

PGDCA Course to be offered at CAL-C Centres jointly with PSBTE				
	Module-I	Total Duration	Theory	Practical
Sem - I				
1	Computer Fundamentals	112	48	64
2	Programming using C and Data Structures	112	48	64
3	Oops with C++	112	48	64
4	Web Technology - I (HTML,Core Java and Java Script)	112	48	64
5	Generic Skills	32	32	-
	Semester Total	480	224	
Sem - II				
1	Computer Networks	64	48	16
2	RDBMS	112	48	64
3	Web Technology - II (Intoduction to .NET Technologies, .NET Framework, ASP.NET)	112	48	64
4	SE and Project Management	48	48	-
5	MIS	32	32	
6	Project Work	112	-	112
	Total	480	224	

Computer Fundamentals		
		Total Hrs : 112 (T: 48, P: 64)
Topics	Theory	Prac.
Section-I		
<p>DATA PROCESSING: Data Processing and Data Processing Systems, Electronics Data Processing Systems, Data vs Information, Difference Between Data and Information, Need for Information. Value of Information, Type of Processing Batch, Online and Real Time Processing.</p> <p>COMPUTER SYSTEM: What is a Computer? INPUT devices, CPU, OUTPUT devices, CPU, Memory Unit, ALU, Control Unit, INPUT, Printers-Impact and Non-Impact, Memories;</p> <p>DATA REPRESENTATION Number Systems: Decimal, Binary, Octal. Hexadecimal, Recording Modes-BCD, ASCH. EBCDIC,</p> <p>SYSTEM SOFTWARE: Computer Languages- Low Level. High Level, 40L, Compilers. Interpreters, Assemblers, Application and System Software, Utilities Packages, Virus & Scanners.</p>	08	0
Section-II		
<p>OPERATING SYSTEM: Operating System functions and characteristics, historical evolution, Real time systems, and Distributed systems, Methodologies for implementation of O/S service system calls, system programs, and Interrupt mechanisms?</p> <p>CPU SCHEDULING: Levels of Scheduling, Comparative study of scheduling algorithms, Multiple processor scheduling.</p> <p>PROCESSES MANAGEMENT: Critical section problem, Semaphores, Context Switching; Process States; Process States Transitions; Process Control Block (PCB); Suspend/Resume Operations, Inter-process Communications.</p> <p>DEADLOCKS: Deadlock characterization, prevention and avoidance, detection and recovery, practical considerations</p>	12	4
Section-III		
<p>STORAGE MANAGEMENT: Storage allocation methods: Single , Multiple contiguous allocation, Paging; Segmentation combination of Paging Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.</p> <p>FILE SYSTEMS: Functions of the system, File access and allocation methods, Directory Systems: Structured Organizations, directory and file protection mechanisms, implementation issues: hierarchy of file and device management.</p> <p>CASE STUDIES: Comparative study of DOS, WINDOW, UNIX & LINUX system.</p>	12	20
Section-IV		
<p>MS-WORD: Word processing using MS-WORD, File handling, Editing, Formatting, spell checking, Mail merge & Table handling & Insertion, importing, exporting & object linking embedding, printing operation.</p> <p>MS-EXCEL : Spreadsheet: features, uses & benefits in general, Entering data & selecting cells, editing worksheet data, formatting worksheet, creating Formulae, function & charts /graphs, multi operation, data base management. Presentation Tools: features, uses & benefits in general.</p> <p>MS POWER POINT: Creating & saving presentation templates & view (slide view, notes view, outline view, slide show) Formatting text, slides & graphs, animations, slides transition, multi operation.</p> <p>MS-ACCESS Introduction to Ms-Access: Objects, Tables, Queries, Forms, Creating a Database</p>	16	40
Total	48	64

Programming in C and Data Structure		
		Total Hrs : 112 (T: 48, P: 64)
Topics	Theory	Prac.
Section-I		
<p>FUNDAMENTALS OF C : Introduction of C, C Character Set, Variables, Data Types, Operators, their precedence, expressions and their evaluation.</p> <p>OPERATORS AND EXPRESSIONS : Arithmetic, Unary, Relational and Logical, Assignment and Conditional Operators</p> <p>INPUT/OUTPUT FUNCTIONS: Formatted I/O, Character I/O & String I/O Functions.</p> <p>CONTROL STRUCTURES: Taking decisions using if, if-else, switch constructs and Conditional Operator, Description of break and continue Statements. Performing loops using for, while, do-while Constructs.</p> <p>FUNCTIONS: Library Functions vs User-Defined Functions, Declaring (Prototyping) and defining User-Defined functions, ways of passing parameters to functions, specifying Argument data types, Recursion, Storage Classes.</p>	12	16
Section-II		
<p>ARRAYS & STRING: What are Arrays? Declaring arrays, initializing arrays, processing of arrays, passing arrays arguments to functions, Multidimensional arrays. What are Strings? How strings are handled in C? String functions, arrays of string.</p> <p>POINTERS: What is a pointer variable? Declaring pointers, accessing values via pointers, pointer arithmetic, pointer to strings, passing arguments using pointers.</p> <p>STRUCTURE AND UNIONS: Defining a structure type, declaring variables of structure type, initializing structures. Accessing Structure Elements, Use of assignment Statement for structures, array of structures, nested structures, Unions; Declaring a Union, Accessing elements of a type union.</p> <p>MANAGING DATA FILES: Creating, Processing a file, Standard Input/Output, System Level I/O, File updating</p>	12	16
Section-III		
<p>INTRODUCTION TO DATA STRUCTURES: Primitive and Composite, Arrays, Matrices, Sparse Matrices, Linear Search, Binary Search, Insertion Sort, Selection Sort, Bubble Sort, String, Representation and Manipulation, Complexity of Algorithms, Records and Pointers</p> <p>LINKED LISTS : Introduction, Representation of Linked list in memory, Traversing, Searching, Memory Allocation, Insertions and Deletions in list, Sorted Linked List, Circular List, Header List, Two – Way List;</p>	12	16
Section-IV		
<p>STACKS: Introduction to stacks, Recursion, array representation of stacks, Linked and Array representation of Stacks, Push and Pop from stacks, Quicksort, Introduction to Queues, Deques, Polish Notation, Priority Queues.</p> <p>TREES: Binary Trees, Threaded Binary Trees, Balanced Tree, Different tree traversal algorithms, Binary Search Tree, Huffman Tree, Heap Sort, AVL Search Trees, B Trees, m-way Search Trees</p> <p>REPRESENTATION OF GRAPHS AND APPLICATIONS: Adjacency Matrix, Path Matrix, Warshall's Algorithm, Linked Representation of a Graph, Traversing a Graph; Sorting and Searching: Radix Sort, Merge Sort, Hashing</p>	12	16
Total	48	64

Ops with C++		
		Total Hrs : 112 (T: 48, P: 62)
Topics	Theory (Hrs)	Practical (Hrs)
Section-I		
<p>INTRODUCTION to OOPs and C++: OOP Concepts, Top down and bottom up approaches of programming, Over view of C++: Character and string literals, Variables, Objects and their declarations, operators.</p> <p>DATA TYPES, OPERATORS AND STATEMENTS: Identifiers and Keywords, Constants (String constants, Numeric constants, Character constants), C++ Operators , Type Conversion, Statements, compound conditions, Boolean expression, nested expression.</p> <p>LOOPS AND ITERATIONS/ CONTROL STATEMENTS: While statements, do...while, for, break, continue. Conditional Expressions (if statement, if else statement), switch Statement, Loop, GoTo statement, WRITING A PROGRAM IN C++: Declaration of Variables, Statements, Simple C++ Programs, Features of iostream.h, Keyboard and screen I/O, Manipulator Functions, Predefined manipulators, Input and Output (I/O) Stream Flags.</p> <p>FUNCTIONS AND PROGRAM STRUCTURES: Function types, passing by reference, passing by constant reference, scope of functions, overloading, Defining a Function, return Statement, Actual and Formal Arguments, Local and Global Variables, Default Arguments, Multifunction Program, Storage Class Specifiers (Automatic variable, Register variable, Static variable, External variable), Recursive Function, Preprocessors (Simple macro definitions, Macro with parameters, Other Processing Techniques, Conditional Compilation), Header Files, Standard Functions.</p> <p>POINTERS AND REFERENCES: Introduction to pointers and references Pointer Declaration , Pointers ,Arithmetic and Functions, objects and values, returning a reference, new and delete operators, Pointer and one dimensional array, Pointer and multidimensional array.</p> <p>STRINGS: Strings, input output, array of strings, string related library functions</p>	16	20
Section-II		
<p>CLASSES AND OBJECTS: Introduction, class declaration constructors, destructors, polymorphism, access functions, copy constructors. Operator Overloading, conversion operators, string classes composition and inheritance</p> <p>STRUCTURES AND CLASSES: Declaration of Class, Member Functions, Defining the Object of a Class, Accessing a Member of Class, Array of Class Objects, Pointers and Classes, Unions and Classes, Classes within Classes (Nested Class), Constructors ,Destructors, Inline Member Functions, Static Class Members Friend Functions, Dynamic Memory Allocations.</p> <p>Virtual Functions: Needs, Pure virtual function, virtual destructor, virtual derivation, abstract class.</p>	12	16
Section-III		
<p>INHERITANCE: Single Inheritance, Types of Base Classes (Direct base classes, Indirect base classes), Types of Derivation (Public inheritance, Private inheritance, Protected inheritance), Ambiguity in Single Inheritance, Array of Class Objects and Single Inheritance, Multiple Inheritance (Array of class objects and multiple inheritance, Ambiguity in the multiple inheritance), Container Classes, Member Access Control (Accessing the public data, Accessing the private data, Accessing the protected data, Accessing private member by friend class).</p> <p>OVERLOADING: Function Overloading (Function overloading with various data types, Function overloading with arguments, Scoping rules for function overloading)Operator Overloading, Overloading assignment operator, Overloading of Binary Operators, Overloading arithmetic operators, Overloading of comparison operators, Overloading of Unary Operators).</p>	08	12

Section-IV		
<p>POLYMORPHISM: Polymorphism, Early Binding, Polymorphism with Pointers, Virtual Functions, Late Binding, Pure Virtual Functions, Abstract Base Classes, Constructors under Inheritance, Destructors under Inheritance, Virtual Destructors, Virtual Base class</p> <p>GENERIC PROGRAMMING & EXCEPTION HANDLING: Template functions, Template class, Exception handling features of C++.</p> <p>FILE HANDLING: Hierarchy of File Stream classes, Opening and Closing files, File modes, testing for errors, File pointers and their manipulations, ASCII & Binary files, Sequential and Random access files.</p> <p>File pointers and their manipulations, ASCII & Binary files, Sequential and Random access files</p>	12	16
TOTAL	48	64

Web Technology-I		
		Total Hrs : 112 (T: 48, P: 64)
Topics	Theory	Prac.
Section:-I		
<p>INTRODUCTION TO HTML: Information Files Creation; Web Server; Web Client/Browser, Designing a Home Page, History of HTML, HTML Generations, HTML Tags, Paired Tags, HTML Documents; Anchor Tag; Hyper Links.</p> <p>HEAD AND BODY SECTIONS: Commonly used HTML Commands , Titles and Footers; Header Section; Prologue; Links; Colorful Web Page; Comment Lines.</p> <p>DESIGNING THE BODY SECTION: Heading Printing; Aligning the Headings; Horizontal Rule; Paragraph; Tab Setting; Images and Pictures; Embedding PNG Format Images. Text Formatting Emphasizing Material in a Web Page Text Styles, Other Text Effects, Spacing. Headings in a List; Ordered Lists (Numbering); Nested Lists, Definition Lists.</p> <p>TABLE HANDLING: Tables; Table Creation in HTML; Width of the Table and Cells; Cells Spanning Multiple Rows/Columns; Coloring Cells; Column Specification. FRAMES: Frame Definition; Nested Framesets.</p> <p>Forms: Action Attribute; Method Attribute; Enctype Attribute; Drop Down List.</p> <p>ORDERED AND UNORDERED LISTS: Types of Lists; Unordered Lists Adding Graphics to HTML Documents.</p> <p>DHTML AND STYLE SHEETS: Introduction to DHTML, Defining Styles; Linking a Style Sheet to an HTML Document; In-line Styles; Internal & External Style Sheets; Internal Style Sheets; Multiple Styles.</p>	12	16
Section:-II		
<p>INTRODUCTION TO JAVASCRIPT: JavaScript in Web Pages, The Advantages of JavaScript.</p> <p>JAVASCRIPT GRAMMAR: Writing JavaScript into HTML; Building Up JavaScript Syntax; Basic Programming Techniques ,Data Types and Literal, Type Casting, Creating Variables, Incorporating variables in a Script, Variables, operators, expressions, statements, object, function and methods, Variables and Data ,The JavaScript Array, The JavaScript Array and its length Property;</p> <p>TYPES: Local variables, global variables, Data Types.</p> <p>OPERATORS: Operators and Expressions in JavaScript (Arithmetic Operators, Logical Operators, Comparison Operators, String Operators, Assignment Operators, Arithmetical & computational, Boolean, comparison, +string, assignment and special.</p> <p>STATEMENTS: If-else, do-while, while-do, for, loop, Break-Continue, switch. Conditional Checking, Super Controlled - Endless Loops ,JavaScript Programming Constructs; Functions: Defining function, Calling Function, Examples of function Functions in JavaScript.</p>	12	16
Section:-III		
<p>EVENT HANDLERS: Click, Change, Focus Blur, Mouseout, Mouseover, Select Submit, Resize, Unload, Load, Events, Alerts, Password, confirmation, Browser Detection, Redirection, Opening a new window, Placing text in a Browser; Dialog</p> <p>THE JAVASCRIPT DOCUMENT OBJECT MODEL: Objects: Document Object Model, Properties, Method Creating objects, Introduction (Instance, Hierarchy); The JavaScript Assisted Style Sheets DOM, Events Using JavaScript.</p> <p>FORMS USED BY A WEB SITE: The Form Object; The Form Object's Methods , Other Built-In Objects in JavaScript (The String Object, The Math Object, The Date Object); User Defined Objects .</p> <p>Cookies: What are Cookies; Setting a Cookie</p>	12	16
Section:-IV		
INTERFACES: Introduction; Defining Interfaces; Extending Interfaces;	12	16

<p>Implementing Interfaces; Accessing Interface Variables.</p> <p>PACKAGES: Introduction; System Packages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes.</p> <p>REVIEW OF JAVA LANGUAGE: Introduction; Simple Java Program, More of Java, An application with Two Classes; Java Program Structure, Java Statements; Implementing a Java Program, Java Virtual Machine; Command Line Arguments; Programming Style.</p> <p>CONSTANTS, VARIABLES AND DATA TYPES: Introduction; Constants (Integer constants, Real constants, Single character constants, String constants, Backlash character constants); Variables; Data Types (Integer types, Floating point type, Character type, Boolean type); Declaration of Variables; Giving Values to Variables , Scope of Variable; Symbolic Constants ,Type Casting , Getting Values of Variables; Standard Default Values.</p> <p>OPERATORS AND EXPRESSIONS: Introduction; Arithmetic Operators Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operators; Bit-wise Operators; Special Operators ,Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operator; Type Conversions in Expressions , Operator Precedence and Associativity; Mathematical Functions.</p> <p>MANAGING ERRORS AND EXCEPTIONS: Introduction; Types of Errors Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; Using finally Statement; Throwing Our Own Exceptions; Using Exceptions for Debugging.</p> <p>APPLET PROGRAMMING: Introduction; How Applets Differ from Applications; Preparing to Write Applets; Building Applet Code; Applet Life Cycle ,Creating an Executable Applet; Designing a Web Page ,Applet Tag; Adding Applet to HTML File; Running the Applet; More About Applet Tag; Passing Parameters to Applets; Aligning the Display; More about HTML Tags; Displaying Numerical Values; Getting Input from the User .</p> <p>GRAPHICS PROGRAMMING: Introduction; The Graphics Class; Lines and Rectangles; Circles and Ellipses; Drawing Arcs; Drawing Polygons; Line Graphs; Using Control Loops in Applets; Drawing Bar Charts.</p>		
Total	48	64

GENERIC SKILLS		
	Total Hrs. : 32	
TOPICS	Presentation	Activity
ESSENTIALS OF GRAMMAR: Parts of Speech, Punctuation, Vocabulary Building, Phonetics	---	2
OFFICE MANAGEMENT: Types of Correspondence, Receipt and Dispatch of Mail, Filing Systems, Classification of Mail. ,Role & Function of Correspondence, MIS, Managing Computer	---	2
LETTER & RESUME WRITING: Types of Letters-Formal / Informal, Importance and Function, Drafting the Applications, Elements of Structure, Preparing the Resume, Do's & Don'ts of Resume, Helpful Hints	---	4
COMMUNICATION SKILLS: Verbal Communication, Non-Verbal Communication , Effective writing skills	4	---
PRESENTATION SKILLS: Importance of Presentation Skills, Capturing Data, Voice & Picture Integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Styles of Presentation.	8	---
INTERVIEW PREPARATION: Types of Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures	4	---
GROUP DISCUSSION & PRESENTATION: Definition, Process, Guidelines, Helpful Expressions, Evaluation	8	---

Computer Network		
	Total Hrs : 64 (T: 48, P: 16)	
Topics	Theory	Practical
Section -I		
<p>DATA COMMUNICATIONS: Multiplexing, Signaling, Encoding & Decoding, Error Detection & Recovery, Flow Control, Sliding Window, Congestion Management.</p> <p>COMMUNICATION NETWORKS: Introduction to networking, Internet, ATM, Network Components , Network Topologies, Shared Medium, Peer to Peer, Hybrid Technology. bandwidth, bit rate, error rate, transmission delays, modems, speed and compression standards.</p> <p>NETWORK TECHNOLOGIES: Ethernet Technologies, Versions, Token Ring Technologies, WAN Technologies, Wireless Networks (Radio Frequencies, Microwave Frequencies, Infrared Waves).</p>	8	2
Section -II		
<p>OSI LAYERS: OSI Model for Networking, Seven layer OSI architecture of ISO, concepts of layer protocols and layer interfaces. Physical layer concepts, Data Link Layer, Network Layer, Transport Layer, Session Layer, Presentataion Layer, Appplication Layer</p> <p>MULTIPLE ACCESS: Design Issues, Distributed & Centralized Design, Circuit Mode & Packet Mode Design, Implementation Issues, Performance Considerations, Base Technology (FDMA, TDMA, CDMA, Centralized Access, Circuit Mode Access, Poling or Packet Mode Access, Reservation Based Access), Distributed Access (decentralized polling, CSMA, CSMA/CA, CSMA/CD, Busy Tone Multiple Access & Multiple Access Collision Avoidance, Token Passing, ALOHA, Slotted ALOHA, Reservation ALOHA), Hardware Addressing</p>	16	4
Section -III		
<p>SWITCHING: Circuit, Packet Switching, Blocking, ATM Switching, Switching Fabric (Crossbar, Broadcast, and Switching Fabric Elements).</p> <p>NAMING & ADDRESSING: Hierarchical Naming, Addressing, Telephone Networks, Internet, IPv4, Subnetting Ipv4 Networks, Private Networks, Asynchronous Transfer Mode, Name Resolution, Address Resolution Protocol (Arp), RARP</p>	12	4
Section -IV		
<p>LAN STANDARDS: Ethernet, token ring, token bus, MAC layer concepts for LANs, FDDI, radio and satellite broadcast networks.</p> <p>ROUTING: Routing Information, Routing Protocols, Hierarchical Routing, Multicast Routing.</p> <p>SERVICES & APPLICATIONS: File transfer protocol, TFTP, Domain Name System, DHCP, SNMP, Electronic Mail, WWW, HTML, HTTP, RPC & Middleware.</p> <p>SECURITY: Threats, Encryption/Decryption, Firewalls, IP Security, Web Security, E-Mail Security.</p>	12	6
Total	48	16

Relational Data Base Management System(RDBMS)		
Total Hrs :112(T: 48, P: 64)		
Topics	Theory	Prac.
Section-I		
<p>BASIC CONCEPTS: File Systems vs. DMBS, Characteristics of the Data Base Approach, Abstraction and Data Integration, Database users, Advantages and Disadvantages of a DBMS.</p> <p>DATA BASE SYSTEMS CONCEPTS AND ARCHITECTURE: Data Models, Schema and Instances, DBMS architecture and Data Independence, Data Base languages and Interfaces, DBMS functions and component modules.</p>	8	4
Section-II		
<p>ENTITY RELATIONSHIP MODEL: Entity Types, Entity Sets, Attributes & keys, Relationships, Relationships Types, Roles and Structural Constraints, Design issues, E-R Diagrams, Design of an E-R Database Schema, Reduction of an E-R schema to Tables.</p> <p>RELATIONAL DATA MODEL: Relational model concepts, Integrity constraints over Relations, Relational Algebra – Basic Operations.</p>	8	8
Section-III		
<p>RELATIONAL DATA BASE MANAGEMENT SYSTEM: Basic structure, Data Base Structure & its manipulation, Storage Organization, Programming Applications. Conventional Data Models: An overview of Network and Hierarchical Data Models.</p> <p>RELATIONAL DATA BASE DESIGN: Functional Dependencies, Decomposition, Normal forms based on primary keys (1 NF, 2 NF, 3 NF, & BCNF), Multi-valued Dependencies, 4 NF, Join dependencies, 5 NF, Domain key normal form.</p> <p>PRACTICAL DATA BASE DESIGN: Role of Information systems in Organizations, Database design process, physical database design in Relational Database.</p>	16	20
Section-IV		
<p>INTRODUCTION TO SQL PLUS, SQL: DDL, DML, and DCL, views& Queries in SQL, Specifying Constraints & Indexes in SQL.</p> <p>Data types: CHAR, VARCHAR, Number, Date, Long, Raw, Longraw, naming convention of variables, Invoking SQL *PLUS< SQL *PLUS Editor commands, DESC, SAVE TO, GET, RUN, SQL commands; SELECT: FROM Relational, Logical and Special operators for using [WHERE <condition>], Use of Aggregate Functions: Count, Sum, AVG, MIN, MAX and [GROUP BY <column>, [HAVING <condition>"]]. Sorting the result by using [ORDER BY <expn>], Using DISTINCT clause with SELECT.</p> <p>MAKING QUERIES USING MULTIPLE TABLES, Use of Joins: Equijoin. Cartesian .join, Outer Join and Self Join, By use of SET Operators [UNION, INTERSECT, MINUS 1. NESTED QUERIES: Sub queries; using Operators</p> <p>FUNCTIONS: ARITHMATIC FUNCTIONS, CHARACTER FUNCTIONS, DATE FUNCTIONS</p> <p>Sql*Plus Reporting, Defining header, footers column headings, formatting columns, control break reports.</p> <p>PL/SQL, date types variables [%ROWTYPE, &TYPE] constants, assign values to variables, PL/SQL block structure: [Declare Begin Exception END] Writing PL/SQL code, [IF< ELSE, ELSIF, END, IK LOOP, END LOOP, FOR-IN-LOOP WHILE LOOP EXIT WHEN] Cursor Management in PL/SQL : Declare cursor, OPEN< FETCH, CLOSE: Explicit, [%NOTFOUND, %FOUND, %ROWCOUNT, %ISOPEN] Implicit: [SQL%NOTFOUND, SQL%FOUND, SQL%ROWCOUNT, SQL%ISOPEN] PL/SQL Records, Exception handling in PL/SQL.</p>	16	32
Total	48	64

Web Technology-II		
	Total Hrs :112 (T: 48, P: 64)	
Topics	Theory	Prac.
Section-1		
<p>INTRODUCING .NET: What is .Net Framework Components of a .NET Application, Migrating Existing Applications .NET, ASP.NET, and Distributed Application Development: The .NET Framework Active Server Pages : ASP.NET Page Basics, Server Control Syntax, Code Basics, Page Life Cycle, Input Validation, Web Services, XML Configuration File, Security Infrastructure, Improved ASP.NET Availability and Performance; Distributed Application Architecture. Functional Overview, Designing Distributed Applications, Fundamental Application Boundaries: Presentation, Logic, and Data Services, Coupling, Multitiered Design, +COM,CLR,Assembling,</p> <p>THE .NET STANDARDS: Web Standards, Web Services Standards, Language and Infrastructure Standards</p> <p>VISUAL STUDIO .NET: .NET and Visual Studio .NET, The Development Environment, Building a .NET Project, Installation Steps.</p> <p>THREE TIER ARCHITECTURE: The .NET Paradigms: Building Distributed .NET Applications, Data Access Layer, Business Logic Layer, Presentation Layer Web User Interface with ASP.NET.</p> <p>NET EXPOSED: .NET Framework, Deployment and Version Compatibility Request Objects: Forms, Using .NET Controls, Using the Form Collection; Query String, Using Parameters, Parameters Spaces, Query String Collections. Server Variables; Introduction to Name Spaces, Manage & Unmanaged Code, Hash Tables, Shadowing, Spaces.</p>	8	8
Section-II		
<p>INTRODUCTION TO ASP.NET: A Review of Classic ASP, ASP.NET Web Applications, Rendering HTML with Server Controls, Using ASP.NET to Deliver XML Web Services.</p> <p>Classic ASP vs. ASP.NET , Introduction to Web Forms , Controlling Page Layout , Targeting a Browser , Investigating Server Controls , Validating Data with Validation Controls , Data Binding with ASP.NET</p> <p>Working with Web Forms Controls: Introduction to Web Forms Controls , Simple Input Controls , HyperLinks and Button Controls , List Controls</p> <p>VALIDATING USER INPUT: Overview of ASP.NET Validation Controls, Using the Simple Validators, Using the Complex Validators, Summarizing Results with the Validation Summary Control ,Compare, Regular expression</p> <p>AJAX TECHNOLOGIES: The Calendar Control , The Ad Rotator Control , Script Manager</p> <p>XML Introduction to XML Controls, How to use with data bound controls</p>	12	16
Section-III		
<p>INTRODUCTION TO ADO.NET: Overview; ADO.NET Name Spaces; Managed Providers(Connection, Command, Data Reader, Parameter Binding with SQL Commands, Stored Procedures and Parameter Binding); The Dataset Object(Data Adapter, Data Table, Data Views, Data Relations); Error Handling; Database Transactions; Concurrent Database Access; ADO.NET Performance, How to retrieve data with data bound Control</p> <p>WHAT'S WRONG WITH ADO? Filling a DataTable Manually , Connecting to Data, Reading Data using the DataReader Object, Manipulating Data with the Data Adapter and DataSet Objects , Using DataRelation Objects to Relate Data, Updating Data and the Command Builder Object, ADO.NET and XML</p> <p>ACCESSING DATA WITH ADO.NET: Overview of ADO.NET , Connecting to Data , Executing Commands , Working with Data , Choosing an ADO.NET Provider</p> <p>USING THE DATALIST AND REPEATER CONTROLS: Overview of List-Bound Controls , Creating a Repeater Control , Creating a DataList Control</p> <p>Working with the DataGrid Control: Introduction to the DataGrid , Setting Up the DataGrid , Using Advanced DataGrid Features , Adding Advanced</p>	16	24

<p>Features</p> <p>MANAGING DATA WITH ADO.NET DATASETS: The Role of DataSets in ADO.NET , Using DataSets in ASP.NET , Saving Datasets in Session State , Using DataTable Constraints and DataSet Data Relations , Using DataSets with Data Adapters to Modify Data , The Transactional Model in DataSets</p> <p>CONSUMING XML WEB SERVICES: Creating Web Services Clients , HTTP Clients , Creating .NET Consumers , Web Services and Legacy Clients , Discovering Web Services Using UDDI</p> <p>Crystal reports using ADO.NET</p>		
Section-IV		
<p>INTRODUCTION TO STATIC MANAGEMENT: Security,Cookies,Types of cookies, Brief Introduction ,Session, Types of session,Queries,String,View State,Rollback,Forms Base, Passport windows, Authentication, Redirect; Cookies; Write File; The Application Object, Event Handlers, Using Event Handlers to Determine, Using Application Variables, Storing Global Information, Using the Lock and Unlock Methods, Using Application Object Collections: Contents and Static Objects</p> <p>The Session Object: Session Event Handlers, Using Event Handlers to Determine, Using Session Variables).</p> <p>ASP.NET CONTROLS: Intrinsic Control (Using the asp: TextEdit Control, Using the asp: Check-Box Control, Using the asp: Radio-Button Control); List Controls (Using the Repeater Control, Using the DataList Control); Rich Controls (Calendar Control); Validation Controls.</p> <p>DATA BOUND CONTROLS: Repeater Control; DataList Control; DataGrid Control; The Data History Application.</p> <p>CREATING CONSOLE APPLICATIONS AND WINDOWS SERVICES IN .NET: Investigating Console Applications , Creating a Console Application , Debugging Console Applications , Investigating Windows Services , Creating a Simple Windows Service , Debugging Windows Services</p> <p>WEBFORMS: Classic HTML and Server-Side Controls; HTML Controls; Web Controls; Intrinsic Web Controls, Intrinsic Web Controls; Buttons and Links; WebForms Examples (Shakespeare Program, Guessing Game, Temperature Calculator).</p> <p>WEB SERVICES: What is a Web Service? ; What Is SOAP? ; SOAP Packages; Why Is SOAP Important for Web Services? ; Why are Web Services Useful? ; Real World Scenarios for Using Web Services; Writing a Web Service; A Health tip Web Service; A Credit Card Validator Service; Consuming a Web Service.</p> <p>CREATING WEB SERVICES: Introduction to Web Services , Creating a Simple Web Service , Investigating the WSDL, Creating Web Service Consumers , Handling Asynchronous vs. Synchronous Web Service Calls</p>	12	16
Total	48	64

Software Engineering & Project Management		
		Total Hrs :48(T: 48)
Topics	Theory	Pract.
Section-I		
<p>INTRODUCTION : The Software Problem (Software is Expensive, Late, Costly and Unreliable, Problem of Change and Rework); Software Engineering Problem (Problem of Scale, Cost, Schedule and Quality and Consistency); The Software Engineering Approach (Phased Development Process, Project Management and Metrics).</p> <p>SOFTWARE PROCESSES : Software Process (Processes, Projects, and Products, Component Software Processes); Characteristics of a Software Process (Predictability, Support Testability and Maintainability, Early Defect Removal and Defect Prevention, Process Improvement); Software Development Process (A Process Step Specification, Waterfall Model, Iterative Enhancement, The Spiral Model); Project Management Process (Phases of Management Process, Metrics, Measurement and Models); Software Configuration Management Process (Configuration Identification, Change Control, Status Accounting and Auditing); Process Management Process (Building Estimation Models, Process Improvement and Maturity).</p> <p>SOFTWARE REQUIREMENTS ANALYSIS AND SPECIFICATION : Software Requirements (Need for SRS, Requirement Process); Problem Analysis (Analysis Issues, Informal Approach, Structured Analysis, Object-Oriented Modeling, Other Modeling Approaches, Prototyping, Requirement Specification (Characteristics of an SRS, Components of an SRS, Specification Languages, Structure of a Requirement Document); Validation (Requirement Reviews, Other Methods); Metrics (Size Measures, Quality Metrics).</p>	12	---
Section-II		
<p>FUNCTION-ORIENTED DESIGN : Design Principles (Problem Partitioning and Hierarchy, Abstraction, Modularity, Top-Down and Bottom-Up Strategies); Module-Level Concepts (Coupling, Cohesion); Design Notation and Specification (Structure Charts, Specification); Structured Design Methodology (Restate the Problem as a Data Flow Diagram, Identify the Most Abstract Input and Output Data Elements, First-Level Factoring, Factoring the Input, Output, and Transform Branches, Design Heuristics, Transaction Analysis, Discussion); Verification (Design Reviews, Automated Cross-Checking); Metrics (Network Metrics, Stability Metrics, Information Flow Metrics).</p> <p>DETAILED DESIGN: Module Specifications (Specifying Functional Modules, Specifying Classes); Detailed Design (PDL, Logic/Algorithm Design, State Modeling of Classes), Verification (Design Walkthroughs, Critical Design Review, Consistency Checkers); Metrics (Cyclomatic Complexity, Data Bindings, Cohesion Metric).</p>	12	----
Section-III		
<p>CODING : Programming Practice (Top-Down and Bottom-Up, Structured Programming, Information Hiding, Programming Style, Internal Documentation, Verification (Code Reading, Static Analysis, Symbolic Execution, Proving Correctness, Code Inspections or Reviews, Unit Testing); Metrics (Size Measures, Complexity Metrics, Style Metrics).</p> <p>TESTING : Testing Fundamentals (Error, Fault and Failure, Test Oracles, Top-Down and Bottom-Up Approaches, Test Cases and Test Criteria, Psychology of Testing); Functional Testing (Equivalence Class Partitioning, Boundary Value Analysis, Cause-Effect Graphing, Special Cases); Structural Testing (Control Flow – Based Criteria, Data Flow –</p>	12	----

Based Testing, An Example, Mutation Testing, Test Case Generation and Tool Support); Testing Object-Oriented Programs (Issues in Testing Classes, State-Based Testing, Incremental Testing for Subclasses); Testing Process (Comparison of Different Techniques, Levels of Testing, Test Plan, Test Case Specifications, Test Case Execution and Analysis);		
Section-IV		
PROJECT MANAGEMENT:		
PLANNING A SOFTWARE PROJECT : Cost Estimation, Uncertainties in Cost Estimation Building Cost Estimation Models, On Size Estimation, COCOMO Model, Project Scheduling, Average Duration Estimation, Project Scheduling and Milestones, Staffing and Personnel Planning (Rayleigh Curve, Personnel Plan, Team Structure ; Software Configuration Management Plans; Quality Assurance Plans (Verification and Validation (V&V), Inspections and Reviews); Project Monitoring Plans (Time Sheets, Reviews, Cost-Schedule-Milestone Graph, Earned Value Method, Unit Development Folder); Risk Management ,Risk Management overview Risk Assessment, Risk Control.	12	----
Total	48	

Management Information System		
		Total Hrs : 32
Topics	Theory	Prac.
Section I		
INTRODUCTION to Systems and Basic Systems Concepts, Types of Systems, The Systems Approach, Information Systems: Definition & Characteristics, Types of Information, Role of Information in Decision – Making, Sub – Systems of an information system	8	--
Section II		
AN OVERVIEW OF MANAGEMENT INFORMATION SYSTEM: Definition & Characteristics, Components of MIS, Frame Work for Understanding MIS: Robert Anthony's Hierarchy of Management Activity, Information requirements & Levels of Management, Simon's Model of decision – Making, Structured Vs Un-structured decisions, Formal Vs. Informal systems.	8	--
Section III		
DECISION MAKING: Decision-Making, Simon's Model of Decision-Making, Types of Decisions (Purpose of Decision-Making, Level of Programmability, Knowledge of Outcomes); Methods for Choosing Among Alternatives (Decision Theory or Decision Analysis, Utility, Decision Tree, Optimization Techniques). Business Intelligence, Role of BI. DECISION SUPPORT SYSTEM: Introduction of DSS, Characteristics & Objectives, Level of Decision support System, Role of Decision support System & application, Components of DSS.	8	--
Section IV		
DEVELOPING INFORMATION SYSTEMS: Analysis & Design of Information Systems: Implementation & Evaluation, Pitfalls in MIS Development. Functional MIS: A Study of Marketing, Personnel, Financial and Production MIS. ENTERPRISE RESOURCES PLANNING (ERP): Features, selection criteria, merits, issues and challenges in Implementation - Supply Chain Management (SCM): Features, Modules in SCM - Customer Relationship Management (CRM): Phases. Knowledge Management and e-governance	8	--
Total	32	