Post Graduate Diploma in Computer Applications

PROGRAMME GUIDE

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INTRODUCTION

It is a programme for graduate students interested in applications. This course was started for people to learn computer applications in different fields. PGDCA allows students to seek professional computer knowledge. PGDCA gives students the career prospects of becoming System Analyst, Software Engineer, Training Faculty, R&D Scientist, EDP Manager and many more. One can use these PG Diplomas with their respective bachelor's degree to acquire jobs that require both computer and specific knowledge (biology/statistics/chemistry/business).

ACADEMIC OBJECTIVES

- Aims at preparing graduates to handle the computers in large industries.
- Students will be trained in the latest trends of Application Development, Programming Languages and Database Management.
- PGDCA equips students with skills required for high-end applications in IT.

PROGRAMME CODE: 1924

DURATION OF THE PROGRAMME:

Minimum Duration **1** Year

Maximum Duration **3** years

MEDIUM OF INSTRUCTION/ EXAMINATION

Medium of instruction and Examination shall be **English**.

COURSE CODE	COURSE TITLE	Cr.	CA	ETE(Th.)	ETE(Pr.)
Scheme					
TERM 1					
DCAP401	FOUNDATIONS OF COMPUTER PROGRAMMING	4	20	60	20
DENG401	ADVANCED COMMUNICATION SKILLS	4	20	80	0
DMGT409	BASIC FINANCIAL MANAGEMENT	4	20	80	0
DCAP402	DATABASE MANAGEMENT SYSTEMS	4	20	60	20
DCAP403	OPERATING SYSTEM	4	20	80	0
TERM 2					
DCAP404	OBJECT ORIENTED PROGRAMMING	4	20	60	20
DCAP405	SOFTWARE ENGINEERING	4	20	60	20
DCAP406	COMPUTER NETWORKS	4	20	80	0
DCAP407	DATA STRUCTURE	4	20	60	20
DCAP408	WEB PROGRAMMING	4	20	60	20
TOTAL CREDITS		**40**			

Course Code:	D	C	A	P	4	0	1	Course Title:	**FOUNDATIONS OF COMPUTER PROGRAMMING**

WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	20	60

COURSE CONTENTS:

Sr. No.	Topics
1.	**Introduction:** ANSI C standard, Overview of Compiler and Interpreters, Structure of C Program ,Programming rules, Execution
2.	**Basics-The C Declarations:** C Character Set, keywords, **:** Identifiers, data types, operators, constants and variables **Operators & Expressions**
3.	**Input/ Output in C:** Formatting input & output functions.
4.	**Decision making statements** – if, else if **Control Statements:** For, do while, while. Control transfer statements - break, continue.
5.	**Arrays and Strings**: Defining arrays; I/O of arrays, I/O of string data; built-in library functions to manipulate strings, array of strings
6.	**Pointer**: Introductions, Features, Declaration, Pointers and Arrays, pointers to pointers ,Pointers and strings, Void Pointers
7.	**Functions:** Defining and accessing a functions, passing arguments – call by value, function prototypes, recursive functions **Storage Classes:** Storage classes and their usage
8.	**Structures & Unions:** Defining and processing structures, array of structures, nested structures, Unions & difference from Structures
9.	**Files:** Opening, reading, writing & Closing file
10.	**Additional In C:** Dynamic memory allocation, Memory models, Linked List

LABORATORY WORK:

1. Implementation of C Programming Concepts (Operators, Data types, Control Statements, Functions, Arrays, Strings, Structures, Union, Pointers, File Handling)

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Ashok N. Kamthane, "Programming with ANSI & Turbo C", Pearson Education, Year of Publication: 2008
2. Byron Gottfried , "Programming With C", Tata McGraw Hill Publishing Company Limited, New Delhi
3. B.W. Kernighan and D.M. Ritchie, "The C Programming Language", Prentice Hall of India, New Delhi
4. E.Balagurusamy , "Programming in ANSI C ", Tata McGraw Hill Publishing Company Limited, New Delhi.
5. Behrauz A.Foruzan & Richard F.Gilberg , " Computer science – A structure programming approach Using C ", Thomson Asia , 2001.

Course Code:	D	E	N	G	4	0	1	Course Title:	**ADVANCED COMMUNICATION SKILLS**

WEIGHTAGE	
CA	**ETE (Th.)**
20	**80**

COURSE CONTENTS:

Sr. No.	Topics
A	**Speaking Skills** ---to enhance the basic speaking skills, one needs apt language and the correct pronunciation. • Simple rules of pronunciation and intonation • Formal oral presentations--- Power point presentations or presentations using other visual aids followed by actual practice of it. **Interview Skills**—[types of interviews , employer's expectations, types of questions, some standard questions , answering techniques, mock interviews] **Working with Customers**--- essential speaking elements needed to communicate with the customers—[apt questions to determine the context, apt responses to put them at ease, apt responses to acknowledge their efforts, using listener cantered language , asking questions to understand their problems , establish rapport , denying requests, coping with angry customers. **Improving Informal Communication**—speaking persuasively, negotiating effectively, managing conflicts. Formal and regularly used expressions in given situations **Group Discussions**---- a detailed briefing of do' s and don'ts followed by GD's based on topics relevant to their field. Kinds of GD's—to convey information or to instruct or solve problems or to take decisions
B	**Reading Skills—**skills we need to read successfully **Reading Strategies / Techniques / Types:** equipped with separate and adequate reading passages to practice the skill **Comprehension of Written Texts :** selecting information, identifying topic –shift, cause –effect, point of view [the texts are articles / editorials etc., from varied streams of subjects] **Aesthetic Reading Skill-** poem-- "Raisin In the Sun"– Langston Hughes--"ways to kill a Man"—Edwin Brock
C	**Writing Skills** – to reinforce the grammatical structures Grammar – Subject – Verb agreement, Basic sentence patterns, Conditional sentences, Subordinating Conjunctions, Correlative Conjunctions, One Word Substitutes.
D	**Writing skills --**to enhance formally structured effective official writing • Understanding Reports and Proposals • Types of reports • Structure and Layout of a Formal Report—writing the beginning / the body / end matter • Business Reports • Writing Short Reports • Proposal Writing and Process Description • Technical Proposals • Writing Proposals • Supplementary Parts / Appended Parts • Citing sources

READINGS: SELF LEARNING MATERIAL.

Course Code:	D	M	G	T	4	0	9	Course Title:	**BASIC FINANCIAL MANAGEMENT**

WEIGHTAGE	
CA	ETE (Th.)
20	80

COURSE CONTENTS:

Sr. No.	Topics
1.	Meaning, Objectives and Scope of Financial Management
2.	**Finance Functions:** Investment, Financing, Liquidity & Dividend Decisions, Risk & Return Trade Off.
3.	**Sources of Finance:** Long term, Medium term & short term; Time Value of Money: Basic Concepts
4.	**Cost of Capital:** Concept and its significance, measurement of cost of capital of various sources of funds. Weighted average cost of capital.
5.	**Capital Structure Decision:** Understanding debt and equity.
6.	Theories of Capital Structure, Optimum Capital Structure.
7.	**Capital Budgeting:** Analytical study of various methods of Capital Budgeting.
8.	**Working Capital:** Concept and Significance, Determining working capital requirements; Basics of receivables, Inventory and Cash Management.
9.	**Dividend Policy:** Determinants of Dividend Policy, Theories of dividend and Forms of dividend.
10.	Break Even Analysis.

READING: SELF LEARNING MATERIAL

ADDITIONAL READINGS:

1. Shrivastava Rajiv and Mishra Anil, Financial management, Oxford Publications, 2009.
2. Sharan Vyupkesh, Fundamentals of Financial Management, Pearson Education, 2009.
3. Reddy G. Sudarshana, Financial Management, Principles and Practice, 2008.
4. Chandra, Prasana, Financial Management, Tata McGraw Hill, 7e.

Course Code:	D	C	A	P	4	0	2	Course Title:	**DATABASE MANAGEMENT SYSTEMS**

COURSE CONTENTS:

	WEIGHTAGE		
	CA	ETE(Pr.)	ETE (Th.)
	20	20	60

Sr. No.	Topics
1.	**Database Fundamentals:** Database systems, Database Architecture **Relational Model**, Structure of Relational databases, fundamental, additional and extended relational algebra operations
2.	**SQL:** Data Definition, datatypes, schema definition, Basic structure of SQL Queries, Creating tables, DML operations, DDL commands for creating and altering, Set Operations, Aggregate Functions, NULL values
3.	**Advanced SQL:** Subqueries, Nested subqueries, Complex queries, Views, Joined relations, Integrity constraints, Authorization, DCL Commands, Embedded SQL, Dynamic SQL
4.	**Relational Languages:** Tuple Relational calculus, Domain relational calculus, Query by Example **Database design and ER model:** Overview of Design process, Entity relationship model, constraints, ER Diagrams, ER Design issues, Weak entity sets, extended ER features
5.	**Relational Database Design:** Features, Atomic Domains and first normal form, Functional dependency theory decomposition using functional dependencies, decomposition using Multivalued dependencies, database design process **Normalization:** 1NF, 2NF, 3NF, BCNF, 4NF, 5NF.
6.	**Transaction Management:** Concept of Transaction, Transaction State, Implementation of atomicity and durability, concurrent execution, Serializability, Recoverability, Implementation of Isolation, testing for Serializability.n **Concurrency Control**: Lock based protocols, Timestamp based protocols, Validation based protocols, Deadlock handling, Insert and Delete operations, Weak levels of consistency
7.	**Recovery system:** Failure classification, storage structure, recovery and atomicity, log-based recovery, recovery with concurrent transactions, buffer management, failure with loss of non-volatile storage
8.	**Query Processing:** Overview, measures of query cost, selection operation, sorting, join operation, evaluation of expressions **Query Optimization:** Transformation of relational expressions, estimating statistics of expression results, Choice of evaluation plans
9.	**Parallel Databases:** I/O parallelism, Interquery parallelism, Intraquery parallelism, Interoperation parallelism, Interoperation parallelism
10.	**Application development and administration**: web interfaces to databases, performance tuning

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Author: Silberschatz–Korth–Sudarshan: Database System Concepts, Fourth Edition, Title: Database System Concepts, Publishers: Tata McGraw Hill.
2. Elmasri & Navathe, Fundamentals of Database systems, Addison & Weisely, New Delhi.
3. C. J. Date, Database Systems, Prentice Hall of India, New Delhi.
4. Martin Gruber, Understanding SQL, BPB Publication, New Delhi.
5. Val Occardi, Relational Database: Theory & Practice, BPB Publication, New Delhi.
6. Ivan Bayross, SQL, PL/SQL The Programming Language of Oracle, BPB Publication.

Course Code:	**D**	**C**	**A**	**P**	**4**	**0**	**3**	Course Title:	**OPERATING SYSTEM**

WEIGHTAGE	
CA	**ETE (Th.)**
20	**80**

COURSE CONTENTS:

Sr. No.	Topics
1.	**Introduction:** Operating system Meaning, Supervisor & User mode, operating system operations & Functions, Types of OS: Single-processor system, multiprogramming, Multiprocessing, Multitasking, Parallel, Distributed, RTOS etc.
2.	**Operating System Structure:** OS Services, System Calls, System Programs, OS Structures, layered structure Virtual machines,
3.	**Processes**: Process Concept, PCB, Operation on Processes, Cooperating Processes, Inter process Communication, Process Communication in Client Server Environment. **Threads:** Concept of Thread, Kernel level & User level threads, Multithreading, Thread Libraries, Threading Issues
4.	**Scheduling:** scheduling criteria, scheduling algorithms, Type of Scheduling: Long term, Short term & Medium term scheduling, multi-processor scheduling algorithm, thread scheduling,
5.	**Process Synchronization:** Critical Section problem, semaphores, monitors, Deadlock characterization, Handling of deadlocks - deadlock prevention, avoidance, detection, recovery from deadlock.
6.	**Memory Management**: Logical & Physical Address space, Swapping, Contiguous memory allocation, paging, segmentation, Virtual memory, demand paging, Page replacement & Page Allocation algorithms, thrashing, Performance issues
7.	**File Management:** File concepts, access methods, directory structure, file system mounting, file sharing, protection, Allocation methods, Free space Mgt., Directory Implementation.
8.	**I/O & Secondary Storage Structure:** I/O H/W, Application I/O Interface, Kernel I/O subsystem, Disk Scheduling, disk management, swap-space management, RAID structure.
9.	**System Protection:** Goals of protection, Access matrix and its implementation, Access control and revocation of access rights, capability-based systems
10.	**System Security:** Security problem, program threats, system and network threats, cryptography as a security tools, user authentication, implementing security defences, firewalling to protect systems and networks. Case studies Windows OS, Linux or any other OS

READINGS: SELF LEARNING MATERIAL.
ADDITIONAL READINGS:

1. Silberschatz, Gagne & Galvin, "Operating System Concepts", John Wiley & Sons, Seventh Edition or Latest
2. A.S. Tanenbaum : Operating System : Design and Implementation, Prentice Hall of India.
3. Milankovic, Operating system, Tata Macgraw Hill, New Delhi.
4. Stalling, W., "Operating Systems", 2nd edition, Prentice Hall.
5. Deitel H. M., "Operating Systems, 2nd edition, Addison Wesley.

Course Code:	D	C	A	P	4	0	4	Course Title:	**OBJECT ORIENTED PROGRAMMING**

WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	**20**	**60**

COURSE CONTENTS:

Sr. No.	Topics
1.	**Review:** Review of basic concepts of object-oriented programming & Introduction of OOP Languages, Comparison between procedural programming paradigm and object-oriented programming paradigm.
2.	**Beginning with OOP Language:** Review of Tokens, Expressions, Operators & Control Structures. Scope Resolution operator, member dereferencing operator, Reference Variables Review of Functions, Function Overloading, Inline Functions, Default Arguments
3.	**Classes & Objects:** specifying a class, Defining member functions, creating class objects, accessing class Members. Access specifiers – public, private, and protected Classes, its members, objects and memory allocation
4.	Static members, the const keyword and classes, the static objects. Friend Function & its usage Empty classes, nested classes, local classes
5.	**Constructors & Destructors:** Need for constructors and destructors, copy constructor, dynamic constructors, Destructors, constructors and destructors with static members
6.	**Operator Overloading & Type Conversion:** Defining operator overloading, rules for overloading operators, Overloading of unary operators and various binary operators with friend functions and member functions Type conversion – basic type to class type, class type to basic type, class type to another class type
7.	**Inheritance:** Introduction, defining derived classes, forms of inheritance, Ambiguity in multiple and multipath inheritance, virtual base class, Overriding member functions, order of execution of constructors and destructors Virtual functions & Polymorphism: virtual functions, pure virtual functions, abstract classes, introduction to polymorphism
8.	**Pointers & Dynamic Memory Management:** understanding pointers, accessing address of a variable, declaring & initializing pointers, Pointer to a pointer, pointer to a function, dynamic memory management new and delete operators, this pointer
9.	**Console I/O:** concept of streams, hierarchy of console stream classes, Unformatted I/O Operations, Managing output with manipulators
10.	**Working with Files:** Opening, Reading, Writing, Appending, Processing & Closing difference type of files, Command line Arguments

LABORATORY WORK:

Sr. No.	Topics
1.	Implementation of Concepts of OOP using C++ covered in the syllabus

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Robert Lafore, "Object Oriented Programming with C++", Galgotia.
2. Author: Herbert Schildt,Title: Teach Yourself C++,Publishers: Tata Mc Graw Hill,Year of Publication: 2005.
3. J Marget A. Ellis and Bjarne Stroustrup ,The Annotated C++ reference manual, Addison Wesley New York.
4. Waite Group Lafore R.,Object oriented programming in C++, Waite Group Lafore R.
5. Lippman F. B.C++ Primer, Addison Wesley
6. E. Balagurusamy, "Object Oriented Programming with C++", Tata McGraw Hill

Course Code:	D	C	A	P	4	0	5	Course Title:	**SOFTWARE ENGINEERING**

	WEIGHTAGE		
	CA	**ETE (Pr.)**	**ETE (Th.)**
	20	**20**	**60**

COURSE CONTENT:

Sr. No.	Topics
1.	**Introduction to Software Engineering:** The Evolving Role of Software, Software, Software Myths.
2.	**A generic view of Process:** Software Engineering-A Layered Technology, A process framework, The Capability Maturity Model Integration, Process Patterns, Process Assessment.
3.	**Process Models :** Prescriptive Models, The Waterfall model, Incremental Process Models : The Incremental model, The RAD model Evolutionary Process models: Prototyping, The Spiral model, The Concurrent Development model, A final comment on evolutionary Processes.
4.	**An Agile view of Process :** What is Agility, Agile Process models : XP, ASD, DSDM, Scrum, Crystal, FDD, AM **Requirements Engineering :** A Brigade to design & construction, Requirements Engineering tasks: Inception, Elicitation, negotiation, Specification, Validation, Requirements Management .
5.	**Software Engineering Practice :** The Essence of practice, Core Principles, Planning practices, Modelling practices: Analysis modelling principles, Design modelling principles Construction practice : Coding principles and concepts, Testing principles **Design Engineering:** Design process & Design Quality. **Design Concepts:** Abstraction ,Architecture, patterns, Modularity, Information hiding, Functional independence, Refinement, Refactoring, Design Classes
6.	**System Engineering :** The System Engineering Hierarchy: System Modelling, System Simulation, System modelling: Hatley-Pirbhai modelling, System modelling with UML **Creating an Architectural Design:** Data design: Data design at the Architectural level & component level, Architectural Design: Representing the system in Context, Defining Archetypes, Refining the Architecture into components, Describing installations of the system.
7.	**Testing Strategies: -** Testing strategies for conventional software, test strategies for object-oriented software, validation testing, system testing. **Requirements Engineering:** A Bridge to Design and Construction, Requirements Engineering Tasks: Inception, Elicitation, Elaboration, Negotiation, Specification, Validation, Requirements Management.
8.	**Testing Tactics**: Black-box testing & white box testing, flow-graph testing, equivalence partitioning, Boundary value analysis, Fault based testing. **Building the Analysis Model:** Requirements Analysis: Overall objective and philosophy, Analysis rules of Thumb, Domain Analysis, Analysis modelling approaches. Data modelling concepts: Data objects, Data attributes, Relationships, Cardinality and Modality
9.	**Design Engineering :** Design Process and Design quality, Design concepts: Abstraction, Architecture, patterns, Modularity, Information hiding, Functional independence, Refinement, Refactoring, Design classes
10.	**Creating an Architectural Design :** Data design: Data design at the Architectural level and Component level, Architectural Design: Representing the system in Context, Defining Archetypes, Refining the Architecture into Components, Describing installations of the system

LABORATORY WORK:

Sr. No.	Topics
1.	Various Tools available for CASE (Computer Aided Software Engineering).
2.	Practical to show how to create an information gathering document.
3.	Finalizing the SRS Document based upon the information gathered and analysis of the same.
4.	How to Create Use Cases.
5.	How to Create ER Diagrams.
6.	Developing Test Cases and Test Plan.

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. R.S. Pressman, Title: Software Engineering – A Practitioner's Approach Publishers: McGraw Hill, 6th edition
2. P. Jalote, "An Integrated approach to Software Engineering", Narosa.
3. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill, 1997.
4. Software Engineering by Ian Sommerville, Pearson Education.

Course Code:	D	C	A	P	4	0	6	Course Title:	**COMPUTER NETWORKS**

COURSE CONTENTS:

WEIGHTAGE	
CA	ETE (Th.)
20	80

Sr. No.	Topics
1.	**Introduction to Computer Networks:** uses of computer networks,
2.	Network hardware, network software, Reference models, Example networks
3.	**Physical Layer :** Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites
4.	Public Switched Telephone Network, The Mobile Telephone System, Cable television
5.	**Data Link Layer:** Design Issues, Error Detection and Correction
6.	Elementary data link protocols, Sliding – Window protocols, Protocol verification, Example Data Link Protocols
7.	**The Medium Access Control Sub Layer**: The Channel Allocation Problem
8.	Multiple Access Protocols, Ethernet, wireless LANs, Bluetooth, Data Link Layer Switching.
9.	**Network Layer:** Design Issues, Routing Algorithms, Internetworking, network Layer in the Internet, Congestion Control Algorithms, Quality of service
10.	**Transport Layer:** Transport Service, Elements of Transport Protocols, The internet transport protocols: UDP,TCP **Application Layer:** DNS ,E-mail, The World Wide Web, Multimedia ,**Network Security** - Cryptography

READINGS: SELF LEARNING MATERIAL.
ADDITIONAL READINGS:
1. A.S. Tananbaum, "Computer Networks", Pearson Education, Delhi, Fourth edition, Year of Publication: 2009
2. Behnouz A. Forouzan, "Data Communication and networking", 2nd Ed. Update, Tata McGraw Hills 2003
3. Black U, "Computer Networks-Protocols, Standards and Interfaces", PHI 1996
4. Comer E. Doughlas, "Computer Networks and Internets", 2nd Ed., Pearson, 2000
5. W. Stallings, "Data and Computer Communications", 7th Ed., Pearson, 2002.
6. Laura Chappell (Ed), "Introduction to Cisco Router Configuration", Techmedia, 99

Course Code:	**D**	**C**	**A**	**P**	**4**	**0**	**7**	Course Title:	**DATA STRUCTURE**

WEIGHTAGE		
CA	**ETE (Pr.)**	**ETE (Th.)**
20	**20**	**60**

COURSE CONTENTS:

Sr. No.	Topics
1.	**Basic concepts and notations,** data structures and data structure operations
2.	**Complexity Analysis:** Mathematical notation and functions, algorithmic complexity and time space trade off, **Big O Notation**, The best, average & Worst cases analysis of various algorithms.
3.	**Arrays:** Linear & Multidimensional Arrays, Representation & traversal
4.	**Pointers**, Array Pointers, **Records** and Record Structures, Representation of Records in Memory; Parallel Arrays
5.	**Linked list:** representation, traversal, searching, Insertion, deletion of linked list. **Two way / multi linked structures,** Header Lists, Circular Lists
6.	**Stacks:** Basic operation of Stack, Memory Representation, Traversal. **Queues:** Operations, Representation & Types.
7.	**Recursion:** Definition, Function Call & Recursion implementation, Anatomy of Recursive Call, Complexity issues
8.	**Trees:**- Definition, Representation in memory.
9.	**Binary trees:** Binary tree traversal, Insertion, Deletion & Searching
10.	**Binary Search Trees:** Search, Insertion, deletion **Intro to Heaps**

LABORATORY WORK:

1. Implementation of Arrays, Linked Lists, Stacks, Recursion, Trees and Heaps using C/C++

READINGS: SELF LEARNING MATERIAL.

ADDITIONAL READINGS:

1. Seymour Lipschutz, "Schaum Outline Series", Tata McGraw Hill, New Delhi, Year of Publication: 2006.
2. Mark Allen Weises, Data Structures & Algorithmic Analysis in C, Pearson Education.
3. Adam Drozdek, Data Structure & Algorithms in C++. Thomson.
4. Kruse, Data Structures & Program design, Prentice Hall of India, New Delhi.
5. Tenenbaum, Augenstein, & Langsam, Data Structures using C and C++, Prentice Hall of India, New Delhi.
6. Sorenson and Tremblay : An Introduction to Data Structures with Algorithms.

Course Code:	D	C	A	P	4	0	8	Course Title:	**WEB PROGRAMMING**

WEIGHTAGE		
CA	ETE (Pr.)	ETE (Th.)
20	20	60

COURSE CONTENTS:

Sr. No.	Topics
1.	**Internet Fundamentals**: Introduction to Internet, Web browser, web page, website, homepage, hyperlinks, hypermedia, HTTP, WWW, Web server, Client server architecture model for web requests, URL
2.	**Creating static web pages:** HTML document structure, singular and paired tags, test formatting, hyperlinks, adding images, audio and video, creating lists, tables, forms, frames, using multiple windows for web pages
3.	**Cascading Style Sheets:** Style tag, DIV and SPAN, Internal and External stylesheets, Creating and using Classes, applying style on text and images
4.	**Scripting Language** Java Script programming, Data Types, Variables, Arrays, Operators. Loops, functions, Dialog boxes, String Manipulation functions, Using Timer in web page. Setting and Getting date object in a web page.
5.	**DOM Model**. Events handling through JavaScript, How to use forms in JavaScript
6.	**ASP:** introduction to asp, installing IIS, ASP variable, ASP operators, conditional, loops and case statements and arrays
7.	**ASP Web Forms:** Introduction to CGI, Client side and server side scripting, building and processing web forms
8.	**ASP Objects**: Response, Request, Server, Session, Application. Purpose of Global.asa file, #include, Recordset objects
9.	**ASP Cookies and Caching** Procedures, Cookies, ASP file system, send e-mail, **Caching**: page, data, fragment, output.
10.	**Database Connectivity:** Open and Close a connection, reading from the database, inserting, deleting and updating the database records Building Database Applications Using ActiveX Data Objects

READINGS: SELF LEARNING MATERIAL.
ADDITIONAL READINGS:

1. Teach Yourself ASP in 21 Days: Sams publishing.
2. Author: Bayros Ivan, Title: Web Enabled Commercial Application Development Using HTML, DHTML, JavaScript, Publishers: BPB publications.
3. Teach Yourself HTML 4 With XML, DHTML and Java Script - Stephine Cottrell Bryant.
4. An Introduction to Apache : Tata McGraw Hills, New Delhi.
5. HTML Black Book: Galgotia Publications.