


**PGDCA SYLLABUS (1st Sem)**

Course Code	Course Title	Load Allocation			Marks Distribution		Credits
		L	T	P	Internal	External	
<b>PDCA-101</b>	Computer Fundamentals	4	-	-	40	60	4
<b>PDCA-102</b>	Programing in C++	4	-	-	40	60	4
<b>PDCA-103</b>	Computer Operating System	4	-	-	40	60	4
<b>PDCA-104</b>	RelationalDatabase Management System	4	-	-	40	60	4
<b>PDCA-105</b>	Communication and Soft Skills	3	-	-	40	60	3
<b>PDCA-106</b>	Computer Fundamental Lab	-	-	4	60	40	2
<b>PDCA-107</b>	Programmming in C++ Lab	-	-	4	60	40	2
<b>PDCA-108</b>	RDBMS Lab	-	-	4	60	40	2
	<b>TOTAL</b>	<b>19</b>		<b>12</b>	<b>380</b>	<b>420</b>	<b>25</b>

Course Code	Course Title	Load Allocation			Marks Distribution		Credits
		L	T	P	Internal	External	
<b>PDCA-201</b>	Programming in JAVA	4	-	-	40	60	4
<b>PDCA-202</b>	Web Technologies	4	-	-	40	60	4
<b>PDCA-203</b>	Software Engineering	4	-	-	40	60	4
<b>PDCA-204</b>	Data Communication and Networks	4	-	-	40	60	4
<b>PDCA-205</b>	JAVA LAB	3	-	-	40	60	3
<b>PDCA-206</b>	Web Technology Lab	-	-	4	60	40	2
<b>PDCA-207</b>	PROJECT	-	-	6	120	80	2
	<b>TOTAL</b>	<b>19</b>		<b>10</b>	<b>380</b>	<b>420</b>	<b>24</b>

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## **PDCA-101 COMPUTER FUNDAMENTALS**

### **Objectives:**

This course will enable the student to gain an understanding of the core concepts and technologies which constitute Information Technology.

### **Expected Outcome:**

The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology.

### **SECTION- A**

Computer Fundamentals: Block structure of a computer, characteristics of computers, problem solving with computers, generations of computers, and classification of computers on the basis of capacity, purpose, and generation. Number System: binary, decimal, hexadecimal, and octal systems, conversion from one system to the other, representation of characters, integers and fractions. Binary Arithmetic: Addition, subtraction and multiplication. (9)

### **SECTION-B**

Output Units: Keyboard, Mouse, Monitor (CRT and LCD): Light pen, joystick, Mouse, Touch screen, OCR, OMR, MICR Memory Types: Magnetic core, RAM, ROM, Secondary, Cache, Bubble Memory, Floppy disk, hard disk, compact disk, tapes. Memory Input and Printers: Impact, non-impact, working mechanism of Drum printer, Dot Matrix printer, Inkjet printer and Laser printer. Computer languages: Machine language, assembly language, higher level language, 4GL. Introduction to Compiler, Interpreter, Assembler, Assembling, System Software, Application Software. (9)

### **SECTION- C**

Operating system: Batch, multi-programming, time sharing, network operating system, on-line and real time operating system, Distributed operating system, multi-processor, Multi-tasking. Personal Productivity Software: Word processing: Editing features, formatting features, saving, printing, table handling, page settings, spell-checking, macros, mail-merge, and equation editors. Spreadsheet : Workbook, worksheets, data types, operators, cell formats, freeze panes, editing features, formatting features, creating formulas, using formulas, cell references. Presentation Graphics Software: Templates, views, formatting slide, slides with graphs, animation, using special features, presenting slide shows. (9)

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## **SECTION -D**

Computer Network and Communication: Network types, network topologies, network communication devices, physical communication media. Internet and its Applications: E-mail, TELNET, FTP, World Wide Web, Internet chatting, Intranet, Extranet, Gopher, Mosaic, WAIS. Security management tools: PC tools, Norton Utilities, Virus, worms, threats, virus detection, prevention and cure utilities, Firewalls, Proxy servers. (9)

### **Suggested Readings/ Books:**

1. Rajaraman, Fundamentals of Computers, Fourth edition, Prentice Hall India Pvt. Limited, 2006.
2. Computer Fundamental, P.K Sinha, 4th Edition, BPB PUBLICATION 2007.
3. Fundamentals of Information Technology, Chetan Srivastva, Third edition, Kalayani Publishers, 2008.
4. Computers, Larry long & Nancy long, 12<sup>th</sup> edition, Prentice Hall, 2005.

## **PDCA-102 PROGRAMMING IN C++**

### **Objective:**

The objective of this course is to help the students in finding solutions to various real life problems and converting the solutions into computer program using C language (structured programming).

### **Expected Outcome:**

Students will learn to write algorithm for solutions to various real-life problems. Converting the algorithms into computer programs using C language.

## **SECTION-A**

Fundamentals of C: I/O statements, Assignment Statements, Constants, Variables, Operators and Expressions, Standards and Formatted statements, Keywords, Data Types and Identifiers. Control Structures: Introduction, Decision making with if – statement, if-else and Nested if, while and do-while, for loop. Jump statements: break, continue, goto, switch Statement (10)

## **SECTION-B**

Structure and Union: Declaration of structure, Accessing structure members, Structure Initialization Overview of OOP: Classes & Functions, Scope Resolution Operator, Private and Public Member Functions, Nesting of Member Functions. Creating Objects, Accessing class data members, Accessing member functions Arrays: Introduction to Arrays, Array Declaration, Single



and Multidimensional Array, Memory Representation, Matrices, Strings, String handling functions. (10)

### **SECTION-C**

Inheritance - Extending Classes Concept of inheritance, Base class, Derived class, Defining derived classes. Types of Inheritance Polymorphism: Definition, early Binding, Polymorphism with pointers, Virtual Functions, late binding, pure virtual functions. (10)

### **SECTION-D**

Pointers: Introduction to Pointers, Address operator and pointers, Declaring and Initializing pointers, Assignment through pointers. File Management in C++: Defining & opening a file, closing a file, I/O operations on file, error handling during I/O operations, Random Access Files.

### **Suggested Readings/ Books:**

1. Balagurusamy, "Programming in C", 5<sup>th</sup> Edition, Tata McGraw-Hill Education, 2007
2. Yashavant Kanetkar, "Let us C", 10<sup>th</sup> Edition, BPB publication, 2010
3. Balagurusamy, "Object Oriented Programming with C++", 3<sup>rd</sup> Edition, Tata McGraw-Hill Education, 2006
4. R. S. Salaria, Mastering Object-Oriented Programming with C++, Salaria Publishing House, 2011.
5. Lafore R, "Object Oriented Programming in C++", 4th Edition Waite Group, 2002.

### **PDCA-103 Operating System**

#### **Objective:**

The objective of this course is to help the students to get detailed Knowledge of the various functions which are being performed by the operating system.

#### **Expected Outcome:**

Students will learn various techniques and algorithms used by operating systems to perform its functions.

### **SECTION-A**

INTRODUCTION: - Machine Hardware (Traps and Interrupts, Multimode Execution), Operating System Structure (Operating System Types, Operating System Kernel, the Boot Process).



PROCESS MANAGEMENT :- Process Scheduling, Process State, Scheduling Criteria, Scheduling Algorithms (First-Come First-Served, Shortest Job First, Shortest Remaining Time, Round Robin, Priority, Multilevel feedback Queues) (10)

### **SECTION-B**

INTERPROCESS COMMUNICATION AND SYNCHRONIZATION: - Interprocess Communication, Process Synchronization (Critical Section, Interrupt Disabling, Test and Set Instruction, Write a Program Instruction, Wait and Signal, Semaphores) Deadlock (Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock). MEMORY MANAGEMENT: - Single Absolute Partition, Single Relocatable Partition, Multiprogramming, and Multiple Partitions (Multiple Fixed Partitions, Multiple Variable Partitions (Partition Selection Algorithms), Paging, Segmentation, Segmentation with Paging, Page and Segment Tables (Associative Memory, Inverted Page Table. (12)

### **SECTION-C**


VIRTUAL MEMORY: - Demand Paging (Locality of Reference, Page Locking, Page Size, Page Replacement Algorithms, Algorithm Performance, Allocation Policies, Working Set), FILE SYSTEM MANAGEMENT: - Directories and Names (Partitions, Per-Process Root Directory, Directory Structure, Directory Entries), Types of File System Objects, File System Functions, Information Types, File System Architecture (Access Methods, Access Control, File Locking, Blocking, Allocation, Free Space). (12)

### **SECTION-D**

DEVICE MANAGEMENT :- Hardware I/O Organization (I/O Control, Port and Memory-Mapped I/O, Module Registers, Busy Wait I/O, Polled I/O, Interrupt I/O, Direct Memory Access (DMA)), Software Organization (Network I/O, Logical I/O, Buffering, Caching, Device Drivers), Devices (Graphics, Text-Based Displays, Storage Disks, Hard-Disk Performance, Hard-Disk Scheduling, Formatting, Raid, RAM Disks). SECURITY: - Authentication (Passwords, Physical Authentication), Prevention, Detection, Correction, Identification, Threat Categories, Program Threats. (10)

### **Suggested Readings/ Books:**

1. William Stalling, "Operating System Internals and Design Principle", edition 6<sup>th</sup>, Pearson Education India, 2009.
2. Peter bears Galvin, "Operating System Principle", Edition 7<sup>th</sup>, Wiley India, 2009
3. J. Harris, "Operating System SCHAUM'S OUTLINE", Special Indian edition,

  
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Tata McGraw Hill. 2008

4. Pramod Chandra," An Introduction to Operating System", Edition 3<sup>rd</sup>, PH, 2010.

### **PDCA-104-RDBMS**

#### **Objective:**

The objective of this course is to help the students to get knowledge about databases its architecture various models.

#### **Expected Outcome:**

Students will be able to develop databases with all the constraints which help in storing and retrieving data easily.

#### **SECTION-A**

An Overview of DBMS and DB Systems Architecture : Introduction to Database Management systems, Data Models, Database System Architecture, Relational Database Management systems, Candidate Key and Primary Key in a Relation, Foreign Keys, Relational Operators, Set Operations on Relations, Attribute domains and their Implementation. The Normalization Process : Introduction, first Normal Form, Partial Dependencies, Second Normal Form, data Anomalies in 2NF Relations, Transitive Dependencies, Third Normal Form. (10)

#### **SECTION-B**

The Entity Relationship Model: The Entity Relationship Model, Entities and Attributes, Relationships, One-One Relationships, Many-to-one Relationships, Normalizing the Model, Table instance charts. Interactive SQL : SQL commands , Data Definition Language Commands, Data Manipulation Language Commands, insertion of data into the tables, Viewing of data into the tables, Deletion operations, updating the contents of the table, modifying the structure of the table, renaming table, destroying tables, Data Constraints, Type of Data Constraint, Column Level Constraint, Table Level Constraint. (12)

#### **SECTION-C**

Viewing The Data : Computations on Table Data, Arithmetic Operators, Logical Operators, Comparison Operators, Range Searching, Pattern Searching, ORACLE FUNCTIONS, Number Functions, Group Functions, Scalar Functions, Data Conversion Functions, Manipulating Dates in SQL , Character Functions, Sub queries and Joins : Joins, Equi Joins, Non Equi Joins, Self Joins, Outer Joins, Sub Queries, Correlated Queries, Using Set Operators:- Union , Intersect, Minus. (10)

  
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#### **SECTION-D**

Views and Indexes : Definition and Advantages Views, Creating and Altering Views, Using Views, Indexed Views, Partitioned views, Definition and Advantages of Indexes, Composite Index and Unique Indexes, Accessing Data With and without Indexes, Creating Indexes and Statistics. Introduction to PL/SQL : Advantage of PL/SQL, The Generic PL/SQL Block, The Declaration Section, The Begin Section, The End Section, The Character set, Literals, PL/SQL Data types, Variables, Constants, Logical Comparison, Conditional Control in PL/SQL, Iterative Control. (12)

#### **Suggested Readings/ Books:**

1. Ramez Elmasri, "Fundamentals of Database Systems", Edition 5<sup>th</sup>, Pearson Education India, 2009
2. JD Ullman, Garcia-Molina, "Database System: The Complete Book", Edition 4<sup>th</sup>, Pearson Education India, 2009
3. S.K Singh, "Database Systems: Concepts, Design and Applications", Edition 2<sup>nd</sup>, Pearson Education India 2008
4. C.J Date, "An Introduction to Database System", Edition 8<sup>th</sup>, Pearson Education India. 2009
5. Ivan Bayross, "Database Concepts & Systems for Students", Edition 3<sup>rd</sup>, Shroff Publishers & Distributors Pvt Limited, 2009.

#### **PDCA-105-Communication Skills**

##### **Objective:**

The objective of this course is to make students understand that both oral & written Communications are equally important.

##### **Expected outcome:**

The students should be comfortable with both Verbal & written communication.

#### **SECTION-A**

Basics of Technical Communication- Functions of Communication-Internal & External Functions, Models-Shannon & Weaver's model of communication, Flow, Networks and Importance, Barriers to Communication, Essential of effective communication (7 C's and Other principles), Non-verbal Communication. (8)

  
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### **SECTION-B**

Basic Technical Writing: Paragraph writing (descriptive, Imaginative etc.), precise writing, Reading and comprehension, Letters – Format & various types. (8)

### **SECTION-C**

Verbal Communication- Presentation Techniques, Interviews, Group Discussions, Extempore, Meetings and Conferences. (8)

### **SECTION-D**

Technical Communication-Dissertation and Thesis, Technical Reports, Instruction Manuals and Technical Descriptions, Creating Indexes. (8)

### **Suggested Readings/ Books:**

1. Loveleen Kaur, "Communication Skills", Satya Pratashan Publication, Edition 2008.
2. M Aihraj Rizvi, "Effective Technical Communication", Tata McGraw hill, Edition 2005.
3. Varinder Kumar Bodhraj, "Business Communication", Kalyani Publishers", Edition 2011.
4. S.P. Dhanavel, "English and Communication Skills for Students of Science and Engineering" (with audio CD.) Orient BlackSwan Publication, 2009

### **(PDCA-106) COMPUTER FUNDAMENTALS LAB**

- 1) [MS-WORD] Creating, opening, closing, saving and editing a word Document.
- 2) [MS-WORD] Insert header and footer in the document.
- 3) [MS-WORD] Create a link between two files using Hyperlink.
- 4) [MS-WORD] Create a mail-merge and add data of 5 recipients.
- 5) [MS-WORD] Protect a document.
- 6) [MS-WORD] Implement macro.
- 7) [MS-POWERPOINT] Create duplicate slides in PowerPoint. Give an example.
- 8) [MS-POWERPOINT] Make a master slide.
- 9) [MS-POWERPOINT] Design a chart of population.
- 10) [MS-POWERPOINT] Insert Animation.
- 11) [MS-POWERPOINT] Insert a background in PowerPoint.
- 12) [MS-EXCEL] How you can filter your data.
- 13) [MS-EXCEL] Sort data in ascending and descending order.
- 14) [MS-EXCEL] To show the use of goal seek
- 15) [MS-EXCEL] To show the use of scenarios.

  
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- 16) [MS-EXCEL] Perform any 5 Date and Time functions.
- 17) [MS-EXCEL] Perform any 5 Math & Trig functions.
- 18) [MS-ACCESS] With the help of Wizard create table having 5 elements.
- 19) [MS- ACCESS] Create a query in design view.
- 20) [MS- ACCESS] Make an admission form using design view in MS-Access.
- 21) [MS- ACCESS] Create a relationship b/w two tables.

**(PDCA-107) C++ LAB**

**[CONTROL STRUTURES]**

- 1) Write a Program to show days of week by using Switch statement.
- 2) Write a Program to print a table using for loop.
- 3) Write a Program to count even and odd numbers
- 4) Write a Program to find number is Palindrome.
- 5) Write a Program to find division of students by using nested-if.

**[ARRAY]**

- 6) Write a Program to print marks, total and average of students using array.
- 7) Write a Program to print a matrix in 2D array.
- 8) Write a Program to sort the elements in ascending order.

**[FUNCTIONS]**

- 9) Write a Program to show the use of friend function.
- 10) Write a Program to show the use of copy constructor.
- 11) Write a Program to show the use of function overloading.
- 12) Write a Program to show the use of virtual function.
- 13) Write a Program of Recursive function.

**[INHERITANCE]**

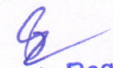

- 14) Write a Program to implement the concept of Single inheritance.
- 15) Write a Program to implement the concept of multilevel inheritance.
- 16) Write a Program to implement the concept of multiple inheritances by ambiguity problem.

**[POLYMORPHISM]**

- 17) Write a Program of unary operator overloading.
- 18) Write a Program of Binary operator overloading.
- 19) Write a Program to access global variables in C++.

**[FILE HANDLING]**

- 20) Write a Program to open, write and close a file.

  
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**(PDCA-108) RDBMS LAB**

**[SQL COMMANDS]**

- 1) Introduction to DBMS.
- 2) To create a table, alter and drop table.
- 3) To perform select, update, insert and delete operation in a table.
- 4) To make use of different clauses viz where, group by, having, order by, union, intersection, set difference.
- 5) To study different constraints.

**[SQL FUNCTION]**

- 6) To use oracle function viz aggregate, numeric, conversion, string function.
- 7) To understand use and working with joins.
- 8) To understand use and working of sub-queries.
- 9) To make use of transaction control statement viz rollback, commit and save point.
- 10) To make views of a table.
- 11) To make indexes of a table.
- 12) To inbuilt SQL function to create database.

**[PL/SQL]**

- 13) Introduction to SQL & PL/SQL
- 14) To implement Cursor on a table.
- 15) To implement trigger on a table
- 16) Creating Procedures and Function.
- 17) To implement control structure.
- 18) To implement Packages.

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## **PDCA-201 Programming in Java**

### **Objective:**

The objective of this course is to help the students in finding solutions to various real life problems and converting the solutions into computer program using OOP language (Java).

### **Expected Outcome:**

Students will learn to write solutions to various real-life problems.

### **SECTION-A**

FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING: - Introduction, Object-Oriented Paradigm, Basic Concepts of Object-Oriented Programming Benefits of OOP, Applications of OOP. How Java Differs from C and C++ (Java character set, Keywords, Identifiers, Literals, Operators, Separators), DECISION MAKING AND LOOPING :- Introduction, The while Statement, The do Statement, The for Statement (Additional features of for loop, Nesting of for loops), Jumps in Loops (Jumping out of a loop, Skipping a part of a loop), Labeled Loops. CLASSES. (10)

### **SECTION-B**

OBJECTS AND METHODS: - Introduction, Defining a Class, Adding Variables, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Inheritance: Extending a Class (Defining a subclass, Subclass constructor, Multilevel inheritance, Hierarchical inheritance), Overriding Methods, Final Variables and Methods, Final Classes, Finalizer Methods.

ARRAYS, STRINGS AND VECTORS: - Arrays, One-Dimensional Arrays, Creating an Array (Declaration of arrays, Creation of arrays, Initialization of arrays, Array length), Two-Dimensional Arrays (Variable size arrays), Strings (String arrays, String methods, String Buffer class), Vectors, Wrapper Classes. INTERFACES: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables. (12)

### **SECTION-C**

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. MANAGING ERRORS AND EXCEPTIONS :- Introduction, Types of Errors (Compile-time error, Run-time error), Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, Using finally Statement, Throwing Our Own Exceptions, Using Exceptions for Debugging. (10)

  
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## **SECTION-D**

APPLET PROGRAMMING :- Introduction, How Applets Differ from Applications, Preparing to Write Applets, Building Applet Code, Applet Life Cycle (Initialization state, Running State, Idle or stopped state, Dead state, Display state), Creating an Executable Applet, Designing a Web Page(Comment Section, Head Section, Body Section), 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. (10)

### **Suggested Readings/ Books:**

1. E Balagurusamy, "Programming with Java", 4<sup>th</sup> Edition 2010.
2. Hebert Schildt, "Java the Complete Reference", 8<sup>th</sup> Edition 2011.
3. Bruce Eckel, "Thinking in Java", Kalyani Publishers", 4<sup>th</sup> Edition 2011.

## **PDCA-202 Web Technologies**

### **Objective:**

This course will enable the student to build and Publish web sites using Dreamweaver, a popular visual web site production and Management program, using HTML, DHTML, CSS and JavaScript. This course will enable the student to build and publish web sites using Dreamweaver, a popular visual Web site production and management program. The intention is for the student to be

### **Expected Outcome:**

1. Identify the entities responsible for implementing mark-up language standards.
2. Code and troubleshoot HTML and XHTML web pages, incorporating CSS and Scripts.
3. Incorporate multimedia (images, animation, sound, and movies) into web pages.
4. Demonstrate effective use of Dreamweaver to build and publish professional websites that employ best practices, adhere to current web standards, and pass Validation.

## **SECTION-A**

**Introduction to HTML** : Information Files Creation; Web Server; Web Client/Browser (Understanding how a Browser communicates with a Web Server); Hyper Text Markup Language (HTML) (HTML Tags, Paired Tags); Commonly used HTML Commands (The structure of an HTML program, Document Head, Document Body); Titles and Footers; Text Formatting (Paragraph

  
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Breaks, Line Breaks); Emphasizing Material in a Web Page (Heading Styles, Drawing Lines); Text Styles (Bold, Italics, Underline); Other Text Effects (Centering (Text, Images etc.); Spacing (Indenting Text)).Lists: Types of Lists (Unordered List (Bullets), Ordered Lists (Numbering), Definition. Adding Graphics to HTML Documents: Using the Border attribute; using the Width and Height Attribute; Using the Align Attribute; Using the ALT Attribute. (12)

### **SECTION-B**

Tables : Introduction (Header, Data rows, The Caption Tag); Using the Width and Border Attribute; Using the Cell padding Attribute; Using the Cell spacing Attribute; Using the BGCOLOR Attribute; Using the COLSPAN and ROWSPAN Attributes. Linking Documents: Links (External Document References, Internal Document References); Images as Hyperlinks (Image Maps).Frames: Introduction to Frames (The <FRAMESET> tag, The <FRAME> tag, Targeting Named Frames.DHTML: Cascading style sheets, Style tag (12)

### **SECTION-C**

Introduction to JavaScript : JavaScript in Web Pages (Netscape and JavaScript, Database Connectivity, Client side JavaScript, Capturing User Input); The Advantages of JavaScript (An Interpreted Language, Embedded within HTML, Minimal Syntax - Easy to Learn, Quick Development, Designed for Simple, Small Programs, Performance, Procedural Capabilities, Designed for Programming User Events, Easy Debugging and Testing, Platform Independence/Architecture Neutral); Writing JavaScript into HTML; (12)

### **SECTION-D**

Forms Used by a Web Site: The Form Object; The Form Object's Methods (The Text Element, The Password Element, The Button Element, The Submit (Button) Element, The Reset (Button) Element, The Checkbox Element, The Radio Element, The Text Area Element, The Select and Option Element, The Multi Choice Select Lists Element); Other Built-In Objects in JavaScript (The String Object, The Math Object, The Date Object); User Defined Objects (Creating a User Defined Object, Instances, Objects within Objects). Cookies: What are Cookies; Setting a Cookie. (12)

### **Suggested Readings/ Books:**

1. Internet for EveryOne: Alexis Leon, 1st Edition, Leon Techworld, Publication, 2009.
2. Greenlaw R; Hepp E, "Fundamentals of Internet and WWW" 2<sup>nd</sup> Edition, Tata McGraw-Hill, 2007

  
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3. Raj Kamal, "Internet & Web Technologies" edition Tata McGraw-Hill Education.2009

4 Bayross Ivan "HTML, DHTML, Javascript, PERL, CGI" 3rd Edition, BPB Publication, 2009

5. Chris Payne, "Asp in 21 Days" 2<sup>nd</sup> Edition, Sams Publishing, 2003

### **PDCA-203 Software Engineering**

#### **Objective:**

The objective of the course is to help the students to get conceptual knowledge required for various methods. Model used under software development process as well as new techniques.

#### **Expected Outcome:**

This would help in optimizing the whole software development process. (9)

#### **SECTION-A**

Software: Characteristics, Components, Applications, And Software Process Models: Waterfall, Spiral, Prototyping, Fourth Generation Techniques, Concepts of Project Management, Role of Metrics & Measurements. (9)

#### **SECTION-B**

S/W Project Planning: Objectives, Decomposition techniques: S/W Sizing, Problem-based estimation, Process based estimation, Cost Estimation Models: COCOMO Model, The S/W Equation, System Analysis: Principles of Structured Analysis, Requirement analysis, DFD, Entity Relationship diagram, Data dictionary. (9)

#### **SECTION-C**

S/W Design: Objectives, Principles, Concepts, Design methodologies: Data design, Architectural Design, procedural design, Object -oriented concepts (9)

#### **SECTION-D**

Testing fundamentals: Objectives, principles, testability, Test cases: White box & Black box testing, Testing strategies: verification & validation, unit test, integration testing, validation testing, system testing. (9)

#### **Suggested Readings/ Books:**

1. Roger. S. Pressman, Software Engineering - A Practitioner's Approach, 7th Edition, McGraw Hill, 2010.



2. Rajib Mall, "Fundamental of Software Engineering ", 3<sup>rd</sup> edition, PHI, 2009.

3. Naseeb Singh Gill, "Software Engineering: Software reliability, testing and quality, Khanna Book Publishing, 2011.

### **PDCA-204 Data Communication and Networks**

#### **Objective:**

The objective of the course is to help the students to get conceptual knowledge of all the networking basics along with various techniques used for communication between networks.

#### **Expected Outcome:**

This would help students to develop a secure network with various methods which they have been studying.

#### **SECTION A**

Introduction to data communication, analog Vs Digital Communication, Fourier Analysis, Band Width limitation, data rate of a channel, Error detection and correction; nature of errors, parity check, CRC, hamming code, Modulation; Multiplexing: SDM, FDM, TDM, STDM. (10)

#### **SECTION B**



Introduction to computer networks and application; network hardware, network software, OSI reference model, TCP/IP model, network standardization, physical layer: circuit switching, packet switching, message switching, terminal handling, telephone system, modems, connections, transmission media. (10)

#### **SECTION C**

Data link layer: design issues, elementary data link protocols-sliding window protocol, HDLC/SDLC, ALOHA, CSMA/CD, token passing, IEEE standard 802 for LAN and WAN. Network layer: design issues, Routing algorithms: shortest path routing, flooding, distance vector routing, flow based routing, Congestion control algorithms: leaky bucket, token bucket, Internet working, the network layer in the Internet IP protocol, IP address. (10)

#### **SECTION-D**

Transport layer: design issues, elements of transport protocol, addressing establishing & releasing a connection, flow control & buffering, TCP/IP service model, TCP connection management. (10)

  
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**Suggested Readings/ Books:**

- 1 Andrew S. Tanenbaum, "Computer Networks", 3<sup>rd</sup> Edition, Pearson Prentice Ltd. 2010.
- 2 Behruoz A Forouzan, "Data Communication and Networking" 4<sup>th</sup> Edition, Tata McGraw Hill, 2009.
- 3 Larry L. Peterson, "Computer Networks: A System Approach", 4<sup>th</sup> Edition, Elsevier Publication, 2008.

**(PDCA-205) Java LAB**

**[CONTROL STRUCTURE]**

- 1) Write a Program to check whether a number is even or odd.
- 2) Write a Program to demonstrate scope and lifetime of variables.
- 3) Write a Program to implement the concept of ternary operator.

**[FUNCTIONS]**

- 4) Write a Program to implement the concept of recursive function.
- 5) Write a Program to implement the concept of constructor.
- 6) Write a Program to demonstrate the concept of method overloading.
- 7) Write a Program to demonstrate the concept of method overriding.
- 8) Write a Program to implement nesting of methods.
- 9) Write a Program to implement the concept of destructor

**[STRINGS]**

- 10) Write a Program to implement the concept of abstract class.
- 11) Write a Program to implement the concept of string methods.

**[INHERITANCE]**

- 12) Write a Program to implement the concept of hierarchical inheritance.
- 13) Write a Program to implement the concept of multilevel inheritances.
- 14) Write a Program to define an interface.
- 15) Write a Program to define final class.
- 16) Write a Program to show the usage of import statement and package declaration in java.

**[EXCEPTION HANDLING]**

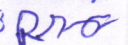
- 17) Write a Program to show the usage of exception handling.
- 18) Write a Program to show the usage of try and catch block.
- 19) Write a Program to demonstrate inner class.

**20) [APPLETS]**

- 21) Write a Program to implement applets.



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**(PDCA-206) Web Technology LAB**

**[HTML]**


1. Write a HTML code that displays various formatting tags.
2. Write a HTML code to create ordered list.
3. Write a HTML code to create unordered list.
4. Write a HTML code to create table having 5 rows and 5 columns.
5. Write a HTML code to create admission form.
6. Write a HTML code to create a frame.
7. Write a HTML code to create image map.
8. Write a HTML code to create hyperlink b/w multiple pages.
9. Write a HTML code to create hyperlink to an image.

**[DHTML]**

10. Write a DHTML code to create cascading style sheet.

**[JAVA SCRIPT]**

11. WRITE A PROGRAM in JavaScript to show a number is big or not.
12. WRITE A PROGRAM in JavaScript to implement for loop.
13. WRITE A PROGRAM in JavaScript to implement while loop.
14. WRITE A PROGRAM in JavaScript to show the usage of if statement.
15. WRITE A PROGRAM in JavaScript to show the usage of if-else statement.
16. WRITE A PROGRAM in JavaScript to show the usage of switch statement.
17. WRITE A PROGRAM in JavaScript to call a function.
18. WRITE A PROGRAM in JavaScript to show function with an arguments.
19. WRITE A PROGRAM in JavaScript to show number is even or odd.
20. WRITE A PROGRAM in JavaScript to show number is prime or not.

  
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**(PDCA-207) Project**

**Project: 200 Marks.**

Joint project will be allowed and joint project report will be also being accepted. Individual project will be recognized and the student should highlight their contribution in a joint project report. Project any of the following Technologies is acceptable.

1. Web Based: HTML/DHTML, Java Script, XML and NETBEANS etc.

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