, SPD.

SEMESTER VI

DATA COMMUNICATION & COMPUTER NETWORKS

BCA 601

Unit – I

Digital Communication:

Fundamentals of Digital Communication, Communication Channel, Transmitter, Channel Noise, Amplitude modulation, Frequency modulation, Sampling pulse modulation, PCM.

Base Band Data Transmission:

Synchronization and Scrambler and unscramble, Band pass data transmission system ASK, PSK, DPSK, MSK, Modulation.

Registrars

Unit – II

Introduction:

Uses of Computer Networks, Network Architecture, Reference Model (ISO-OSI, TCP/IPOverview, IP Address Classes, Subneting), Domain Name Registration &

Physical Layer:

Theoretical basis for data communication, transmission media-Magnetic Media, Twisted Pair, Baseband Coaxial Cable, Broadband Coaxial Cable, Fibre Cable, Structured Cabling, Cable Mounting, Cable Testing, Wireless transmission, the telephone system, narrowband ISDN, broadband ISDN and ATM.

Unit – III

Data Link Layer:

Data link layer design issues, error detection and correction, data link protocols, sliding window protocols, Examples of Data Link Protocols.

Unit – IV

The Medium Access Sub layer:

The channel allocation problem, multiple access protocols, IEEE standard 802 for LANS and MANS, high-speed LANs, satellite networks, Network devices-repeaters, hubs, switches and bridges.

Unit - V

Network Layer:

Network layer design issues, routing algorithms, congestion control algorithm, internetworking, the network layer in the internet, the network layer in ATM networks.

Books:

1. Tananbaum A.S., “Computer Networks”, 3rd Ed, PHI, 1999.
2. Black U., “Computer Networks-Protocols, Standards and Interfaces”, PHI, 1996.
3. Stallings W., “Computer Communication Networks”, PHI.
4. Laura Chappell (ed), “Introduction to Cisco Router Configuration”, Techmedia, 1999.
5. Michael A. Miller, “Data & Network Communication”, Vikas Publication

SEMESTER VI

E-COMMERCE
BCA 602

Unit – I

Introduction:

Electronic Commerce – Technology& Prospects, Definition of E-Commerce, Electronic potential of E-Commerce, Forces behind E-Commerce, Advantages and disadvantages of E-Commerce.

Unit – II

Mobile Commerce:

Introduction, Wireless application protocol, WAP technology, Mobile information device, Mobile computing Applications.

Unit – III

Web Security:

Security issue on web, Firewall, Components of Firewall, Security threats, Network security, Limitation of firewall.

Unit – IV

Encryption:

Encryption techniques, Symmetric Encryption keys and data Encryption standards, Triple Encryption, Asymmetric Encryption – Secret key Encryption, Public and Private key Encryption.

Unit – V

Electronic Payment:

Overview, Payment gateway, Certificate, Digital tokens, Smart card, Credit card, Magnetic strip card, E-checks, On line banking.

Books:

1. Ravi Kalakota: Frontieres of Electronic Commerce
2. Bajaj & Negi: E-Commerce the cutting edge of Business

SEMESTER VI

MULTIMEDIA SYSTEMS
BCA 603

Unit - I

Evolution of Multimedia and its objects, Scope of multimedia in business & work, Production and Planning of Multimedia applications, Multimedia hardware, Memory and storage Devices, Communication Devices, Multimedia Software,

Unit – II

Production and Planning of Multimedia building blocks, Text Sound (MIDI), Digital Audio, Audio file formats, MIDI under Windows environment, Audio and Video Capture.

Unit – III

Macromedia products, Basic drawing techniques, Advance animation techniques, Creating multi layer combining interactivity and multiple scenes.

Unit – IV

Digital Audio concept, Sampling Variables, Loss Less compression of sound, Lossy compression & Silence compression.

Unit – V

Multimedia monitor bitmaps, Vector drawing, Lossy graphic compression, Image file formatic animations Image Standards, JPEG compression, Zig Zag coding, Video representation, colors, video compression, MPEG standards, recent development in Multimedia.

Book:

- Tay Vaughan, “Multimedia Making it Work”, Addison Wesley
- Andreas Halzinger, “Multimedia Basics”, Firewell Media
- Agrawal & Tiwari, “Multimedia Systems”, Excel
- Sleinreitz, “Multimedia Systems”, Addison Wesley