

COURSE STRUCTURE, SYLLABUS AND SCHEME OF EXAMINATION

FOR

**BACHELOR OF COMPUTER APPLICATION
(BCA)**



**Department of Computer Applications
MSDSU, Azamgarh**

Semester-wise Titles of the Papers in BCA

| Year | Sem | Course Code | Paper Title | Theory/Practical | Credit |
|------|-----|-------------|--|------------------|--------|
| 1 | I | | IT TOOLS AND APPLICATION | Theory | 04 |
| | | | COMPUTER ORGANIZATION | Theory | 04 |
| | | | PC SOFTWARE LAB | Practical | 04 |
| | II | | PROGRAMMING PRINCIPLES & C LANGUAGE | Theory | 04 |
| | | | DISCRETE MATHEMATICS | Theory | 04 |
| | | | PROGRAMMING IN C LAB | Practical | 04 |
| 2 | III | | PRINCIPLES OF OPERATING SYSTEM | Theory | 04 |
| | | | JAVA PROGRAMMING | Theory | 04 |
| | | | JAVA LAB | Practical | 04 |
| | IV | | SOFTWARE ENGINEERING | Theory | 04 |
| | | | DATA BASE MANAGEMENT SYSTEM | Theory | 04 |
| | | | DBMS LAB | Practical | 04 |
| 3 | V | | DESIGN & ANALYSIS OF ALGORITHM | Theory | 04 |
| | | | DATA MINING | Theory | 04 |
| | | | PROGRAMMING AND PROBLEM SOLVING THROUGH PYTHON | Theory | 04 |
| | | | PYTHON LAB | Practical | 04 |
| | VI | | DATA COMMUNICATION & COMPUTER NETWORKS | Theory | 04 |
| | | | DATA AND FILE STRUCTURE | Theory | 04 |
| | | | WEB DESIGN | Theory | 04 |
| | | | WEB DESIGN LAB | Practical | 04 |

Evaluation of Internship And Research Project

| Year | Sem | Course Code | Paper Title | Credit |
|------|-----|-------------|------------------|--------|
| 2 | IV | | INTERNSHIP | 03 |
| 3 | V | | BCA PROJECT - I | 04 |
| | VI | | BCA PROJECT - II | 04 |

Minor Multidisciplinary Subject

| Year | Sem | Course Code | Paper Title | Theory/Practical | Credit |
|------|-----|-------------|------------------------------------|------------------|--------|
| 1 | II | | CONCEPT OF ARTIFICIAL INTELLIGENCE | Theory | 06 |
| 2 | IV | | CYBER SECURITY | Theory | 06 |

SEMESTER I

IT TOOLS & APPLICATION

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

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

Unit – III

Word Processing:

Word Processing and their usage, details of word processing screen. Opening, saving and printing a document including pdf files. Document creation, formatting of text, paragraph and whole document. Inserting Header and Footer on the document. Finding text on a word document and correcting spellings. Inserting and manipulating tables, enhancing table using borders and shading features, Preparing copies of a document labels etc. for sending various recipients using Mail Merge.

Unit – IV

Spreadsheet:

Basic Knowledge of Spreadsheet Processing, their usage, details of Spreadsheet screen, Opening, saving and printing a Spreadsheet, Spreadsheet creation, inserting and editing data in cells, sorting and filtering of data, Inserting and deleting rows/columns, Applying basic formulas and functions, Preparing chart to represent the information in a pictorial form.

Unit – V

Presentation :

Basic Knowledge of presentations, Opening/saving a presentation and printing of slides and handouts, Manipulating slides to enhance the look of the slides as well as whole presentation by inserting a picture, objects, multimedia formatting etc. Running a slide show with various transitions.

.Books:

1. Office 2010
2. Sanjay Saxena : A first course in Computers
3. Information Technology: D. Cyganski & J.A. Orr
4. Fundamentals of information technology: Leon & Leon

SEMESTER I

COMPUTER ORGANIZATION

Unit – I

Number System

Introduction, Number System-Decimal, Binary, Octal and Hexadecimal, Conversion of one number system to another, Complements- $(r-1)$'s complement and r 's complement, Representation of numbers in computer and various character codes- BCD, Excess-3, Gray Code, ASCII etc.

Unit – II

Digital Logic Circuits

Logic Gates, Boolean algebra, Simplification of Boolean functions, K-Map simplification. **Combinational Logic Circuits**-Half adder, Full adder, Decoder, Encoder, Multiplexer, Demultiplexer.

Sequential Logic Circuits- Flip-Flops, Characteristic & Excitation tables and State Equation, Binary Counters (synchronous and asynchronous).

Unit – III

Memory Organization

RAM, ROM, Auxiliary memory, Memory Hierarchy, Associative memory, Memory mapping (Direct, Associative, Set associative), Cache memory, Virtual memory, Memory management hardware.

Unit – IV

Input-Output Organization

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

Unit – V

Processor Organization

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

Books:

1. Computer System Architecture, M. Mano(PHI)
2. Structured Computer Organization, Tannenbaum(PHI)
3. Computer Organization, Stallings(PHI)
4. B. Ram, "Computer Fundamental Architectures Organization" (New Age)

SEMESTER II

PROGRAMMING PRINCIPLES AND C LANGUAGE

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 Constructs: if, if-else, nested if, else if ladder, switch statement, goto statement.

Looping statement: while, do...while, for loop. Break and continue statement.

Array: Defining Array, declaration and initialization, One dimensional array, two dimensional array, Multidimensional array, Array and function, passing array to function.

Strings: declaration and initialization, reading and writing, string handling function.

Unit – III

Function

Library and user defined functions, defining a function, calling a function, The form of C function, Return values and their type, No arguments, no return value, arguments but no return, recursive functions, Nesting of function, arrays and functions.

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 a file, closing a file, input and output operations on a file, error handling, random access file.

Dynamic Memory Allocation

Dynamic memory allocation functions: malloc (), calloc (), free (), realloc ().

Books:

1. Programming in C: Gottfried
2. Programming in ANSI C: E. Balaguruswamy
3. Let us C : Y. Kanetkar
4. E. Balagurusamy, 3 rd edition, ANSI C, McGraw-Hill Publication
5. Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall PTR (1988), The C Programming Language, 2nd Edition.

SEMESTER II

DISCRETE MATHEMATICS

Unit-I Set Relation And Function :

Sets & subsets, set operation, power set, cartesian 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 Separability.

Network Flow:

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

Books:

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

PRINCIPLES OF OPERATING SYSTEM

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

Process and Thread Management

Definitions of Process, The Process Model, Process States, Process State Transition, The Process Control Block, interrupts, principle of concurrency

Thread Overview, Multithreading Models.

Process Synchronization Race Condition - Critical section problem, Peterson's Solution, Mutex Locks, Semaphores, Classic Problems of Synchronization- Producer-Consumer problem, Readers-writer problem, Dining Philosopher's problem.

Unit – III

CPU scheduling

Scheduling concept, performance criteria, Scheduling Algorithms - Pre-emptive and Non-Pre-emptive scheduling (Round-Robin, First Come First Served, Shortest-Job- First, Shortest Process Next, Shortest Remaining Time Next)

Deadlock

System Model, Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance.

Unit – IV

Memory Management

Main Memory Swapping- Contiguous Memory Allocation - First Fit, Best Fit, Worst Fit- Segmentation- Paging.

Virtual Memory Demand Paging -Page Fault - FIFO, LRU, OPR Page Replacement Algorithms, -Allocation of Frames –Thrashing

Unit – V

Storage Management

File-System Interface- File Concept, File-System Mounting, Allocation Methods, Disk structure, Disk Scheduling Algorithms

Books:

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

SEMESTER III

JAVA PROGRAMMING

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

SOFTWARE ENGINEERING

Unit-I

Introduction

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

Unit – II

Software requirement specification:

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

Unit – III Software Design:

Design process, Design principles, Problem partitioning, Abstraction, Modularity, Top-down and Bottom-up design, Structured approach, Functional versus Object oriented approach, conceptual model of UML Creating an architectural design: software architecture, Design specification and Verification, Monitoring and Control, Cohesiveness, Coupling, Functional independence.

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, Unit 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, Risk management.

Book:

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

SEMESTER IV

DATABASE MANAGEMENT SYSTEM

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", Addison Wesley
- 2 Korth, Silbertz, Sudarshan, "Database Concepts", McGraw Hill
- 3 Elmasri, Navathe, "Fundamentals Of Database Systems", Addison Wesley
- 4 Leon & Leon, "Database Management System", Vikas Publishing House.

SEMESTER V

DATA MINING

Unit-I

Introduction: Fundamentals of Data Mining, Kinds of Patterns can be mined, Technologies Used, Applications and Issues in Data Mining. **Types of Data:** Attribute types, Basic Statistical descriptions of Data, Measuring data Similarity and Dissimilarity. **Data Preprocessing:** Need of Preprocessing, Data Cleaning, Data Integration, Data Reduction, Data Transformation.

Unit-II

Data Warehouse and OLAP: Data Warehouse, Data Warehouse Modeling, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-oriented induction.

Unit-III

Mining Frequent Patterns, Associations and Correlations: Market Basket Analysis, Association rule mining, Frequent Item set mining methods, Pattern Evaluation methods, Constraint based frequent pattern mining, Mining Multilevel and Multidimensional patterns.

Unit-IV

Classification: General approach to classification, Classification by Decision Tree Induction, Bayes Classification methods, Bayesian Belief Networks, Classification by Back-propagation, Lazy Learners, Other Classification methods, Classification using Frequent patterns, Model Evaluation and selection.

Unit-V

Cluster Analysis: Basic Clustering methods, Partitioning methods, Density –Based Methods, Grid based methods, and Evaluation of Clustering, Outlier Analysis and Detection methods.

Books:

- 1 Han J & Kamber M, “Data Mining: Concepts and Techniques”, Harcourt India, Elsevier India, Second Edition.
- 2 Pang-Ning Tan, Michael Steinback, Vipin Kumar, “Introduction to Data Mining”, Pearson Education, 2008.
3. Margaret H Dunham, S. Sridhar, “Data mining: Introductory and Advanced Topics”, Pearson Education, 2008

SEMESTER V

DESIGN & ANALYSIS OF ALGORITHM

Unit – I

Introduction:

Introduction Algorithm concepts, need for analysis, time and space complexities

Mathematical Foundations: Growth of Functions-Asymptotic notation

, worst, average and best case analysis, amortized analysis, Recurrence relations for analysis of recursive algorithms using Substitution method, Recursion tree method and Masters theorem

Unit – II

Divide & Conquer:

Searching: Binary search, Sorting: Counting Sort, Radix Sort, Bucket Sort, Selection Sort, Heap Sort, Merge sort, Quick sort.

Unit – III

Greedy Methods – Minimum cost spanning tree- The Algorithm of Kruskal's and Prims, Single-source shortest path in a directed graph, Fractional Knapsack problem, Optimal storage on tapes.

Unit – IV

Dynamic Programming:

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

Unit – V

Back Tracking:

Basic strategy, 8-Queen's problem, graph coloring, Chromatic number, coloring of tree.

Branch & Bound

Traveling salesman problem

Books:

1. Introduction to Algorithms: Cormen T.H. et.al: Prentice Hall of India
2. Computer Algorithms: Horowitz, Sahani, Rajasekhara, Galgotia Publications Pvt. Ltd.
3. Fundamentals of Algorithms: Brassard, Bratley, Prentice Hall.

SEMESTER V

PROGRAMING IN PYTHON

UNIT 1

Introduction to Programming

The basic Model of computation, algorithms, flowcharts, Programming Languages, compilation, testing & debugging and documentation.

Algorithms and Flowcharts to Solve Problems

Flow Chart Symbols, Basic algorithms/flowcharts for sequential processing, decision based processing and iterative processing.

UNIT 2

Introduction to Python

Python Introduction, Technical Strength of Python, Introduction to Python Interpreter and program execution, Using Comments, Literals, Constants, Python's Built-in Data types, Numbers (Integers, Floats, Complex Numbers, Real, Sets), Strings (Slicing, Indexing, Concatenation, other operations on Strings), Accepting input from Console, printing statements, Simple 'Python' programs.

Operators, Expressions and Python Statements

Assignment statement, expressions, Arithmetic, Relational, Logical, Bitwise operators and their precedence, Conditional statements: Notion of iterative computation and control flow – range function, Iterative statements. Pass statement, else, assert.

Sequence Data Types

Lists, tuples and dictionary, (Slicing, Indexing, Concatenation, other operations on Sequence datatype), concept of mutability,

UNIT 4

Functions

Top-down approach of problem solving, Modular programming and functions, Function parameters, Local variables, the Return statement, DocStrings, global statement, Default argument values, keyword arguments, VarArgs parameters.

Library function-input(), eval(),print(), String Functions: count(), find(), rfind(), capitalize(), title(), lower(), upper(), swapcase(), islower(), isupper(), istitle(), replace(), strip(), lstrip(), rstrip(), split(), partition(), join(), isspace(), isalpha(), isdigit(), isalnum(), startswith(), endswith(), encode(), decode(), String: Slicing, Membership, Pattern Matching, Numeric Functions: eval(), max(), min(), pow(), round(), int(), random(), ceil(), floor(), sqrt(), Date & Time Functions, Recursion.

File Processing

Concept of Files, File opening in various modes and closing of a file, Reading from a file, Writing onto a file, File functions-open(), close(), read(), readline(), readlines(),write(), writelines(),tell(),seek(), Command Line arguments.

UNIT 5

Scope and Modules

Scope of objects and Names, LEGB Rule Module Basics, Module Files as Namespaces, Import Model, Reloading Modules.

NumPy Basics

Introduction to NumPy, ndarray, datatypes, array attributes, array creation routines, Array From Existing Data, Array From Numerical Ranges, Indexing & Slicing.

17.1. Reference Books/Study Material

1. Python Programming- A modular Approach (with Graphics, database, Mobile and Web Applications by Sheetal Taneja and Naveen Kumar, Pearson.
2. Python Network Programming Cookbook by Pradeeban Kathiravelu, Dr. M. O.Faruque Sarkar, PACKT.
3. Head First Python by Paul Berry, O'Reilly
4. Dive into Python by Mark Pilgrim, APress
5. Beginning Programming with Python Dummies by John Paul Mueller.

SEMESTER VI

DATA COMMUNICATION & COMPUTER NETWORKS

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/IP Overview, IP Address Classes, Subnetting), 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

Data and File Structure

Unit – I

Introduction

Basic Technology, Elementary data organization, Data structure operations, Algorithm complexity (Time and Space complexity) and asymptotic notations.

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, sparse matrix and vectors.

Unit – III

Stack, Queue and Linked List

Static & Dynamic data structure, **Stack & Queue**: Definition, Types, Operation, Array representation, Algorithms, Application of stack: Postfix and Prefix conversions, Evaluation of expressions using stack.

Linked List: Singly Linked List, Traversing and Searching of Linked List, Insertion and deletion operation, Types of linked list, Linked stack and queue.

Unit – IV

Tree and Graph

Definition & concept of tree, Binary tree, Conversion of general tree to binary tree, Tree-traversal, Balanced tree and rotation. **Graphs**: Traversal, Connected components & spanning tree, Shortest path & transitive closure.

Unit – V

Searching and Sorting

Sequential search, Binary search, Searching algorithms & their analysis, Insertion sort, Selection sort, Merge sort and Quick sort, Analysis of sorting algorithms.

File Structure

External storage device, Files, Sequential organization, Random organization, Linked organization, inverted file, Indexing techniques.

Books:

1. E. Horowitz & Sahini, “Data Structure” Galgotia
2. Thareja, Reema, “Data structures using C” Oxford University Press
3. Tenebaum, “Data Structure & program design in C” PHI
4. Lipschutz, “Data Structure” TMH

SEMESTER VI

WEB DESIGN

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 Adobe 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 II

Cyber Security Syllabus

Unit 1

Fundamentals of Cyber Security and Threat Landscape Importance and challenges in Cyber Security, Cyberspace, and Cyber threats, Cyber warfare, CIA Triad, Cyber Terrorism, Cyber Security of Critical Infrastructure

Cyber Attacks and Intrusion Techniques Types of Hackers - Hackers and Crackers, Cyber-Attacks and Vulnerabilities, Malware threats, Sniffing, Gaining Access - Escalating Privileges, Executing Applications, Hiding Files, Covering Tracks. Worms, Trojans, Viruses, Backdoors.

Unit 2

Cyber crime and Cyber law

Classification of cyber crimes, Common cyber crimes- cyber crime targeting computers and mobiles, cyber crime against women and children, financial frauds, social engineering attacks, malware and ransomware attacks, zero day and zero click attacks, Cybercriminals modus-operandi , Reporting of cyber crimes, Remedial and mitigation measures, Legal perspective of cyber crime, IT Act 2000 and its amendments, Cyber crime and offences, Organizations dealing with Cyber crime and Cyber security in India, Case studies.

Unit 3

Ethical Hacking and Information Security Practices Ethical Hacking Concepts and Scopes, Threats and Attack Vectors, Information Assurance, Threat Modeling, Enterprise Information Security Architecture, Vulnerability Assessment and Penetration Testing

Social Engineering and Insider Threats Types of Social Engineering - Insider Attack - Preventing Insider Threats - Social engineering Targets and Defence Strategies.

Recommended Books:

1. Cyber Security and Cyber Laws Nilakshi Jain Wiley
2. Cyber Security Nina Godbole Wiley
3. Cyber Security Essentials, James Graham, Richard Howard and Ryan Otson, CRC Press.
4. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin, CRC Press T&F Group.

SEMESTER IV

Artificial Intelligence

Unit-I

Introduction: Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Advantage and Disadvantage of Artificial Intelligence.

Unit-II

Machine Learning: Application of Machine learning Supervised and unsupervised learning, Decision trees, Statistical learning models, learning with complete data - Naive Bayes models. Introduction to Deep Learning, Applications and Challenges of Deep Learning.

Unit-III

Pattern Recognition: Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Classification Techniques – Nearest Neighbor (NN) Rule, Bayes Classifier, K-means clustering algorithms.

Books:

1. Russell S. and Norvig P., “Artificial Intelligence – A Modern Approach”, Pearson Education.
2. Rich E. and Knight K., “Artificial Intelligence”, Tata McGraw Hill.
3. Patterson D. W., “Artificial Intelligence and Expert Systems”, Prentice Hall of India.

