MCA-2301   DATA STRUCTURE

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2301	DATA STRUCTURE	3	1	0	4	4

COURSE PREAMBLE: This course provides an introduction to the basic concepts and techniques of Linear and nonlinear data Structures and Analyze the various algorithm.

COURSE OUTCOMES:

At the end of the Course, the student will be able
- Identify user defined data types, linear data structures for solving real world problems.
- Write modular programs on nonlinear data structures and algorithms for solving engineering problems efficiently.
- State what is an undirected graph, directed graph and apply BFS and DFS to traverse a graph

UNIT-I
Review of C programming language. Introduction to Data Structure: Concepts of Data and Information, Classification of Data structures, Abstract Data Types, Implementation aspects: Memory representation. Data structures operations and its cost estimation. Introduction to linear data structures- Arrays, Linked List: Representation of linked list in memory, different implementation of linked list. Circular linked list, doubly linked list, etc. Application of linked list: polynomial manipulation using linked list, etc.

UNIT-II
Tree: Definitions - Height, depth, order, degree etc. Binary Search Tree - Operations, Traversal, Search. AVL Tree, Heap, Applications and comparison of various types of tree; Introduction to forest, multi-way Tree, B tree, B+ tree, B* tree and red-black tree.

UNIT-III
Stacks: Stacks as ADT, Different implementation of stack, multiple stacks. Application of Stack: Conversion of infix to postfix notation using stack, evaluation of postfix expression, Recursion. Queues: Queues as ADT, Different implementation of queue, Circular queue, Concept of queue and Priority Queue, Queue simulation, Application of queues.

UNIT-IV

Graphs: Introduction, Classification of graph: Directed and Undirected graphs, etc, Representation, Graph Traversal: Depth First Search (DFS), Breadth First Search (BFS), Graph algorithm: Minimum Spanning Tree (MST)- Kruskal, Prim"s algorithms. Dijkstra"s shortest path algorithm; Comparison between different graph algorithms. Application of graphs.

UNIT-V

Sorting: Introduction, Sort methods like: Bubble Sort, Quick sort. Selection sort, Heap sort, Insertion sort, Shell sort, Merge sort and Radix sort; comparison of various sorting techniques. Searching: Basic Search Techniques: Sequential search, Binary search, Comparison of search methods. Hashing & Indexing. Case Study: Application of various data structures in operating system, DBMS etc.

Text Books

1. AM Tanenbaum, Y Langsam& MJ Augustein, "Data structure using C and C++", Prentice Hall India.
2. Robert Kruse, Bruse Leung, "Data structures & Program Design in C", Pearson Education.

Reference Books

1. Aho, Hopcroft, Ullman, "Data Structures and Algorithms", Pearson Education.
2. N. Wirth, "Algorithms + Data Structure = Programs", Prentice Hall.
3. Jean – Paul Trembly , Paul Sorenson, "An Introduction to Structure with application", TMH.
4. Richard, GilbergBehrouz, Forouzan ,"Data structure – A Pseudocode Approach with C", Thomson press.

MCA-2302   COMPUTER NETWORKS & DATA COMMUNICATION

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2302	COMPUTER NETWORKS & DATA COMMUNICATION	3	1	0	4	4

COURSE PREAMBLE: This course is to provide students with an overview of the concepts and fundamentals of computer networks. Topics to be covered include: data communication concepts and techniques in a layered network architecture, communications switching and routing, types of communication, network congestion, network topologies, network configuration and management, network model components, layered network models (OSI reference model, TCP/IP networking architecture) and their protocols, various types of networks (LAN, MAN, WAN and Wireless networks) and their protocols.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Understand the basics of data communication, networking, internet and their importance.
- Analyze the services and features of various protocol layers in data networks.
- Analyze TCP/IP and their protocols.
- Recognize the different internet devices and their functions.

UNIT-I
Introduction: Computer Network, Use of computer networks; Type of networks; Network software: protocol hierarchies. Design; issues for the layers, interface and services, types of services, services primitives; Reference models: The OSI reference model, TCP/IP reference model, Example networks: The Internet, Novel Netware, Window NT.

UNIT-II
Physical layer: Transmission media: magnetic media, Twisted pair, Base band / broadband coaxial cable, fiber optics; Analog, digital, wireless transmission; Transmission and switching; ISDN system architecture, Satellite versus fiber; Terminal handling. The Data link layer Design issues: services provided, framing, Error control, flow control; Error detection and correction; Error correcting codes, Error detecting codes; Elementary data link protocols: Unrestricted simplex, simplex stop and wait, simplex protocol for noisy channels; sliding window protocols: one bit, go back n, selective repeat; DLL in the Internet.

UNIT-III

Medium access sub layer: Static/dynamic channel a llocation in LANs and MANs; multiple access protocols: ALOHA, carrier sense, collision free, limited contention, wireless LAN; IEEE standard 802 for LANs and MANs: Ethernet; token bus, token ring, comparison of 802.3, 802.4, 802.5; Bridges: bridges from 802.x and 802.y, Transparent bridges, High speed LANs.

UNIT-IV

Network Layer: Design issues, Internet organization of network layer; Rating algorithms: optimality principle, shortest path, flooding, Flow - bared, hierarchical, multicast, broadcast; congestion control algorithms: General principle, prevention, Traffic shaping, choke packets, load shading etc.; Internetworking: How network differ, connectionless internetworking, Tunneling, internetworking, fragmentation, firewalls; Network layer in the Internet: IP protocol, IP address, subnets, OSPF, BGP, FTP, telnet, email. etc

UNIT-V

Network Programming: Basically Sockets : Overview, Unix Domain Protocols, Overview, Unix Domain Protocols, socket-address, socket-system calls, reserved ports, passing file descriptions, I/O asynchronous & multiplexing, socket implementations.

References:

1. A.S.Tanenbaum, "Computer Network", 4th addition, PHI
2. Forouzan "Data Communication and Networking 3ed", TMH

MCA- 2303   COMPUTER GRAPHICS & MULTIMEDIA

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2303	**COMPUTER GRAPHICS & MULTIMEDIA**	**3**	**1**	**0**	**4**	**4**

COURSE PREAMBLE: This course familiarizes the students with fundamental algorithms that are used in interactive graphics systems. The students will learn algorithms and techniques of fundamental 3D computer graphics and understand the relationship between the 2D and 3D versions of such algorithms. This course will benefit the students to apply these algorithms and techniques in upcoming real world scenarios.

COURSE OUTCOMES:
At the end of the Course, the student will be able

- Illustrate the algorithm for drawing 2D Primitives.
- Identify the visible and invisible surfaces of 3D objects by using surface detection algorithm.
- Summarize various compression techniques and color models in multimedia.
- Develop animation for graphics design problems.

UNIT-I
Introduction to Raster scan displays, Storage tube displays, refreshing, flickring, interlacing, colour monitors, display processors resolution, working principle of dot matirix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball , tablets and joysticks, graphical input techniques etc.

UNIT-II
Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Beizier Method, B-spline Method.

UNIT-III
2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen. Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection,
phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

UNIT-IV `

An Introduction – Multimedia applications – Multimedia System Architecture – Evolving technologies for Multimedia – Defining objects for Multimedia systems – Multimedia Data interface standards – Multimedia Databases. Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia -Tools, presentation tools, authoring tool.

UNIT-V

Compression & Decompression – Multimedia Data & File Format standards :-TIFF, MIDI, JPEG, DIB, MPEG,RTF, – Multimedia I/O technologies - Digital voice and audio – Video image and animation–Full motion video – Storage and retrieval technologies.

Reference Books:

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI Learning, 3rd Indian reprint edition , 2008.
3. Tay Vaughan, "Multimedia making it work", Tata McGraw Hill edition.
4. Amarendra N Sinha & Arun D Udai , "Computer Graphics", McGraw Hill publication Fundamental Of Computer Graphics and Multimedia, Mukherjee, PHI Learning

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MCA-2304A   COMPILER DESIGN

Subject Code	Subject Name	L	T	P	Credits	Hrs/ week
MCA-2304A	COMPILER DESIGN	3	1	0	4	4

COURSE OBJECTIVES:
1. To teach concepts of language translation and phases of compiler design
2. To describe the common forms of parsers
3. To inculcate knowledge of parser by parsing LL parser and LR parser
4. To demonstrate intermediate code using technique of syntax directed translation
5. To Illustrate the various optimization techniques for designing various optimizing compilers

COURSE OUTCOMES:
At the end of the course students will be able to:
1. Use compiler construction tools and describes the Functionality of each stage of compilation process
2. Construct Grammars for Natural Languages and find the Syntactical Errors/Semantic errors during the compilations using parsing techniques
3. Analyze different representations of intermediate code.
4. Construct new compiler for new languages

UNIT – I
Overview of the Translation Process, A Simple Compiler, Difference between interpreter, assembler and compiler. Overview and use of linker and loader, types of Compiler, Analysis of the Source Program, The Phases of a Compiler, Cousins of the Compiler, The Grouping of Phases, Lexical Analysis, Hard Coding and Automatic Generation Lexical Analyzers, Front-end and Back-end of compiler, pass structure.

UNIT – II
Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers.

UNIT – III
Bottom–Up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR) Syntax Analyzer Generator: YACC, Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment, Control flow, Boolean expression, Array References in arithmetic expressions, procedure calls,   case   statements,   postfix   translation.

UNIT – IV

TYPE CHECKING: Definition of type checking, type expressions, type systems, static and dynamic checking of types, specification of a simple type checker, equivalence of type expressions, type conversions, overloading of functions and operators.

RUN TIME ENVIRONMENTS: Source language issues, Storage organization, storage-allocation strategies, access to non-local names, parameter passing, symbol tables and language facilities for dynamic storage allocation.

UNIT – V

Run Time Memory Management Source Language Issues, Storage Organization, Storage-Allocation Strategies, and Access to Non local Names, Parameter Passing, Symbol Tables, and Language Facilities for Dynamic Storage Allocation, Dynamic Storage Allocation Techniques.

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman (2007), Compilers Principles, Techniques and Tools, 2nd edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman (2001), Principles of compiler design, Indian student edition, Pearson Education, New Delhi, India.
2. Kenneth C. Louden (1997), Compiler Construction– Principles and Practice, 1st edition, PWS Publishing.
3. K. L. P Mishra, N. Chandrashekaran (2003), Theory of computer science- Automata Languages and computation, 2nd edition, Prentice Hall of India, New Delhi, India.
4. Andrew W. Appel (2004), Modern Compiler Implementation C, Cambridge University Press, UK.

SCHOOL OF ENGINEERING
SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES
Programme : Master of Computer Application (MCA) - 2 Year Course

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MCA- 2304B   DISTRIBUTED COMPUTING

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2304B	DISTRIBUTED COMPUTING	3	1	0	4	4

COURSE PREAMBLE:
- To introduce fundamental principles of distributed systems, technical challenges and key design issues.
- To impart knowledge of the distributed computing models, algorithms and the design of distributed system.

COURSE OUTCOMES:

At the end of the Course, the student will be able

- Demonstrate knowledge of the basic elements and concepts related to distributed system technologies;
- Illustrate the middleware technologies that support distributed applications such as RPC, RMI and Object based middleware.
- Analyze the various techniques used for clock synchronization and mutual exclusion
- Demonstrate the concepts of Resource and Process management and synchronization algorithms
- Demonstrate the concepts of Consistency and Replication Management
- Apply the knowledge of Distributed File System to analyze various file systems like NFS, AFS and the experience in building large-scale distributed applications.

Unit I
Evolution of Distributed Computing -Issues in designing a distributed system- Challenges-Minicomputer model – Workstation model - Workstation-Server model– Processor - pool model - Trends in distributed systems. Distributed computing environment, web based distributed model, computer networks related to distributed systems and web based protocols.

Unit II
Synchronization :- Clock Synchronization, Logical Clocks, Election Algorithms, Mutual Exclusion, Distributed Mutual Exclusion-Classification of mutual Exclusion Algorithm, Requirements of Mutual Exclusion Algorithms, Performance measure. Non Token based Algorithms: Lamport Algorithm, Ricart-Agrawalas Algorithm, Maekawas Algorithm Token Based Algorithms: Suzuki-Kasamis Broadcast Algorithms, Singhals Heurastic Algorithm, Raymonds Tree based Algorithm, Comparative Performance Analysis.

Unit III

Message Passing: Inter process Communication, Desirable Features of Good Message-Passing Systems, Issues in IPC by Message, Synchronization, Buffering, Multidatagram Messages, Encoding and Decoding of Message Data, Process Addressing, Failure Handling, Group Communication.

Remote Procedure Calls: The RPC Model, Transparency of RPC, Implementing RPC Mechanism, Stub Generation, RPC Messages, Marshaling Arguments and Results, Server Management, Communication Protocols for RPCs, Complicated RPCs, Client-Server Binding, Exception Handling, Security, Some Special Types of RPCs, Lightweight RPC, Optimization for Better Performance.

Unit IV

Distributed Shared Memory: Design and Implementation issues of DSM, Granularity, Structure of Shared memory Space, Consistency Models, replacement Strategy, Thrashing, Other Approaches to DSM, Advantages of DSM.
Synchronization: Clock Synchronization, Event Ordering, Mutual Exclusion, Election Algorithms.

Unit V

Distributed File Systems: Desirable Features of a good Distributed File Systems, File Models, File Accessing Models, File-shearing Semantics, Filecaching Schemes, File Replication, Fault Tolerance, Design Principles, Sun's network file system, Andrews file system, comparison of NFS and AFS.
Naming: Desirable Features of a Good Naming System, Fundamental Terminologies and oncepts, Systems-Oriented Names, Name caches, Naming & security, DCE directory services.

Reference Books:
1. Distributed OS by Pradeep K. Sinha (PHI)
2. Tanenbaum S.: Distributed Operating Systems, Pearson Education
3. Tanenbaum S. Maarten V.S.: Distributed Systems Principles and Paradigms, (Pearson Education)
4. George Coulouris, Jean Dollimore. Tim Kindberg: Distributed Systems concepts and design.

MCA-2304C SOFT COMPUTING

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2304C	SOFT COMPUTING	3	1	0	4	4

COURSE PREAMBLE:

The objective of this course is to introduce basic concepts and applications of soft computing tools such as neural networks, fuzzy logic systems, and several optimization techniques like genetic algorithms, evolutionary computation, simulated annealing etc. Also it covers soft computing based solutions for real-world Electrical Engineering problems.

COURSE OUTCOMES:

- Describe the role of artificial intelligence techniques in real world
- Apply fuzzy logic controller for electrical engineering problem
- Apply different neural network controller for electrical engineering problem

UNIT I

Overview of Soft Computing, Difference between Soft and Hard computing, Brief descriptions of different components of soft computing including Artificial intelligence systems Neural networks, fuzzy logic, genetic algorithms. Artificial neural networks Vs Biological neural networks, ANN architecture, Basic building block of an artificial neuron, Activation functions, Introduction to Early ANN architectures (basics only)-McCulloch & Pitts model, Perceptron, ADALINE, MADALINE

UNIT II

Artificial Neural Networks: Supervised Learning: Introduction and how brain works, Neuron as a simple computing element, The perceptron, Backpropagation networks: architecture, multilayer perceptron, backpropagation learning-input layer, accelerated learning in multilayer perceptron, The Hopfield network, Bidirectional associative memories (BAM), RBF Neural Network.

UNIT III

Artificial Neural Networks: Unsupervised Learning: Hebbian Learning, Generalized Hebbian learning algorithm, Competitive learning, Self- Organizing Computational Maps: Kohonen Network.

UNIT IV

Fuzzy Logic Crisp & fuzzy sets fuzzy relations fuzzy conditional statements fuzzy rules fuzzy algorithm. Fuzzy logic controller.

UNIT V

Genetic algorithms basic concepts, encoding, fitness function, reproduction-Roulette wheel, Boltzmann, tournament, rank, and steady state selections, Convergence of GA, Applications of GA case studies. Introduction to genetic programming- basic concepts.

REFERENCES:

1.R. Rajasekaran and G. A and Vijayalakshmi Pa, Neural Networks, Fuzzy Logic, and Genetic Algorithms: Synthesis and Applications, Prentice Hall of India
2. D. E. Goldberg, Genetic Algorithms in Search, Optimisation, and Machine Learning, Addison-Wesley

SUPPLEMENTARY READING
1. L. Fausett, Fundamentals of Neural Networks, Prentice Hall
2. T. Ross, Fuzzy Logic with Engineering Applications, Tata McGraw Hill

MCA- 2305A   JAVA

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305A	JAVA	3	1	0	4	4

COURSE PREAMBLE:

1. To understand the basic concepts and fundamentals of platform independent object oriented language.

2. To demonstrate skills in writing programs using exception handling techniques and multithreading.

3. To understand streams and efficient user interface design techniques.

Course Outcomes: After successful completion of the course, the students are able to

1. Use the syntax and semantics of java programming language and basic concepts of OOP.

2. Develop reusable programs using the concepts of inheritance, polymorphism, interfaces and packages.

3. Apply the concepts of Multithreading and Exception handling to develop efficient and error free codes.

4. Design event driven GUI and web related applications which mimic the real word scenarios

Unit I

Introduction: Introduction to java, java buzzword, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects: Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Unit II

Synchronization :- Inheritance and Polymorphism : Inheritance in java, Super and sub class, Overriding, Object class, Polymorphism Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, UTIL package.

Unit III

Event and GUI programming: Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames. Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

Unit IV

Strings: Exploring the String class, String buffer class, Command-linearguments.

Library: Date class, Wrapper classes.

Multithreading: Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter Thread communication, daemon threads, deadlocks. I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Unit V

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics.

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar.

Text Book:
1. Java The Complete Reference 9th Edition, Herbert Schildt, McGraw Hill Education (India) Private Limited, New Delhi.

Reference Books:
1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
2. Introduction to Java programming, By Y.DanielLiang,Pearson Publication.

MCA- 2305B   DOT NET

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305B	DOT NET	3	1	0	4	4

COURSE PREAMBLE:
- To Understand code solutions and compile C# projects within the .NET framework.
- To Design and develop professional console and window based .NET application
- To Demonstrate knowledge of object-oriented concepts Design user experience and functional requirements C#.NET application.
- To Construct classes, methods, and assessors, and instantiate objects.
- To Understand and implement string manipulation, events and exception handling within .NET application environment

Course Outcomes: After successful completion of the course, the students are able to
- Create and manipulate GUI components in C#.
- Design and Implement Windows Applications using Windows Forms, Control Library, Advanced UI Programming & Data Binding concepts
- Design and Implement database connectivity using ADO.NET in window based application.
- Identify and resolve problems (debug /trouble shoot) in C#.NET window based application
- Identify Industry defined problem and suggesting solution(s) using .NET application.

Unit I
Introduction: Basic .NET Programming using C#, Introduction to .NET technologies, Structure of a C# Program, Data Types, Basic Control Structures, Introduction to classes and objects, Arrays, Introduction to Visual Studio .NET, Introduction to debugging, Classes and Objects, this keyword, Static Properties and Indexer, Inheritance, Overloading (Compile Time Polymorphism), Overriding and Runtime Polymorphism System, Object Boxing and Unboxing, Typecasting, Memory Management, Exception Handling.

Unit II
Visual Basic fundamentals:- The Visual Basic .NET Development Environment, The element of VB.NET, VB.NET operators, Software design, Conditional structure and control flow, Methods.
Classes and Objects: - Types, Structure and Enumeration, Classes, Interfaces, Exception handling and Classes, Collections, Arrays and other Data Structure.

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Unit III
Advance design concepts, Patterns, Roles and Relationships, Advanced Interface Patterns, Adapters and Delegates and Events Data Processing and I/Writing Software with Visual Basic .NET, Interfacing with the End User, Introduction to ASP.NET and C#.NET and their features.

Unit IV
Installing ASP.NET framework, overview of the ASP .net framework, overview of CLR, class library, overview of ASP.net control, understanding HTML controls, study of standard controls, validations controls, rich controls. Windows Forms: - All about windows form, MDI form, creating windows applications, adding controls to forms, handling Events.

Unit V
Understanding and handling controls events, ADO.NET- Component object model, ODBC, OLEDB, and SQL connected mode, disconnected mode, dataset, data-reader. Data base controls: Overview of data access data control, using grid view controls, using details view and frame view controls, ado .net data readers, SQL data source control, object data source control, site map data source.

REFERENCES:
1. C# for Programmers by Harvey Deitel, Paul Deitel, Pearson Education
2. Balagurusamy; Programming in VB; TMH
3. Web Commerce Technology Handbook by Daniel Minoli, Emma Minoli , TMH
4. Web Programming by Chris Bates, Wiley
5. XML Bible by Elliotte Rusty Harold ,
6. ASP .Net Complete Reference by McDonald, TMH.
7. ADO .Net Complete Reference by Odey, TMH.

MCA- 2305C   WEB TECHNOLOGY

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2305C	WEB TECHNOLOGY	3	1	0	4	4

COURSE PREAMBLE:

The main objective of the course is present the basic web technology concepts that are required for developing web applications. The key technology components are descriptive languages, server side program elements and client side program elements. In addition the course gives specific contents that are beneficial for developing web-based solutions, like relational data-base communication basics and information security principles and approaches.

Course Outcomes: After successful completion of the course, the students are able to

- Students are able to develop a dynamic webpage by the use of java script and
- DHTML.
- Students will be able to write a well formed / valid XML document.
- Students will be able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
- Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
- Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.

Unit I

Introduction: History of the internet, internetworking concepts, architecture, and protocol: switch, router, protocols for internetworking, internet address and domains. Introduction World Wide Web (WWW), working of web browser and web server, N-tier architecture, services of web server, Common gateway interface (CGI), Uniform Resource Locator (URL), Hyper Text Transfer Protocol (HTTP), feature of HTTP protocol HTTP request-response model, Hyper Text Transfer Protocol Secure (HTTPS).

Unit II

Introduction to Hyper Text Markup Language (HTML), HTML elements, XHTML syntax and Semantics, eXtensible Markup Language (XML), element, attributes, entity declarations. DTD files and basics of Cascading Style Sheet (CSS). Document object Model (DOM) history and levels, Document tree, DOM event handling.

Unit III

Introduction to Java Script, Basic concepts, variables and data types, functions, conditional statements, Loops, Operators, Arrays, Standard Objects and form processing in Java.

Unit IV

Evaluation of web applications, type of web documents, feature of web pages, multitier web applications, introduction to Apache web server. Security in application: authentication, authorization, auditing, security issues, security on the web, proxy server, Firewall. Middleware Concepts, CORBA, Java Remote Method Invocation (RMI), EJB, Microsoft's Distributed Component Object Model(DCOM) Web server and its deployment, Web client, services of web server, mail server proxy server, multimedia server.

Unit V

Introduction to servlet, Overview Architecture Handling HTTP Request, Get and post request, redirecting request multi-tier applications. Introduction to JSP, basic JSP, Java Bean class and JSP. Setting up an Open Data Base Connectivity (ODBC) data source.

REFERENCES:

1. Web Technologies- A computer science perspective By Jeffrey C. Jackson, Pearson Eduction .
2. Web Technologies-TCP/IP Architecture, and Java Programming By Achyut S. Godbole and Atul Kahate.
3. An introduction to Web Design Programming by Paul S. Wang Sanda, S Katila, CENGAGE Learning.

MCA- 2306 MINOR PROJECT

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2306	**Minor Project**	**0**	**0**	**8**	**8**	**8**

COURSE PREAMBLE: To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses. To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems. To give students an opportunity to do something creative and to assimilate real life work situation in institution. To adapt students for latest development and to handle independently new situations. To develop good expressions power and presentation abilities in students.

COURSE OUTCOMES:

At the end of this course, students will be able to:
 1. Students will be able to practice acquired knowledge within the chosen area of technology for project development.
2. Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
3. Reproduce, improve and refine technical aspects for engineering projects.
4. Work as an individual or in a team in development of technical projects.
5. Communicate and report effectively project related activities and findings.

MCA- 2307 Programming Lab (Data structure & Computer Graphics)

Subject Code	Subject Name	L	T	P	Credits	Hrs/week
MCA-2307	**Programming Lab (Data structure & Computer Graphics)**	**0**	**0**	**2**	**2**	**2**

COURSE PREAMBLE : The course is designed to develop skills to design and analyze simple linear and non linear data structures. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem. It enables them to gain knowledge in practical applications of data structures .

COURSE OUTCOMES :

At the end of the Course, the student will be able

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identity the appropriate data structure for given problem
- Have practical knowledge on the applications of data structures

LIST OF EXPERIMENTS:-

1. Implement Bresenham's line drawing algorithm for all types of slope.

2. Create and rotate a triangle about the origin and a fixed point.

3. Clip a line using Cohen-Sutherland algorithm

4. Perform Linear Search and Binary Search on an array..

5. Create doubly linked list with nodes having information about an employee and perform Insertion at front of doubly linked list and perform deletion at end of that doubly linked list.

6. Create circular linked list having information about an college and perform Insertion at front perform Deletion at end.

7. To implement Insertion sort using array as a data structure.

8. To implement Merge sort using array as a data structure.

9. To implement Quick sort, Bubble sort using array as a data structure.

10. To implement Selection sort using array as a data structure.