## POST GRADUATE DIPLOMA IN COMPUTER APPLICATION

**Total Contact Hours = 27          Total Marks = 800          Total Credits = 22**

| SEMESTER 1st | | Contact Hrs.. | | | Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|
| **Subject Code** | **Subject Name** | **L** | **T** | **P** | **Int.** | **Ext.** | **Total** | |
| **PCAP1-101** | Information Technology and Office Automation | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1 -102** | Programming in C | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1 -103** | Computer Organization and Architecture | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1-104** | Software Engineering | 3 | 0 | 0 | 40 | 60 | 100 | 3 |
| **MHUM0-104** | Business Communication - I | 2 | 0 | 0 | 40 | 60 | 100 | 2 |
| **PCAP1-105** | Software Lab-I (Information Technology and Office Automation based on PCAP1-101) | 0 | 0 | 4 | 60 | 40 | 100 | 2 |
| **PCAP1-106** | Software Lab-II (Programming in C based on PCAP1-102) | 0 | 0 | 4 | 60 | 40 | 100 | 2 |
| **MHUM0-102** | Business Communication Lab – I | 0 | 0 | 2 | 60 | 40 | 100 | 1 |
| **Total** | | **14** | **3** | **10** | **380** | **420** | **800** | **22** |

**Total Contact Hours = 30          Total Marks = 700          Total Credits = 23**

| SEMESTER 2nd | | Contact Hrs. | | | Marks | | | Credits |
|---|---|---|---|---|---|---|---|---|
| **Subject Code** | **Subject Name** | **L** | **T** | **P** | **Int.** | **Ext.** | **Total** | |
| **PCAP1-207** | Database Management System | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1-208** | Operating System | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1-209** | Computer Networks | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1-210** | Seminar | 0 | 0 | 6 | 40 | 60 | 100 | 3 |
| **PCAP1-211** | Software Lab-III (Database Management System based on PCAP1-207) | 0 | 0 | 4 | 60 | 40 | 100 | 2 |
| **Departmental Elective - I** | | | | | | | | |
| **PCAP1-256** | Programming in Java | 3 | 1 | 0 | 40 | 60 | 100 | 4 |
| **PCAP1-257** | Programming in PHP | | | | | | | |
| **PCAP1-258** | Programming in ASP.Net | | | | | | | |
| **PCAP1-259** | Software Lab-IV(Programming in Java based on PCAP1-256) | 0 | 0 | 4 | 60 | 40 | 100 | 2 |
| **PCAP1-260** | Software Lab-V(Programming in PHP based on PCAP1-257) | | | | | | | |
| **PCAP1-261** | Software Lab-VI (Programming in ASP.Net based on PCAP1-258) | | | | | | | |
| **Total** | | **12** | **4** | **14** | **320** | **380** | **700** | **23** |

*Note: Students have to select a combination of subjects in Departmental Elective – I as below:*

    i)        PCAP1-256 and PCAP1-259

    ii)      PCAP1-257 and PCAP1-260

    iii)     PCAP1-258 and PCAP1-261

### Overall

| Semester | Marks | Credits |
|---|---|---|
| 1st | 800 | 22 |
| 2nd | 700 | 23 |
| **Total** | **1500** | **45** |

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## INFORMATION TECHNOLOGY & OFFICE AUTOMATION

**Subject Code: PCAP1-101**          **L T P C**                    **Duration: 45 Hrs.**
                                     **3 1 0 4**

### Course Objectives
1. This course will enable the student to gain and understanding of the core concepts and technologies which constitute Information Technology.
2. The intention is for the student to be able to articulate and demonstrate a basic understanding of the fundamental concepts of Information Technology and Office Tools.

### UNIT-I (13 Hrs.)

**Historical Evolution of Computer -** Block Diagram of computer, Characterization of computers, Types of computers, Computer Generations.

**Basic Anatomy of Computers -** Memory unit, Input-output unit, Arithmetic logic unit, Control unit, Central processing unit, RAM, ROM, PROM, EPROM.

**Input-Output Devices -** Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Voice Recognition Devices, Optical Recognition devices, Dot matrix, Character and Line printer, Desk Jet printer, Laser printer and Plotters.

### UNIT-II (9 Hrs.)

**Number System -** Non-positional and Positional number systems, Base conversion, Binary, Decimal, Hexadecimal and Octal systems, Conversion from one system to the other.

**Binary Arithmetic -** Addition, Subtraction and Multiplication

**Computer Codes -** Weighted and Non-weighted code, BCD, EBCDIC, ASCII, Unicode, XS-3, Grey Codes

### UNIT-III (13 Hrs.)

**Computer Software -** Introduction, Types of software.

**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

### UNIT- IV (10 Hrs.)

**Computer Network and Communication -** Network types, Network topologies, Network communication devices.

**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.

### Recommended Books
1. V. Rajaraman, 'Fundamental of Computers', 3rd Edn., PHI.
2. Satish Jain, 'Information Technology Concepts', 4th Edn., BPB Publications.
3. P.K. Sinha, 'Foundations of Computing', 1st Edn., BPB.
4. Turban, Mclean and Wetherbe, 'Information Technology for Management', 2nd Edn., John Wiley & Sons.
5. G. Courter, 'Mastering MS Office 2000 Professional', 2nd Edn., BPB Publication.
6. Steve Sagman, 'MS Office 2000 for Windows', 1st Edn., Addison Wesley.

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## PROGRAMMING IN C

**Subject Code: PCAP1-102**　　　　**L T P C**　　　　　　　**Duration: 45 Hrs.**
　　　　　　　　　　　　　　　　　　**3 1 0 4**

**Course Objectives**
1. 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).
2. Students will learn to write algorithm for solutions to various real life problems and converting the algorithms into computer programs using C language.

### UNIT-I (11 Hrs.)

**Programming Process -** Problem definition, Algorithms, Flow Charts, C Character set, Identifiers and Keywords, Constant and Variables, Data types, Declarations, Statements and Symbolic Constants.

**Operators and Expressions -** Arithmetic, Relational, Logical, Unary operators.

**Bitwise Operators -** AND, OR, Complement precedence and Associating bitwise shift operators

**Input-Output -** Standard, Console and String functions.

**Coding Standards -** Inline documentation, Indentation of Code.

**Naming Conventions -** Variables, Global Variables, Functions, Structures.

**Debugging -** Tracking defects, Debugging by Code Inspection, Debugging by logs, Debugging using step-by-step execution, using break points.

### UNIT-II (13 Hrs.)

**Control Statements -** Branching, Looping using for, While and Do-while Statements, Nested control structures, Switch, Break, Continue statements.

**Arrays -** Definition, Access of Elements, Initialization, Multidimensional arrays, Character arrays.

**Pointers -** Address and Dereferencing operators, Declaration, Assignment, Initialization, Arithmetic, Precedence of Address and Dereferencing Operators, Pointer Comparison, Conversion, Pointer arrays and Pointers to Pointers. Pointers and Strings, Void pointers, Dynamic Memory Management

### UNIT-III (10 Hrs.)

**Functions -** Definition, Call, Prototypes, Formal and Actual parameters, passing arguments to functions, call by value and Call by address, passing array elements as arguments and Passing arrays as arguments, Recursion, Recursion v/s Iteration.

**Program Structure -** Storage classes, Automatic, External and Static variables.

**Pre-processor Directives -** #include, #define, #undef, #if, #ifdef, #ifndef, #else, #elif, #endif, #error, #pragma, Predefine macros.

### UNIT-IV (11 Hrs.)

**Structure -** Variable, Initialization, accessing members, Assignment, Size of structure, Scope of a structure, Nested structures, Pointer to structures, Scope of a structure, Type definition, Structure as function arguments, Arrays of structures, Structures containing arrays, Self-referential structures, Bit fields, Union, Enumerated data type.

**File Processing -** Opening and Closing, Data files, Creation, Processing & Unformatted data files, Random file access, Command line arguments.

**Recommended Books**
1. Shubhnandan Jamwal, 'Programming in C', 3rd Edn., Pearson.
2. E. Balagurusamy, 'Programming in ANSI C', 2nd Edn., Tata McGraw Hill.
3. Brian Kernighan and Dennis Ritchie, 'C Programming Language', 2nd Edn., PHI.
4. Byron Gottfried, 'Programming with C', 2nd Edn., Tata McGraw Hill.

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5. ISRD Group, 'Programming and Problem Solving Using C', 3rd Edn., <u>Tata McGraw Hill.</u>
6. Yashvant P. Kanetkar, 'Let us C', 2nd Edn., <u>BPB Publications, New Delhi</u>.

## COMPUTER ORGANIZATION AND ARCHITECTURE

**Subject Code: PCAP1-103**          **L T P C**                    **Duration: 45 Hrs.**
                                     **3 1 0 4**

### Course Objectives
1. To make students aware about the basic building blocks of computer system and how the different components are interfaced together.
2. Students will come to know about the basic functioning of various parts of computer system from hardware point of view and interfacing of various peripheral devices used with the system.

### UNIT-I (15 Hrs.)
**Boolean Algebra -** Boolean operations, Truth Tables, Boolean Laws, K-maps (2, 3 and 4 variable maps, don't care conditions).
**Basic Gates, Combinational Logic Design -** Half-adder, Full adder, Parallel adder.
**Sequential Circuits -** Concept, Flip-flops (D, RS, JK, T), Counters (Ripple, Asynchronous, Synchronous)

### UNIT-II (9 Hrs.)
**Basic Computer Organization and Design -** Common Bus System, Registers, Instruction codes, Computer Instructions, Timing and Control, Instruction Cycle, Arithmetic, Logic & Shift micro operations instructions, Memory Reference Instructions, Design of Basic Computer and it's working, Addressing modes.

### UNIT-III (9 Hrs.)
**Programming & Controlling Basic Computer -** Machine & Assembly Language, Programming Arithmetic and Logic Operations, Hardwired & Micro programmed control, Address Sequencing, Design of a control unit, Features of RISC and CISC.

### UNIT- IV (12 Hrs.)
**Memory Organization -** Main Memory-Memory Address Map, Memory connection to CPU, Associative Memory-Hardware organization, Cache Memory-Levels of Cache, Associative Mapping, Direct Mapping, Set-Associative Mapping, Virtual Memory.
**I/O organization -** I/O interface, Modes of data transfer: Programmed I/O, Interrupt initiated I/O, DMA. ,    Block diagram depicting architecture of 8085 machine.

### Recommended Books
1. M. Morris Mano, 'Computer System Architecture', 3rd Edn., <u>PHI.</u>
2. William Stallings, 'Computer Organization and Architecture', <u>Pearson.</u>
**3.** P.V.S. Rao, 'Computer System Architecture, 2nd Edn., <u>PHI</u>.
4. J.P. Hayes, 'Computer Architecture & Organization', 3rd Edn., <u>McGraw Hill</u>.
5. Stone, 'Introduction to Computer Architecture', 3rd Edn., <u>Galgotia</u>.
**6.** Tanenbaum, 'Structured Computer Organization', 3rd Edn., <u>PHI.</u>

## SOFTWARE ENGINEERING

**Subject Code: PCAP1-104**          **L T P C**                    **Duration: 45Hrs.**
                                     **3 1 0 4**
### Course Objectives
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.

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## UNIT-I (9 Hrs.)

**Software Engineering -** Evolution of Software Engineering, Goals of software engineering, Software Development vs. Software Engineering.

**Software Process -** Software Process, Waterfall, Spiral, Prototyping, Selection of appropriate process model Fourth Generation Techniques, Role of Metrics &Measurements.

## UNIT-II (11 Hrs.)

**S/W Project Planning -** Objectives of Software Project Planning. Decomposition techniques: S/W Sizing, Problem-based estimation, Process based estimation.

**Cost Estimation Models -** COCOMO Model, the S/W Equation.

**Software Requirements Analysis -** Analysis Principles, SRS, Components of SRS, Requirement Elicitation Techniques- FAST and QFD

## UNIT-III (11 Hrs.)

**Software Design -** Design Objectives, Principles, Design Concepts, Design Process

**Design Methodologies -** Data Design, Architectural Design, and Procedural Design, Object oriented design, User- interface design.

**Principles of structured Analysis and Design Tools -** DFD, DD, Decision Tables and Decision Trees.

## UNIT-IV (14 Hrs.)

**Software Testing -** Testing Fundamentals- Error/Fault/Failure, Testing Principles, Test Cases

**Testing Techniques -** White Box, Black-Box Testing & its Technique: Equivalence Class Partitioning, Boundary Value Analysis, White-Box Testing & its Techniques: Basis Path Testing, Structural Testing, Logic Based Testing, Fault Based Testing.

**Software Testing Strategies -** Unit Testing, Integration Testing, System Testing, Verification and Validation Testing, Acceptance Testing, Alpha and Beta Testing, Regression Testing.

**Recommended Books**

1. R.S. Pressman, 'Software Engineering: A Practitioner's Approach', 3rd Edn., McGraw Hill.
2. Rajib Mall, 'Fundamentals of Software Engineering', 2nd Edn., PHI.
3. Deutsch, Willis, 'Software Quality Engineering: A Total Technical and Management Approach', 2nd Edn., Prentice Hall.
4. T.G. Lewis, 'Software Engineering', 2nd Edn., McGraw Hill.
5. Shere, Kenneth, 'Software Engineering & Management', 2nd Edn., Prentice Hall.

## BUSINESS COMMUNICATION

**Subject Code: MHUM0-104**          **L T P C**                    **Duration: 28 Hrs.**
                                      **2 0 2 3**

**Course Objectives:** This course is designed to give students a comprehensive view of communication, its scope and importance in business, the role of communication in establishing a favorable image of the organization. The aim is to develop students' ability to communicate correctly and effectively on matters having relevance to day-to-day business operations. This course will make student conversant with fundamentals of communication, help them honing oral, written and non-verbal communication skills and to transform their communication abilities.

## UNIT- I (7 Hrs.)

**Introduction to Communication:** Meaning, Process, Importance of Communication in Business, Types of Information, Formal and Informal Communication, Internal and External

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Communication. Approaches to Effective Communication, Essentials of Effective Business Communication (7Cs model)

**Written Communication:** Advantages and Disadvantages, Covering letter, Need, Functions and Kinds, Layout of Letter Writing, Types of Letter Writing: Persuasive Letters, Request Letters, Sales Letters, Complaints and Adjustments

### UNIT –II (7 Hrs.)

**Developing Reading Skills:** Identify the Purpose of Reading, Factors Effecting Reading, Course How to Think and Read, Developing Effective Reading Habits, Reading Tactics and Strategies: Training Eye and Training Mind (SQ3R)

**Developing Listening Skills**: Importance, Purpose of Listening, Art of Listening, Factors Affecting Listening, Components of Effective Listening, Process of Listening, Principles and Barriers to Listening, Activities to Improve Listening

### UNIT- III (7 Hrs.)

**Oral Communication:** Advantages and Disadvantages, Conversation as Communication, Art of Public Speaking, Group Communication Through Committees, Preparing and Holding Meetings, Overcoming Stage Fright, Ambiguity Avoidance.

**Departmental Communication**: Meaning, Need and Types: Interview Letters, Promotion Letters, Resignation Letters, Newsletters, Circulars, Agenda, Notice, Office Memorandums, Office Orders, Press Release

**Report Writing**: Structure, Types, Formats, Drafting of Various Types of Report. Nonverbal – Features, Understanding of Body Language, Posture, Gestures. Influences on Communication: Social Influences, Culture and Communication, Few Guidelines for Better Multicultural Communication, Business Etiquettes and Communication.

### UNIT- IV (7 Hrs.)

**Group Discussion**: Nature, Uses and Importance, Guidelines for GD Presentations: How to Make Effective Presentations, Four P" S of Presentation, Structuring, Rehearsing and Delivery Methods.

**Resume Writing:** Planning, Organizing Contents, Layout, Guidelines for Good Resume. Interviews: Preparation Techniques, Frequently Asked Questions about How to Face an Interview Board, Proper Body Posture, projecting a Positive Image, Steps to Succeed In Interviews, Practice Mock Interview in Classrooms.

**The Case Method of Course:** Dimensions of a Case, Case Discussion, Usefulness of The Case Method, Training of Managers, Use The Case Method. Report Writing: Structure, Types, Formats, Preparations and Presentation.

**Recommended Books**
1. Lesikar, Petit & Flately, 'Lesikar's Basic Business Communication', Tata McGraw Hill.
2. Raman Meenakshi, 'Prakash Singh, Business Communication', Oxford University Press.
3. Rizvi Ashraf, 'Effective Technical Communication', Tata McGraw Hill.
4. Krizan, Buddy, 'Merrier, Effective Business Communication', Cengage Course.
5. Diwan & Aggarwal, 'Business Communication', Excel.
6. Baugh, Frayer & Thomas, 'How to Write First Class Business Correspondence', Viva Book.
7. Taylor, 'English Conversion Practice', Tata McGraw Hill.
8. Devaraj, 'Executive Communication', Tata McGraw Hill.
9. Ober, 'Effective Bossiness Communication', Cengage Course.

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## SOFTWARE LAB. – I
## (INFORMATION TECHNOLOGY & OFFICE AUTOMATION)

**Subject Code: PCAP1-105**          **L T P C**
                                     **0 0 4 2**

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-101.

## SOFTWARE LAB – II (PROGRAMMING IN C)

**Subject Code: PCAP1-106**          **L T P C**
                                     **0 0 4 2**

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-102.

## BUSINESS COMMUNICATION LAB. - I

**Subject Code – MHUM0-102**          **LT P C**
                                      **0 0 2 1**

The students will have to perform the practical in lab related to the syllabus of the subject 'Business Communication – I' (MHUM0-104).

## DATABASE MANAGEMENT SYSTEM

**Subject Code: PCAP1-207**          **L T P C**          **Duration: 45 Hrs.**
                                     **3 1 0 4**

**Course Objectives**

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

### UNIT-I (11 Hrs.)

**Traditional File Processing System -** Characteristics, Limitations, Database: Definition, Composition.

**Database Management System -** Definition, Characteristics, Advantages over Traditional File Processing System, User of Database, DBA and its responsibilities, Database schema, Instance. DBMS architecture, Data independence, Three level Architecture of Database System: External Level, Conceptual Level and the internal level.

**Database Languages -** DDL, DML, DCL. Database utilities, Data Models, Keys: Super, Candidate, Primary, Unique and Foreign.

### UNIT- II (11 Hrs.)

**Introduction to Data Models -** Entity Relationship Model, Hierarchical, Network and Relational Model, Comparison of Network, Hierarchical and Relational Model

**Entity Relationship Model -** Concepts, Mapping cardinalities, Entity Relationship Diagram, Weak Entity Sets, Strong Entity Set, Aggregation, Generalization, Converting ER Diagrams to Table

**Relational Data Model -** Concepts, Constraints, Relational Algebra: Basic Operations, Additional Operations.

### UNIT-III (14 Hrs.)

**Database Design -** Functional Dependency, Decomposition, Problems Arising Out of Bad Database Design, Normalization, Multi-Valued Dependency, Database Design Process, Data Base Protection, Database Integrity.

**Database Concurrency -** Definition and Problems Arising Out of Concurrency

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**Database Security - Authentication**, Authorization, Methods of Implementing Security.
## UNIT- IV (9 Hrs.)
**MS-ACCESS -** Introduction to MS-ACCESS, working with database and tables, queries in Access, Appling integrity constraints, Introduction to forms, sorting and filtering, Controls, Reports and Macro: creating reports, using Macros.

**Recommended Books**
1. C.J. Date, 'An Introduction to Data Base Systems', 3rd Edn., Narosa Publishers.
2. B.P. Desai, 'Database Management System', 3rd Edn., BPB Publications, New Delhi.
3. Henry F. Korth, S. Sudarshan, 'Database System Concepts', 3rd Edn., McGraw Hill.
4. Ramez Elmasri, Shamkant Navathe, 'Fundamentals of Database Systems', 5th Edn., Pearson.
5. Jeffrey D. Ullman, 'Principles of Database Systems', 2nd Edn., Galgotia Pub.
6. D. Kroenke., 'Database Processing', 2nd Edn., Galgotia Publications.
7. Naveen Prakash, 'Introduction to Database Management', 3rd Edn., TMH.
8. Joan Lambert, Joyce Cox, 'Microsoft Access 2013 Step by Step', 1st Edn., Kindle Publications.

| OPERATING SYSTEM |
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| Subject Code: PCAP1-208 | L T P C | Duration: 45 Hrs. |
|---|---|---|
| | 3 1 0 4 | |

**Course Objectives**
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.
## UNIT-I (13 Hrs.)
**Introduction to operating System -** Operating system services, Introduction to various types of operating systems: Batch processing operating system, Multiprogramming operating system, Time Sharing operating system, Multi-tasking operating system, distributed operating system, Network operating system, Real time operating system, Multi-processor system.
**Process Management -** Process concept, types of Process scheduling, Basic concept of CPU Scheduling, Scheduling criteria, and Scheduling algorithms: FCFS, SJF, Round Robin & Queue Algorithms, Deadlock definition and its characterization.
## UNIT-II (11 Hrs.)
**Memory Management -** Single Absolute Partition, Single reloadable partition, Multiprogramming and Multiple Partitions (Multiple Fixed Partitions, Multiple Variable Partitions (Partition Selection Algorithms), Paging, Segmentation
**Virtual Memory -** Demand Paging (Locality of Reference, Page Locking, Page Size, Page Replacement Algorithms, Algorithm Performance, Allocation Policies, Working Set).
## UNIT- III (11 Hrs.)
**File System Management -** Directories and Names (Partitions, Per-Process Root Directory, Directory Structure, and 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).
## UNIT- IV (10 Hrs.)
**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).

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**Recommended Books**
1. Peter bears Galvin, 'Operating System Principle', 7th Edn., <u>Wiley</u>.
2. Madnick and Donovan, 'Operating System', 4th Edn., <u>McGraw Hill.</u>
3. J.L. Peterson, A. Silberchatz, 'Operating System Concepts', 3rd Edn., <u>Addison Wesley</u>.
4. A.S. Tenenbaum, 'Operating System: Design and Implementation', 5th Edn., <u>PHI.</u>

| COMPUTER NETWORKS |
|---|

| Subject Code: PCAP1-209 | L T P C | Duration: 45 Hrs. |
|---|---|---|
| | 3 1 0 4 | |

**Course Objectives**
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.

**UNIT-I (11 Hrs.)**

**Computer Networks -** Introduction, Applications, Network hardware and Software (protocol hierarchies, Design Issues for Layers, Interfaces and Services: Connection Oriented and connection less), Network Structure and Architecture - Point to Point, Multicast, Broadcast, Classification of Networks-LAN, MAN and WAN. Reference Models - the OSI Reference Model.

**Physical Layers -** Circuit Switching, Packet Switching, Message Switching, Terminal Handling, Telephone System, Modems, Connections, Transmission Media.

**UNIT-II (12 Hrs.)**

**Internet -** Introduction, Relays, Repeaters, Bridges, Routers, Gateways

**Internetworking -** How Networks Differ, Concatenated Virtual Circuits, Connectionless Internetworking, Tunnelling, Internetwork Routing, fragmentation, Firewalls, Internet Architecture.

**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.

**UNIT-III (12 Hrs.)**

**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.

**Transport layer -** Design Issues, Elements of Transport Protocol, Addressing Establishing & Releasing a Connection, Flow Control & Buffering, TCP/IP Service Model, TCP Connection Management

**UNIT- IV (10 Hrs.)**

**Application Layer -** The DNS Name Space, Electronic Mail, The World Wide Web, FTP: introduction, data transfer and distributed computation, Generalized File Transfer, The File Transfer Protocol.

**Network Security -** Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, One-Time Pads, Two Fundamental Cryptographic Principles

**Recommended Books**
1. Andrew S. Tanenbaum, 'Computer Networks' 4th Edn., <u>PHI</u>.
2. Behruoz A. Forouzan, 'Data Communications and Networking' 4th Edn., <u>Tata McGraw Hill.</u>
3. Douglas E. Comer, 'Internet Working with TCP/IP', Vol.1, 4th Edn., <u>CPE</u>.
4. Stallings, William, 'Data and Computer Communications', 8th Edn., <u>PHI.</u>
5. Nance, Bary, 'Introduction to Networking', 4th Edn., <u>PHI.</u>

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6. Larry L. Peterson, 'Computer Networks: A System Approach' 4<sup>th</sup> Edn., <u>Elsevier Publication</u>.

| SEMINAR |
|---|
| **Subject Code: PCAP1-210**   **L T P C** |
|                             **0 0 4 2** |

Seminar based on latest trends in IT.

| SOFTWARE LAB-III (DATABASE MANAGEMENT SYSTEM) |
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| **Subject Code: PCAP1-211**   **L T P C** |
|                             **0 0 4 2** |

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-207.

| PROGRAMMING IN JAVA |
|---|
| **Subject Code: PCAP1-256**   **L T P C**            **Duration: 45 Hrs.** |
|                             **3 1 0 4** |

**Course Objectives**
1. Understand the concept of OOPs as well as the purpose and usage principles of Inheritance, polymorphism, encapsulation etc.
2. Understand JVM Concept, Data types and Operators, Strings
3. Understand the basic concepts of classes and objects.
4. Make use of array, constructors, Inheritance, Packages and Interfaces.
5. Understand the concept of Exceptional Handling/Event Handling

### UNIT-I (11 Hrs.)
**Basics of JAVA -** History of Java, Why Java is important to the Internet, Security and portability, Byte Code, Java Virtual Machine, Object Oriented Concepts: Object, Object oriented programming, Abstraction, Encapsulation, Inheritance, Polymorphism. Basic Constructs: Data types, Variables, Array, Operators, Control Statements, Looping Statements.

### UNIT-II (12 Hrs.)
**Introduction to Classes -** Class, declaring object, introducing methods in a class, Constructors, Inner and outer class, Exploring the String class. Access control: Public access control, Private access control, Protected access control, static, this, super, final keywords.

### UNIT-III (12 Hrs.)
**Inheritance -** Types of inheritance, Using super, Method Overloading, Overriding

### UNIT- IV (10 Hrs.)
**Advanced Concepts -** Introduction to Interface, Packages, Exception handling, Multithreaded Programming, Applets, Event Handling.

**Recommended Books**
1. Y. Daniel Liang, 'Introduction to Java Programming', 9<sup>th</sup> Edn., <u>Pearson</u>, **2011.**
2. Herbet Schildt, 'Java 2: The Complete Reference', 5<sup>th</sup> Edn., <u>McGraw Hill</u>, **2002.**
3. Gary Cornell and Cay S. Horstmann, 'Core Java, Volume 2- Advanced Features', 8<sup>th</sup> Edn., <u>Pearson</u>, **2008.**
4. Ed Roman , Rima Patel and Gerald Brose, 'Mastering Enterprise Java Beans', 3<sup>rd</sup> Edn., <u>John Wiley & Sons Inc.</u>, **2004.**

## PROGRAMMING IN PHP

**Subject Code: PCAP1-257**          **L T P C**                    **Duration: 45 Hrs.**
                                     **3 1 0 4**

**Course Objectives**

The objective of the course is to help the students to get conceptual knowledge of client side and server side scripting. Working knowledge of PHP Programming, developing dynamic websites and interaction with databases.

### UNIT-I (10 Hrs.)

**HTML -** Introduction to HTML, Basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external, mail and image links. Lists: ordered, unordered and definition, Table tag, HTML Form controls: form, text, password, text area, button, checkbox, radio button, select box, hidden controls, Frameset and frames CSS: Introduction to Cascading Style Sheet (CSS).

### UNIT-II (11 Hrs.)

**PHP -** Introduction to PHP, Server side scripting, Role of Web Server software, including les, comments, variables and scope, echo and print, Operators: Logical, Comparison and Conditional operators, branching statements, Loops, break and continue, PHP functions.

### UNIT-III (12 Hrs.)

**Working with PHP -** Passing information between pages, HTTP GET and POST method, String functions: strlen, strops, strstr, strcmp, substr, str replace, string case, Array constructs: array (), list () and foreach (),
PHP advanced functions: Header, Session, Cookie, Object-Oriented, Programming using PHP: class, object, constructor, destructor and inheritance

### UNIT- IV (12 Hrs.)

**PHP & MySQL -** Features of MySQL, data types, Introduction to SQL commands - SELECT, DELETE, UPDATE, INSERT, PHP functions for MySQL operations: mysql connect, mysql select db, mysql query, mysql fetch row, mysql fetch array, mysql fetch object, mysql result, Displaying data from MYSQL in webpage.

**Recommended Books**

1. Jon Duckett, 'Beginning HTML, XHTML, CSS, and JavaScript (Wrox Programmer to Programmer)', <u>Wrox</u>, Indian Edition, **2009**.
2. Tim Converse, Joyce Park, Clark Morgan, 'PHP5 and MySQL Bible', 1<sup>st</sup> Edn., <u>Wiley</u>, **2010.**
3. Janet Valade, 'PHP and MySQL For Dummies', 4<sup>th</sup> Edn., <u>Wiley</u>, **2009**.

## PROGRAMMING IN ASP.NET

**Subject Code: PCAP1-258**          **L T P C**                    **Duration: 45 Hrs.**
                                     **3 1 0 4**

**Course Objectives**

1. Set up a programming environment for ASP.net programs.
2. Configure an asp.net application.
3. Creating ASP.Net applications using standard .net control
4. Develop a data driven web application.

### UNIT-I (10 Hrs.)

**Introduction -** ASP.Net Introduction-The .Net framework, The .Net Languages, CLR, Types, Objects and Namespaces, Settings for ASP.Net and IIS.

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## UNIT-II (11 Hrs.)

**Developing ASP.Net Application -** Developing ASP.Net Application - Asp.Net Application, Differences between Web based and Windows based application, Web from fundamentals, Web Controls, working with events – Rich web controls – Custom web controls.

## UNIT-III (12 Hrs.)

**Form Validation -** Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range, Calendar control, Ad rotator Control, Internet Explorer Control, State management- View state, Session state, Application state.

## UNIT- IV (12 Hrs.)

**Architecture of ADO.NET -** Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class, DataAdapter Class, Dataset Class. Display data on data bound Controls and Data Grid. Database Accessing on web applications: Data Binding concept with web, creating data grid, Binding standard web server controls. Display data on web form using Data bound controls.

**Recommended Books**

1. David S. Platt, 'Introducing .Net', 3rd Edn., Microsoft Press, **2003**.
2. Alex Homer et. al. – 'Professional ASP .NET 1.1', 2nd Edn., Wiley Dreamtech India Pvt. Ltd., **2005.**
3. Mridula Parihar, Essam Ahmed, Jim Chandler, Bill Hatfield, Rick Lassan, Peter MacIntyre, Dave Wanta 'ASP .NET Bible', 2nd Edn., Wiley Dreamtech India Pvt. Ltd., **2002.**

| SOFTWARE LAB.-IV (PROGRAMMING IN JAVA) |
|---|

**Subject Code: PCAP1-259**          **L T P C**
                                      **0 0 4 2**

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-256.

| SOFTWARE LAB.-V (PROGRAMMING IN PHP) |
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**Subject Code: PCAP1-260**          **L T P C**
                                      **0 0 4 2**

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-257.

| SOFTWARE LAB.-VI (PROGRAMMING IN ASP.Net) |
|---|

**Subject Code: PCAP1-261**          **L T P C**
                                      **0 0 4 2**

This laboratory course will comprise as exercises to supplement what is learnt under paper PCAP1-258.