PERIYAR   UNIVERSITY
SALEM   638 011

MASTER OF COMPUTER APPLICATIONS
(M.C.A)

REGULATIONS AND SYLLABUS
(Under CBCS)
(Effective from the Academic year 2008-2009 and thereafter)

Regulations

Effect from the academic year 2008 - 2009

1. OBJECTIVE OF THE PROGRAMME

To transform graduates with potential in computational into experts in information technology that the industry requires from time to time. The course is designed to impact professional knowledge and practical skills to the students.

2. CONDITION FOR ADMISSION

Candidates who have secured 55% of marks or above in any one of the following or equivalent, are eligible to apply:

(i)   Bachelor's Degree in any subject with Mathematics at +2 level

OR

(ii)   Bachelor's Degree in any subject with Mathematics/Statistics as one of the subjects.

3. DURATION OF THE PROGRAMME

The duration of the degree of Master of Computer Applications shall consist of three Academic years divided into six semesters. Each semester consist of 90 working days.

4. EXAMINATIONS :

The examination shall be three hours duration to each paper at the end of the each semester. The candidate failing in any subject(s) will be permitted to appear for each failed subject(s) in the subsequent examination.

One internal and one external examiner should conduct practical Examinations at the end of each semester. At the end of sixth semester viva-voce will be conducted on the basis of the Dissertation /Project Report submitted by the student. The project should be individual work. One internal and one external examiner will conduct the viva-voce jointly.

5. STRUCTURE OF M.C.A PROGRAMME UNDER CBCS PATTERN FOR AFFILIATED COLLEGES
(FROM 2008 AND THEREAFTER)

Curriculum and Scheme of Examinations

Courses	Number of Credits	Hours Per Week	Exam Duration (hrs)	Marks		
				I. A	E.E	Total
Semester-I						
Core Course-I-08PCA01-Computer Organization and Architecture	4	4	3	25	75	100
Core Course-II-08PCA02-Data Structures	4	4	3	25	75	100
Core Course-III-08PCA03-Theory of Programming Languages and C	4	4	3	25	75	100
Core Course-IV-08PCA04-Discrete Structures and Automata Theory	4	4	3	25	75	100
Core Course-V-08PCA05-Managerial Accounting	4	4	3	25	75	100
Core Course-VI - 08PCAP01-Lab – I C Programming Lab	2	5	3	40	60	100
Core Course-VII- 08PCAP02-Lab - II Data Structures Lab	2	5	3	40	60	100
Semester-II						
Core Course-VIII-08PCA06-Object Oriented Programming	4	4	3	25	75	100
Core Course-IX - 08PCA07-Microprocessor and Applications	4	4	3	25	75	100
Core Course-X-08PCA08-Database Management Systems	4	4	3	25	75	100
Core Course-XI-08PCA09-Design and Analysis of Algorithms	4	4	3	25	75	100

EDC –I	4	4	3	25	75	100
Core Course-XII-08PCAP03-Object oriented Programming Lab-III	2	5	3	40	60	100
Core Course-XIII-08PCAP04-Lab – IV Relational Database Management System Lab	2	5	3	40	60	100
Semester-III						
Core Course-XIV-08PCA10 Visual Programming	4	4	3	25	75	100
Core Course-XV-08PCA11 Operating Systems	4	4	3	25	75	100
Core Course-XVI-08PCA12 Software Engineering	4	4	3	25	75	100
Core Course-XVI-08PCA13 Optimization Techniques	4	4	3	25	75	100
Elective Course-I-08PCAZ_	4	4	3	25	75	100
Core Course-XVII-08PCAP05 Lab- V Visual Programming Lab	2	5	3	40	60	100
Core Course-XVIII–08PCAP06 - Lab-VI Operating Systems Lab	2	5	3	40	60	100
Semester-IV						
Core Course-XIX-08PCA14 Computer Graphics	4	4	3	25	75	100
Core Course-XX-08PCA15 Computer Networks	4	4	3	25	75	100
Core Course-XXI-08PCA16 Advanced Java Programming	4	4	3	25	75	100
Core Course-XXII-08PCA17 Multimedia and Virtual Reality	4	4	3	25	75	100
Elective Course-II- 08PCAZ_	4	4	3	25	75	100
Core Course-XXIII-08PCAP07 Lab-VII – Advanced Java Programming Lab	3	5	3	40	60	100

Core Course-XXIV – 08 PCAP08 Mini Project	3	3	3	40	60	100
Human Rights	-	2	3	-	-	100
Semester-V						
Core Course-XXV-08PCA18 E-Technologies	4	4	3	25	75	100
Core Course-XXVI-08PCA19 .Net Programming	4	4	3	25	75	100
Core Course-XXVII-08PCA20 Web Technologies	4	4	3	25	75	100
Elective Course-III- 08PCAZ_	4	4	3	25	75	100
Elective Course-IV- 08PCAZ_	4	4	3	25	75	100
Core Course-XXVIII- 08PCAP09-LAB-VIII .Net Programming Lab	3	5	3	40	60	100
Core Course-XXIX- 08PCAP10-LAB-IX Web Programming Lab	3	5	3	40	60	100
Semester-VI						
Core Course-XXX-08PCAP11 Dissertation and Viva-Voce	16	-	-	50	150	200
Total no. of Credits {Core EDC Elective	120 04 16					
Grand Total	140					
Total Marks						3800

Electives

Elective Course -I
Course 08 PCAZ01   **Compiler Design**
Course 08 PCAZ02   **Object Oriented Analysis and Design**
Course 08 PCAZ03   **Parallel Processing**
Course 08 PCAZ04   **Principles of Programming Languages**

Elective Course -II
Course 08 PCAZ05   **Artificial Intelligence**
Course 08 PCAZ06   **Mobile Computing**
Course 08 PCAZ07   **Soft Computing**
Course 08 PCAZ08   **Organizational Behaviour**

Elective Course -III
Course 08 PCAZ09   **Data Mining and Warehousing**
Course 08 PCAZ10   **Enterprise Resource Planning**
Course 08 PCAZ11   **Software Project Management**
Course 08 PCAZ12   **Software Testing Techniques**

Elective Course -IV
Course 08 PCAZ13   **Network Security and Cryptography**
Course 08PCAZ14   **Distributed Databases**
Course 08 PCAZ15   **Digital Image Processing**
Course 08PCAZ16   **Wireless Application Protocol**

EDC-EXTRA DISCIPLINARY COURSE
Students are expected to opt EDC (Non major elective) offered by other departments.

I.A – INTERNAL ASSESSMENT

E.E – EXTERNAL EXAMINATIONS

       The content of the syllabus and regulations may be followed for first and second semesters as per the regulations and syllabus passed in the academic year 2006-2007 except for the courses 08PCAP01 and 08PCAP02. The detailed syllabi for courses 08PCAP01 and 08PCAP02 are enclosed.

EXAMINATIONS
THEORY
EVALUATION OF **INTERNAL ASSESSMENT**

Test	:	10 Marks
Seminar	:	05 Marks
Assignment	:	05 Marks
Attendance	:	05 Marks

Total	:	25 Marks

The Passing minimum shall be 50% out of 25 marks (13 marks)
EVALUATION OF **EXTERNAL EXAMINATIONS**
QUESTION PAPER PATTERN
Time duration: 3 Hours   Max. Marks : 75

PART- A: 5x5 = 25
Answer all the questions
Either or type for each unit
PART- B: 5x10 = 50
Answer all the questions
Either or type for each unit

The Passing minimum shall be 50% out of 75 marks (38 marks)
PRACTICAL \ MINIPROJECT
EVALUATION OF **INTERNAL ASSESSMENT**

Test 1	:	15 Marks
Test 2	:	15 Marks
Record	:	10 Marks

Total	:	40 Marks

The Passing minimum shall be 50% out of 40 marks (20 Marks)
EVALUATION OF **EXTERNAL EXAMINATIONS**
Time duration: 3 Hours   Max. Marks : 60
QUESTION PAPER PATTERN
1. One compulsory question from the given list of objectives   : 30 Marks
2. One Either/OR type question from the given list of objectives : 30 Marks
Distribution of Marks

Problem Understanding	: 05 Marks
Program writing	: 10 Marks
Debugging	: 10 Marks
For Correct Results	: 05 Marks

Mini-Project Viva-voce (joint)   : 60 Marks

DISSERTATION

Evaluation (External)	**: 50 Marks**
Viva-voce (joint)	**: 100 Marks**

6. **REGULATIONS OF PROJECT WORK**

   a. Students should do their five months [Dec To Apr] Project work in Company / Institutions.

   b. The Candidate should submit the filled in format as given in Annexure-I to the department for approval during the Ist Week of January in their Project semester.

   c. Each internal guide shall have maximum of eight Students.

   d. Periodically the project should be reviewed minimum three times by the advisory committee.

   e. The Students should prepare three copies of the dissertation and submit the same to the college on **30th April** for the evaluation by examiners. After evaluation one copy is to be retained in the college library and one copy is to be submitted to the University (Registrar) and the student can hold one copy.

   f. A Sample format of the dissertation is enclosed in Annexure-II.

   g. Format of the Title page and certificate are enclosed in Annexure III.

   h. The Students should use OHP / Power Point Presentation during their Project Viva voce Examinations.

7. **PASSING MINIMUM**

   Sessional marks will be awarded to the candidates for both theory and practical. It will be based on two class tests and assignments/lab reports for theory/practical. During the sixth semester the students are asked to present the progress atleast thrice to the department committee, based on which sessional mark is awarded.

   The candidate shall be declared to have passed the examinations in a subject , if the candidate secures not less than 50% of the total prescribed marks for the subject in Sessional and University Examinations put together, subject to the candidate getting a minimum of 50% of the marks in the University examination .

08. **CLASSIFICATION OF SUCCESSFUL CANDIDATES**

Candidates who secure not less than 60% of the aggregate marks in the whole examination shall be declared to have passed the examination in **First Class**. All other successful candidates shall be declared to have passed in **Second Class**. Candidates who obtain 75% of the marks in the aggregate shall be deemed to have passed the examination in **First Class with Distinction** provided they pass all the examinations prescribed for the course at the first appearance.

Candidates who pass all the examinations prescribed for the course in first instance and within a period of three academic years from the year of admission to the course only are eligible for **University Ranking.**

09. MAXIMUM DURATION FOR THE COMPLETION OF THE PG PROGRAMME

The maximum duration for completion of the PG Programme shall not exceed ten semesters.

10   COMMENCEMENT OF THIS REGULATION:

These regulations shall take effect form the academic year 2008-09, i.e.,for students who are admitted to the first year of the course during the academic year 2008-09 and thereafter.

11.   TRANSITORY PROVISION:

Candidates who were admitted to the PG course of study before 2008-2009 shall be permitted to appear for the examinations under those regulations for a period of three years i.e., up to and inclusive of the examination of April/May 2009. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

ANNEXURE - I

PERIYAR UNIVERSITY

College Name   :

Course   :

Student Name   :

Register Number   :

Title of the Project   :

Address of Organization / Institution :

Name of the External Guide   :

Designation   :

Place :

Date :   Signature of External Guide

                                                                                        (with seal)

Name of the Internal Guide   :

Qualification   :

Teaching Experience   :

Place :

Date :   Signature of Internal Guide

                                        Principal

                        [Approved or not Approved]

                        [University Use]

ANNEXURE II

COLLEGE BONAFIDE CERTIFICATE

COMPANY ATTENDANCE CERTIFICATE

ACKNOWLDGEMENT

CONTENTS

SYNOPSIS   Page No.

1. INTRODUCTION

ORGANIZATION PROFILE

SYSTEM CONFIGURATION

HARDWARE CONFIGURATION

SOFTWARE CONFIGURATION

2. SYSTEM STUDY

EXISTING SYSTEM

DRAWBACKS

PROPOSED SYSTEM

SYSTEM STUDY

FEATURES

3. SYSTEM DESIGN AND DEVELOPMENT

FILE DESIGN

INPUT DESIGN

OUTPUT DESIGN

CODE DESIGN

DATABASE DESIGN

SYSTEM DEVELOPMENT

4. TESTING AND IMPLEMENTATION

CONCLUSION

BIBLIOGRAPHY

APPENDICES

A. DATA FLOW DIAGRAM

B. TABLE STRUCTURE

C. SAMPLE INPUT

D. SAMPLE OUTPUT / REPORT

ANNEXURE III

A. Format of the title page

TITLE OF THE DISSERTATION

A Dissertation submitted in partial fulfillment of

the requirements for the degree of

Master of Computer Applications

to the

Periyar University, Salem - 11

By

STUDENT NAME

REG. NO.
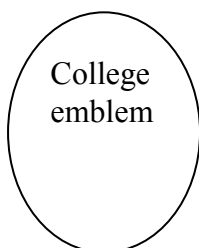
College
emblem

COLLEGE NAME
(AFFLIATED TO PERIYAR UNIVERSITY)
PLACE with Pin Code

MONTH – YEAR

B. Format of the Certificate

COLLEGE NAME
(AFFLLIATED TO PERIYAR UNIVERSITY)
PLACE with PIN CODE

College
emblem
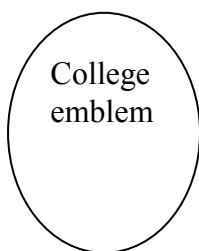
MONTH – YEAR

PROJECT WORK

TITLE OF THE DISSERTATION

Bonafide Work Done by

STUDENT NAME

REG. NO.

A Dissertation submitted in partial

fulfillment of the requirements for the award of

Master of Computer Applications

of the **Periyar University, Salem.**

INTERNAL GUIDE   HEAD OF THE DEPARTMENT

Submitted for the Viva-Voce Examination held on _____

Internal Examiner   External Examiner

SEMESTER I

08PCA01 COMPUTER ORGANIZATION AND ARCHITECTURE

4 Credits

UNIT – I

Number system Binary, Decimal, Octal, and Hexadecimal – Conversion from one to another – Complements – Binary Codes. Basic logic Gates – Basic Theorems and Properties of Boolean Algebra – NAND, NOR implementation – Sum of Product – Product of Sums – Karnaugh Map – Tabulation – Don't Care Conditions.

UNIT - II

Combinational Logic Circuit Design: Multiplexers – Demultiplexers – Decoders – Encoders - Half Adder – Full Adder - Subtractor – Parallel Adder. Flip-flops: RS, D, JK Flip-flop – Registers – Shift Registers – Ripple Counters Synchronous Counters.

UNIT - III

Register Transfer and Micro Operation Arithmetic Register Transfer Language – Register Transfer, Logic Bus and Memory Transfers. Shift micro operations – Arithmetic Logic Shift unit – CPU: Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation, Program Control.

UNIT - IV

Micro programmed Control: Control Memory – Address Sequencing Conditional Branching - Mapping of Instructions – Microprogram Example: Computer Configuration – Micro instructions format – Symbolic Micro Instructions – Fetch Routine – Symbolic Micro Programme – Binary Microprogram – Computer Arithmetic: Additional and Subtraction, Multiplication Algorithm – Division Algorithm – Floating Point Arithmetic Operation.

UNIT - V

 Input – Output Organization: Peripheral Devices – Input - Output Interface – Asynchronous Data Transfer (Strobe & Handshaking Method) – Modes of Transfer – Priority Interrupt – DMA – IOP. Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory.

TEXT BOOKS
  1. Morris Mano, "Digital Logic and Computer Design", PHI/Pearson, 1995.

(Unit I & II)
2. Morris Mano, "Computer System Architecture", Third Edition, PHI/
   Pearson Education 1995. (Unit III, IV & V)

REFERENCE BOOKS
1. Malvino leech, "Digital Principles and Applications", TMH,
   Edn.1991.
2. J. P. Hayes, "Computer Organization and Architecture", TMH,
   Second Edition, 1988.
3. William Stallings, "Computer Organization & Architecture –
   Designing for Performance", Pearson Education, Sixth Edition, 1997.

08PCA02 DATA STRUCTURES

4 Credits

UNIT - I
Introduction: Definitions – Concept of Data Structures – Overview of Data Structures – Implementation. Arrays: Definition – Terminology – One-Dimensional Array – Multi-Dimensional Arrays – Pointer Arrays. Linked Lists: Definition – Single Linked List – Circular Linked List – Double Linked List – Circular Double Linked List – Memory Representation - Buddy System – Compaction.

UNIT - II
Stacks: Introduction – Definition – Representation of Stack – Operations on Stacks – Applications of Stacks – Evaluation of Arithmetic Expression – Implementation of Recursion. Queues: Introduction - Definition – Representation of Queues – Various Queue Structures. Tables: Rectangular Tables – Jagged Tables – Inverted Tables - Hashed Tables – Hashing Techniques.

UNIT - III
Trees: Definition – Binary Trees – Properties – Representation – Operations – Threaded Binary Trees – Trees and Forest. Graphs: Introduction – Terminologies – Representation - Linked Representation – Matrix Representation – Operations on Matrix Representation of Graphs.

UNIT - IV
Sorting: Insertion Sort - Shell Sort – Heap Sort – Merge Sort – Quick Sort
- Sorting Large Structures – Bucket Sort – External Sorting: Needs – Model For External Sorting – The Simple Algorithm – Multiway Merge. Search trees: The Search Tree ADT-Binary Search Trees – AVL Trees – B-Trees.

UNIT – V
Application: Sparse Matrix Manipulation – Polynomial representation – Dynamic Storage Management – Tower of Hanoi Problem – Activation Record Management – Simulation – CPU Scheduling in Multiprogramming Environment – Shortest Path – Warshall's Algorithm.

TEXT BOOKS
1. D.Samanta, "Classic Data Structures", Prentice-Hall India Pvt Ltd, Sixth Printing,
   August 2005.

2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C ", Pearson Education, Second Edition, Reprint 2002.(Unit IV)

REFERENCE BOOKS
1. John Paul Tremlay and Paul G.Sorenson, "An Introduction to Data Structures with Applications",TMH, 1995.
2. Horowitz.E. and Sahani, "Fundamentals of Data Structures", Galgotia Pub-1982.

08PCA03 THEORY OF PROGRAMMING LANGUAGES AND C

4 Credits

UNIT – I

Planning the Computer Program – Flow Chart – Types of Logic used in Flow Chart – Computer Languages – Hierarchy of Programming Languages – Classifications of Programming Languages – Popular Programming Languages – Program Development Process – Characteristics of a Good Program – Error in Programming.

UNIT – II

An Overview of C – Keywords and Identifiers - Constants – Variables -Data Types – Input – Output Operations – Operators and Expressions – Decision Making and Branching – Loop Control Structures.

UNIT – III

Function – Arrays – Strings.

UNIT –IV

Structures - Pointers – Introduction – Pointers and Arrays – Pointers and Strings – Pointers and Structures – Pointers and Functions – Dynamic Memory Allocation.

UNIT – V

File Handling : Introduction – Operations on Files – File I/O functions – Random Access – Error Handling – Command Line Arguments – Preprocessor – Graphics Primitives.

TEXT BOOKS

1. D.P.Nagpal, "Computer Fundamentals – Concepts System & Applications"
2. M.T.Somashekara, "Programming in C",PHI,2005.

REFERENCE BOOKS

1. Ashok N.Kamthane, "Programming with ANSI and Turbo C", Pearson Education Asia, 2003.
2. T.Jeyapoovan, "A First Course in Programming with C", Vikas 2002.
3. Noel Kalicharan, "C By Example" , Cambridge, 1994.
4. Yeswanth Kanetkar , "Let us C", BPB publications, 2001
5. Yeswanth Kanetkar , " Pointers in C", BPB publications

08PCA04 DISCRETE STRUCTURES AND AUTOMATA THEORY
(Proof of theorems is not mandatory)
4 Credits

UNIT - I

Fundamentals and Logic: Set Theory – Set Operations – Computer Representation of Sets – Mathematical Induction – Logic – Normal Forms – Logical Inferences – Predicate Logic - Rules of Inference.

UNIT - II

Relations: Introduction - Properties – Equivalence – Representation and Digraphs – Closures . Functions: Composition – Permutation – Recursion. Algebraic Structures: Algebraic Systems – Isomorphism and Homomorphism – Groups.

UNIT - III

Automata Theory: Introduction –Alphabets – Strings – Languages – Problems. Finite Automata: Introduction – Deterministic Finite Automata – Non-Deterministic Finite Automata - Application: Text Search – Finite Automata with Epsilon-Transitions.

UNIT - IV

Regular Expressions – Finite Automata and Regular Expressions - Algebraic Laws for Regular Expressions – Proving Languages not to be Regular – Decision Properties of Regular Languages – Equivalence and Minimization of Automata – Moore and Mealy Machines**.**

UNIT - V

Context-Free Grammars: Definition – Derivations using a Grammar – Leftmost and Rightmost Derivations – The Language of a Grammar – Sentential Forms. Pushdown Automata: Definition – Deterministic Pushdown Automata. Turing Machine: Introduction – Notation - Description – Transition Diagram – Languages – Turing Machines and Halting.

TEXT BOOKS
1. Rm.Somasundaram, "Discrete Mathematical Structures", Prentice-Hall of India Private Limited 2003. (unit I & II)
2. John E.Hopcroft, Rajeev Motwani, Jeffery D. Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education, 2001.(Unit III, IV & V)

REFERENCE BOOKS:
1. S.P.E.Xavier, "Theory of Automata, Formal Languages and Computations", New Age International,2004.
2. J.P.Tremblay and R.Manohar, "Discrete Mathematical Structures with Applications to Computer Science", McGraw-Hill Book Company, 1987.
3. E.V. Krishnamurthy, "Introductory Theory of Computer Science", East-West Press Pvt. Ltd, 1983.
4. Bernard M.Moret, "The Theory of Computation", Pearson Education, 1998.
5. A.M.Natarajan, A.Tamilarasi, P.Balasubramani, "Theory of Computation", New Age International,2003.

08PCA05 MANAGERIAL ACCOUNTING

4 Credits

UNIT - I

Accounting: Definition – Objectives - Branches of Accounting - Accounting Concepts and Conventions - Groups Interested in Accounting Information - Accounting Rules – Journal - Ledger - Trial Balance – Preparation Final Accounts of Sole Trading Concerns.

UNIT -II

Analysis and Interpretation of Financial Statements: Tools used - Comparative Statement - Common Size Statement and Trend Percentage. Ratio Analysis: Meaning - Advantages and Limitations - Classification of Ratios – Solvency – Profitability - Activity and Capital Structure Ratios**.**

UNIT - III

Fund Flow Analysis: Concept of Funds - Fund Flow Statement - Uses and Limitation - Preparation of Fund Flow Statement. Cash Flow Analysis: Computation of Cash from operation and Preparation of Cash Flow Statement.

UNIT - IV

Rate o Budget and Budgetary Control: Meaning – Advantages and limitations - Classification of Budgets - Preparation of Production - Sales - Cash and Flexible Budgets. Capital Budget: Meaning and Importance - Methods of Ranking Investment Proposals - Pay-Back - Average f Return and Discounted Cash Flow Methods.

UNIT - V

Marginal Costing: Meaning - Advantages and Uses - Cost Volume - Profit Analysis - Break-even Concept - Uses and Assumptions - Decisions Involving Alternative Choices.

TEXT BOOKS
1. Shukla M.C. & Grewal T.S., "Advanced Accounts", 1991,S.Chand, (Unit I)
2. Dr.S.N.Maheswari, "Principles of Management Accounting", Sultan Chand & sons,2005.(Unit II to Unit V)

REFERENCE BOOKS:
1. S.P.Jain & K.L.Narang, "Advanced Accountancy – Part-I", Kalyani, Publishers,1991.
2. Gupta R.L.& Radhasamy M., "Advanced Accounts (Vol.II)", S.Chand, 1991.
3. R.K.Sharma & Shasi K.Gupta, " Management Accounting – Principles And Pratices ", Kalyani publishers, 1992.
4. Man mohan & S.N.Goyal, "Principles Of Management Accounting", Agra, Sahithya Bhawan, 1987.
5. Hingorani N.L. & Ramanathan A.R., " Management Accounting ", S. Chand, Edn.2, 1982.

08PCAP01 C PROGRAMMING LAB

2 Credits

Develop Programs to implement the following:

1. Perform various Operations on Single Dimensional Arrays.

2. Perform various Operations on Matrices

3. Perform String Operations using String Library Functions

4. Functions and recursive functions

5. Structures with array elements

6. Array of structures

7. Union

8. Accessing data using Pointers

9. Arrays of pointers and Pointer to arrays and structures

10. String Handling

11. Macros

12. Creation and Processing of sequential files

13. Create random file and perform various Operations

14. Pass Command line arguments to main function and use them

15. Graphics Primitives

08PCAP02 DATA STRUCTURES LAB

2 Credits

Develop C Programs to implement the following:

1. Sorting a set of numbers using
   i)   Bubble sort
   ii)   Insertion sort
   iii)   Selection sort
   iv)   Merge sort
   v)   Heap sort
   vi)   Quick sort
2. Search and print the position of the number using
   i)   Linear search technique
   ii)   Binary search technique
3. Perform Various operations on one Dimensional arrays
4. Perform Various operations on two Dimensional arrays

5. Perform Various operations on Pointer arrays

6. Perform Various operations on Sparse Matrices

7. Perform Polynomial Addition and Multiplication

8. Perform various operations on Stacks

9. Perform various operations on Queues

10. Perform various operations on Linked Lists

11. Perform various operations on Circular Linked Lists

12. Perform various operations on Doubly Linked Lists

13. Perform various operations on Circular Doubly Linked Lists

14. Perform various operations on Binary Trees

15. Dijkstra's algorithm to find shortest path

SEMESTER II
08PCA06 OBJECT ORIENTED PROGRAMMING

4 Credits

UNIT - I

Basic Concepts of OOP – Structure of C++ - Data types - Variables – Control Structures – Functions – Classes and Objects – Constructors and Destructors.

UNIT - II

Overloading: Function, Operator – Inheritance – Pointers – Virtual Function – Polymorphism.

UNIT - III

Streams in C++ - Stream Classes – Formatted and Unformatted data – Manipulators – User Defined Manipulators – File Streams – Opening and Closing a File – File Pointers Manipulation – Template Classes and Functions – Exception Handling: Try, Catch, Throw.

UNIT - IV

Introduction to Java – Features of Java – Methods and Classes – Array, Strings and Vector – Inheritance – Packages and Interfaces.

UNIT - V
Exception Handling – Multithreading – Applets – Graphics Programming.

REFERENCE BOOKS

1. E.Balagurusamy, "Object Oriented Programming with C++", TMH, Second Edition, 2001.
2. Ravichandran, "Programming with C++", TMH, 1996.
3. Bjarne Stroustrup, "The C++ Programming Language", Addision Wesley, 2004.
4. Patrick Naughton and Hilbert Schildt, "The Complete Reference Java 2", TMH, 2003.
5. E.Balagurusamy, "Programming with Java A Primer", TMH, Second Edition, 1999.
6. R.Krishnamoorthy, S.Prabhu, "Internet and JAVA Programming ", New Age International, 2005.
7. Debasish Jana, "Java and Object Oriented Programming Paradigm", PHI, 2005.

04PCA07   MICROPROCESSOR AND APPLICATIONS
4 Credits

UNIT-I

Evolution of Microprocessor – Typical Micro Computer Architecture – Single Chip Microprocessor – Memory – Input/Output.

UNIT – II

Intel 8085: Introduction – Register Structure- Memory Addressing – 8085 Addressing modes – 8085 Instruction Set – Timing Methods- 8085 CPU pins and Associated Signals – 8085 Instruction Timing and Execution – Programmed I/O – Interrupt System – DMA – SID and SOD Lines – 8085 Based System Design.

UNIT – III

Interfacing Devices: Introduction – Types of Interfacing Devices – Addressing Decoding for I/O – Input/Output Ports – Programmable Interrupt Controller – Programmable DMA Controller: 8257 Programmable DMA Controller, Dynamic RAM Refresh using DMA – Communications Interface – Analog Input Devices – Analog Output Devices.

UNIT – IV

16-bit Microprocessor: Intel 8086:Introduction – Architecture – Addressing Modes – 8086 Input/Output. Motorola MC 68000:Introduction – Registers – Memory Addressing – Instruction Format – Addressing modes – Motorola 68000 I/O   Advanced Microprocessor – Pentium: Architecture and Addressing Modes.

UNIT - V

Peripheral Interfacing: Parallel versus Serial Transmission – Synchronous and Asynchronous Serial Data Transmission- Interfacing of Hexa Decimal Keyboard and Display unit to microprocessor – CRT (Cathode Ray Tube) Terminal Interfacing to a microprocessor- Applications of Microprocessor: A Temperature Monitoring System – Automotive Applications.

TEXT BOOKS
1. M.Rafiquzzaman, "Microprocessors Theory and Applications : Intel and Motorola", Prentice Hall India, Revised Edition, 2004.
2. Aditya P. Mathur, "Introduction to Microprocessors", Tata McGraw Hill, Third Edition, 1990.

REFERENCE BOOKS:
1. R.S.Gaonkar, "Microprocessor Architecture,programming and Applications with the 8085", 1995.
2. M.Rafiquzzaman, "Microprocessor and MicroComputerBased System Design",UBS, 1995.
3. N.K.Srinath, "8085 Microprocessor Programming and Interfacing",PHI.

08PCA08 DATABASE MANAGEMENT SYSTEMS

4 Credits

UNIT – I

File Systems and Databases: Introducing the Database – The Historical Roots of the Database: Files and File Systems – A File System Critique – Database Systems – Database Models – Wrap-Up: The Evolution of Data Models. The Relational Database Model: A Logical view of data – Keys – Integrity Rules Revisited – Relational Database Operators – The Data Dictionary and the System Catalog – Relationships Within the Relational Database – Data Redundancy Revisited.

UNIT – II

Entity Relationship (E-R) Modeling: Basic Modeling Concepts – Data Models: Degrees of data Abstraction – The Entity Relationship (E-R) Model – Normalization of Database Tables: Database Tables and Normalization – Higher-Level Normal Forms – Denormalization.

UNIT – III

Relational Databases: Structured Query Language – Other Relational Languages - Transaction Management and Concurrency Control: What is a Transaction – Concurrency Control – Concurrency Control with Locking Methods – Concurrency Control with Time Stamping Methods – Concurrency Control with Optimistic Methods – Database Recovery Management. Distributed Database Management Systems: The Evolution of Distributed Database Management Systems – Distributed Processing and Distributed Databases – Functions of Distributed Database Management System-DDBMS Components – Levels of Data and Process Distribution – Distributed Database Transparency Features – Distribution Transparency – Transaction Transparency – Performance Transparency and Query Optimization – Distributed Database Design – Data Fragmentation – Data Replication – Data Allocation – Client/Server vs. DDBMS – C.J. Date's Twelve Commandments for Distributed Databases.

UNIT – IV

Query Processing: Overview – Measures of Query Cost – Selection Operation – Sorting – Join Operation – Other Operations – Evaluation of Expressions. Query Optimization: Overview – Estimating Statistics of Expression Results – Transformation of Relational Expressions – Choice of Evaluation Plans – Materialized Views. Distributed Databases: Homogeneous and Heterogeneous Databases – Distributed Data Storage – Distributed Transactions – Commit Protocols – Concurrency control in Distributed Databases – Availability – Distributed Query Processing – Heterogeneous Distributed Databases – Directory Systems.

UNIT – V

Object Oriented Databases: Object-Oriented Concepts - Characteristics of an Object-Oriented Data Model – OODM and Previous Data Models: Similarities and Differences – Object-Oriented Database Management Systems – How Object Orientation Affects Database Design – OODBMS: Advantages and Disadvantages – OO Concepts in Relational Model – The Next Generation of Database Management Systems. Advanced Data Types and New Applications: Motivation – Time in Databases – Spatial and Geographic data – Multimedia Databases – Mobility and Personal Databases.

TEXT BOOKS:

1. Peter Rob Carlos Coronel, "Database Systems – Design, Implementation and Management ", Thomson Course Technology, Fifth Edition – 2002. (Units I, II, III & IV).
2. Abraham Silberschatz, Henry F.Korth, S.Sudarshan, "Database System Concepts", McGraw-Hill, Fourth Edition-2002. (Units IV & V)

REFERENCE BOOKS:
1. Alexis Leon, Mathews Leon, "Essentials of Database Managements Systems", Vijay Nicole imprints PVT LTD, 2006.
2. C.J.Date, "An Introduction to Database Systems", 7th Edition, Pearson.
3. Raghu Ramakrishnan and Johannes gehrke, "Database Mangement System", Mc Graw Hill, 2000.
4. Gerald V.Post, "Database Management Systems –Designing & Building Business Applications", Mc Graw Hill, 2000.

08PCA09 DESIGN AND ANALYSIS OF ALGORITHMS
4 Credits

UNIT - I

Introduction – Performance Analysis. Divide and conquer Method: Binary Search, Finding Maximum and Minimum, Merge Sort and Quick Sort.

UNIT - II

Greedy Methods: Knapsack Problem, Minimum Cost Spanning Trees, Optimal Storage on Tapes and Single Source Shortest Path Problem.

UNIT - III

Dynamic Programming: Multistage Graphs, 0/1 knapsack and Traveling Salesman Problem. Basic Traversal and Search Techniques: Techniques for Binary Tree, Techniques for Graphs: Depth First Search and Breadth First Search - Connected Components and Spanning Tree - Biconnected Components and DFS.

UNIT - IV

Backtracking: 8 Queens Problems, Sum of Subsets, Graph Colouring, Hamiltonian Cycle and Knapsack Problem.

UNIT - V

Branch and Bound: 0/1 Knapsack Problem, Travelling Salesman Problem. Least Cost Search, 15 Puzzle Problem, FIFO Branch and Bound and LC Branch and Bound.

TEXT BOOK

1. E.Horowitz and S.Sahani, "Fundamentals of Computer Algorithms", Galgotia, 1985.

REFERENCE BOOKS

1. S. K. Basu, "Design Methods and Analysis of Algorithms", PHI, 2005.

2. Goodman and S. T. Hedetniem, "Introduction to the Design and Analysis of Algorithms", MGH, 1977.

3. A.V. Aho, J.D. Ullman and J.E.Hospcraft, "The Design and Analysis of Computer Algorithms", Pearson Education.

08PCAP03 OBJECT ORIENTED PROGRAMMING LAB

2 Credits

Implement the following using C++:

1. Matrix Manipulation.

2. Implementation of stack using Arrays.

3. Implementation of queue using Arrays.

4. Implementation of Linear Linked List and its Operations.

5. Write a program to convert infix to postfix expressions using arrays.

6. Write a program to add two polynomials using pointers.

Implement the following using JAVA:

1. Classes and objects.

2. Arrays.

3. Inheritance.

4. Packages and Interfaces.

5. Exception Handling.

6. Threads.

7. Simple applet programs.

08PCAP04   RELATIONAL DATA BASE MANAGEMENT SYSTEM LAB
2 Credits

1. Creation of tables   executing All Queries.

   PACKAGES IN D2K.

2. Library Management systems.

3. Payroll.

4. Tourist Information System.

5. Banking System.

6.

Note: **Use Triggers, Procedures, Menus and Reports.**

SEMESTER III
08PCAP10 VISUAL PROGRAMMING

4 Credits

UNIT - I

Windows Programming: Basic- Windows and Messages -An Introduction to GDI-Scroll bars- Keystroke Messages-Character Messages-Keyboard Messages -The Mouse: Mouse Basics-Client-Area Mouse Messages-Non Client-Area Mouse Messages-Capturing the Mouse- Dialog Boxes: Modal Dialog Boxes-Modeless Dialog Boxes.

UNIT - II

Visual Basic: introduction – Forms – Common form properties- scale properties – color properties – Events – Toolbox – Creating control – the name property – command buttons: properties – events- Image controls- Textboxes – labels – message box- grid-Data types – variables – picture box – rich text box- functions and procedures- control arrays – list and combo boxes – Flex grid control.

UNIT – III

Common dialog boxes - Microsoft windows common controls- Menus- MDI forms – Mouse event procedures- Basic File Handling: File commands – Sequential files – random access files – Binary files – Sharing files- File system controls and file system objects- Overview of COM/OLE – Methods and events for data control.

UNIT-IV

Windows Programming Foundations - Concepts and Tools for Windows Applications. Procedure-Oriented Windows Applications - The Microsoft Foundation Class Library: Fundamentals - Windows Applications Using the MFC. Visual C++ Basics- An Introduction to Visual C++ - Building a Basic Application - Understanding Visual C++ Resources.

UNIT – V

Visual C++ and Database Management. ADO (Active Data Objects) versus ODBC (Open Database Connectivity)- Database Building Overview- Building a Database Application Using ODBC. Building a Database Application Using DAO - Creating an ActiveX Control.

TEXT BOOKS:
1. Charles Petzold, "Programming Windows", Microsoft Press, Fifth Edition. (Unit – I Ch.1,3,5,6,7,9,11)
2. Gary Cornell, "Visual Basic 6 from the ground up", TMH, 2005 (Unit II Ch.3, 4,5,6,9,11,14,17,18,19,20,22)
3. Pappas, Chris; Murray, William, "Visual C++ 6: The Complete Reference", Ist edition,1999, (Unit – IV, Part- IV)
4. Mueller, John, "Visual C++ 6 from the Ground Up", TMH, 2nd edn,1999(Unit – IV Ch.1,2,3 Unit – V Ch. 4,5,6,7,10)

REFERENCE BOOKS:

1. Steven Holzner , "Visual C++ 6", BPB publications, 2002.
2. Yashavant P.Kanetkar, "Visual C++ programming", BPB Publications, 2002
3. James Allert, "Visual C++ Programming", Cengage Learning, India edition, 2009.
4. Diane Zak, "Visual Basic 2008", Cengage Learning, India Edition, 2008

08PCA11- OPERATING SYSTEMS

4 Credits

UNIT-I
INTRODUCTION : Definition of OS-Mainframe System-Desktop Systems-Multi processor System-Distributed-Clustered-Real time Systems-Handheld Systems-Operating System Structure-System Components-Services-System Calls-System Programs-System Design and Implementation

UNIT-II
PROCESS MANAGEMENT : Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling

UNIT-III
PROCESS SYNCHRONIZATION : Critical Section-Synchronization Hardware-Semaphores-Problems of Synchronization-Critical Regions-Monitors-Deadlocks-Characterization-Handling Deadlocks-Deadlock Prevention-Avoidance-Detection-Deadlock Recovery

UNIT-IV
MEMORY MANAGEMENT : Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contigous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets

UNIT-V
I/O AND FILE SYSTEMS: Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

TEXT BOOK

1. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCES
1. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992
2. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004
3. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

08PCA12-SOFTWARE ENGINEERING

UNIT – I

A Generic View of Process – Process Models-The Waterfall Model-Incremental Model-Evolutionary Model-Specialized Model-The Unified Process–Agile Process – Agile Models – Software Engineering practice-planning and modeling practice.

UNIT – II

REQUIREMENT ENGINNERING: Requirement engineering tasks - Initiating the Process-Eliciting Requirements-Developing Use Cases-Negotiating Requirements-Validating Requirements – Building the Analysis Models: Concepts

UNIT – III

SOFTWARE DESIGN: Design Process-Design Concepts – Design Models – Pattern Based Design – Software Architectural – Data Design – Component – Designing class based components

UNIT – IV

SOFTWARE TESTING: Software Testing Strategies- Strategic Issues- test Strategies for conventional software- strategies for object oriented software- validation testing-system testing – Art of debugging - Testing Tactics: Testing Fundamentals-Black Box – While Box – Basis Path-Control Structure

UNIT - V

SCM AND QUALITY ASSURANCE: Software quality- frame work of Product metrics- analysis model – Design model – Metrics for source code – metrics for Testing – maintenances Quality Management: Quality concepts – Software Quality Assurances – Software reviews – formal technique review- Formal approaches to SQA- Software Reliability

TEXT BOOKS
1. Roger Pressman.S., "Software Engineering: A Practitioner's Approach", 6th Edition, Mcgraw Hill, 2005.
   (Chapters 2,3,4,5, 7, 8.1, 8.2, 9, 10.1, 10.2, 11.1, 11.2,13, 14.1, 14.2, 14.3, 14.4,14.5, 15, 26)

REFERENCES
1. P. Fleeger, "Software Engineering", Prentice Hall, 1999.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall of India 1991.
3. Sommerville, "Software Engineering", 5th Edition: Addison Wesley, 1996.

8PCA13 OPTIMIZATION TECHNIQUES

4 Credits

UNIT - I   Linear Programming
Introduction-Concept of Linear Programming   Model-Development of   Linear Programming Models-Graphical Method-Simplex Method-Big M Method-Dual Simplex Method-Two Phase Method.   Duality: Formulation of Dual Problem-Application of Duality.

UNIT – II   Transportation and Assignment Problem
Introduction-Mathematical Model of Transportation Problem-Types of Transportation Problem-Methods to solve Transportation problem. Assignment problem: Introduction-Zero-One Programming Model-types of Assignment problem-Hungerian Method.

UNIT – III   Inventory Control
Introduction-Models of inventory-Implementation of purchase inventory model-EOQ Model for multi-item joint replenishment.

UNIT – IV   Production Scheduling
Introduction-Single Machine Scheduling: Measures of Performance-Shortest Processing Time Rule to Minimize Mean Flow Time-Weighted Shortest Processing Time rule to minimize weighted mean flow time-Earliest Due Date rule to Minimize Maximum Lateness-Model to Minimize total Tardiness. Flow Shop Scheduling: Johnson's Algorithm for n jobs and Two Machines problem-Extension of Johnson's Algorithm for n jobs an Three Machines problem-Job Shop Scheduling.

UNIT – V   Queueing Models
Introduction-Terminologies of Queueing System-Empirical Queueing Model: (M/M/1) : (GD/∞/∞) Model-(M/M/C) : (GD/∞/∞) Model-(M/M/1) : (GD/N/∞). Simulation: Need for Simulation-Types of Simulation-Major Steps of simulation-simulation using high-level languages.

TEXT BOOK:
1. Pannerselvam. R., Operations Research, Second Edition, PHI Learning Private Limited, 2008. (Chapters: 2.1 – 2.5, 2.7, 3.1 – 3.4, 4.1 - 4.4, 7.1, 7.2, 7.5, 7.8, 9.1, 9.2, 9.3.1-9.3.3, 9.4.1-9.4.4, 14.1, 14.2.1 – 14.2.5, 14.3.1, 14.3.2, 14.4.1)

REFERENCE BOOKS:

1. Nita H Shah, Ravi M. Gor, Hardik Soni, Operations Research, Prentice-Hall of India, 2008.
2. Srinivasan. G., Operations Research, PHI, 2008.
   Wayne L. Winston, Operations Research, Cengage Learning, 2009

08PCAP05 VISUAL PROGRAMMING LAB

2 Credits

VISUAL BASIC

1. Design a calculator.
2. Preparation of student mark list
3. Reservation system (bus or train)
4. Bank management system.
5. Hospital management system.

Visual C++
1. Writing code for keyboard and mouse events.
2. Creating Dialog based applications
3. Crating SDI applications
4. Creating MDI applications
5. Creating applications using common dialog controls.
6. Simple data base application.
7. Graphics and animation.

08PCAP06 OPERATING SYSTEMS LAB

2 Credits

1. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS. Compute and print the average waiting time and average turnaround time.
2. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for SJF. Compute and print the average waiting time and average turnaround time.

3. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority . Compute and print the average waiting time and average turnaround time.
4. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Round robin. Compute and print the average waiting time and average turnaround time.
5. Implement the Producer – Consumer problem using semaphores.
6. Implement Least Recently Used page replacement Algorithm.
7. Simulate sequential file allocation strategies
8. Simulate single level directory File organization techniques.
9. Simulate Bankers Algorithm for Dead Lock Avoidance
10. Simulate Bankers Algorithm for Dead Lock Prevention.

SEMESTER IV
08PCA14 COMPUTER GRAPHICS

4 Credits

UNIT – I
Basic concepts: Introduction – Origins of Computer Graphics – Working of Interactive Graphics display – Video display devices – Raster Scan System – Random Scan System – Input Devices – Hard Copy devices – Graphics Software. Output Primitives : Points and Lines – Line – Drawing Algorithms – Circle Generating Algorithm – Ellipse Generating Algorithms – Filled Area Primitives.

UNIT – II
Attributes of Output Primitives: Line attributes – Curve attributes – Color and Gray scale levels – Area fill attributes – Antialiasing. Two Dimensional Geometric Transformation: Basic Transformation – Matrix Representation – Composite Transformation – Other Transformation.

UNIT – III
Two Dimensional Viewing : The viewing pipeline – Viewing Co-ordinate reference frame – Window to view port co–ordinate transformation – Two dimensional viewing function – Clipping Operations – Point clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping. Three Dimensional Concepts : Three Dimensional Display Methods – Three Dimensional Graphics Packages. Three Dimensional Geometric and modeling Transformation – Translation – Rotation – Scaling – Other Transformation – Composite Transformation. Three Dimensional Viewing: Viewing Pipeline – Viewing Co-ordinates – Projections – Clipping.

UNIT – IV
Graphical User Interfaces and Interactive input methods: The user dialogue – Input of Graphical data – Input function – Interactive Picture Construction techniques. Illumination models and Surface – Rendering method : Light Sources – Basic Illumination models – Displaying light intensities – Halftone Patterns and Dithering techniques – Polygon rendering method.

UNIT – V
Image manipulation and storage: What is an Image? Filtering – Image processing – Geometric Transformations of Images – Multipass Transformation – Image Compositing – Mechanism for image storage – Special effect with images. Advanced modeling Techniques – Procedural models – Fractal models – Grammar Based models- particle systems – Physically Based modeling – Special model for Natural and Synthetic objects – Automating object placement. Animation : Conventional and Computer assisted animation – Animation languages – Methods of controlling animation – Basic rules of animation - problems peculiar to animation.

TEXT BOOK

1. Donald Hearn and M. Pauline Baker, "Computer Graphics", Second Edition, Prentice-Hall of India Private Limited.
   (Chapters : 2.1,2.5-2.7,3.1,3.2,3.5,3.6,3.11,4.1-4.4,4.8,5.1-5.4,6.1-6.11,9.1,9.2,11.1-11.5,12.1-12.3,12.5,8.1-8.3,8.5,14.1-14.5)

2. James D.Foley, Andries Van Dam, Steven K.Feiner and John F.Hughes, "Computer Grraphics Principles and Practice" Second Edition in C, Pearson Education Asia.
   (Chapters: 17.1-17.8, 20.2-20.5, 20.7-20.9, 21.1-21.5)

REFERENCE BOOK
1. William M. Newman and Robert F. Sproull "Principles of Interactive Computer Graphics" Second Edition, Tata McGraw – Hill Edition.

2. Steven Harrington, "Computer Graphics A Programming Approach", Second Edition, McGraw – Hill International Edition.

08PCA15   COMPUTER NETWORKS

4 Credits

UNIT – I

Introduction – Uses of computer networks – Network hardware: LAN-MAN-WAN – Networks Software: Protocol hierarchies – Reference models: OSI-TCP/IP.
The Physical Layer: Guided transmission media- The public switched telephone network: Structure of the telephone system – Switching.

UNIT – II

The Data Link Layer: Design issues –Error detection and correction – elementary data link protocol – Sliding window protocol – HDLC.
The Medium Access Control Sub Layer: Multiple access protocol: CSMA protocol – collision free protocol – Data link layer switching: Repeaters, Hub, Bridges, Switches, Router, and gateways - Bluetooth.

UNIT – III

The Network Layer: Design issues – Routing algorithms: Optimality principle – Shortest path – Distance Vector – link state – Hierarchal – Broadcasting – Congestion control algorithms – The network layer in internet: IP protocol – IP address.

UNIT – IV

The Transport Layer: The transport service: service provided to the upper layer – Transport service primitives – Berkeley sockets - Elements of transport protocols – The internet transport protocol : UDP: Introduction – RPC - TCP: Service model – TCP segment header.
The Application Layer: DNS – E-Mail: Architecture and services – Message formats - WWW : Architectural overview.

UNIT – V

Network Security: Cryptography: introduction – Substitution and transposition cipher – Symmetric-key algorithm: DES – public-key algorithms: RSA – Digital signature: symmetric and public key signature – Communication security: IPsec – firewalls – VPN. Authentication protocol: Authentication based on shared key – Diffie-hellman key exchange – Email security: PGP – PEM – Web Security: Threats – secure naming – SSL.

TEXT BOOKS:
1.   Andrew S. Tanenbaum, "Computer Networks**", 4th edition** by, 2003 PHI.
(For UNIT – I, Chapters 1.1, 1.2, 1.3, 1.4 2.2, 2.5 , For UNIT – II, Chapters 3.1, 3.2, 3.3, 3.4, 3.6, 4.1, 4.2, 4.6, 4.7, For UNIT – III, Chapters 5.1, 5.2, 5.3, 5.6, For UNIT – IV, Chapters 6.1, 6.2, 6.4, 6.5 7.1, 7.2, 7.3, For UNIT – V, Chapters 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 8.9)
REFERENCE:
1. William Stallings, " Data and Computer Communication", **5th edition**, PHI.
2. Behrouz A. Forouzan, " Data Communications and Networking", **3rd edition** Tata McGraw-hill.

08PCA16 ADVANCED JAVA PROGRAMMING

4 Credits

UNIT -I
Java Beans - Java Beans component model – Creating a Java Bean class – Exploring Java Bean property types- Adding custom Event types – Creating Java Bean class with events – Using the BeanInfo classes.

UNIT - II
Network Programming – Working with URLs – Working with sockets-Remote method invocation

UNIT –III
Using Relational Databases – JDBC Drivers for RDBM systems – SQL to Java Type Mappings –Using Java. Sql API .

UNIT -IV
Building web Applications - J2EE web application packaging – Servlets – The Servlet API – Java server pages – JSP tags and API –Java coding in JSPs

UNIT- V
Enterprise javabeans: Introduction – enterprise programming – session EJBs – EJB clients – entity EJBs – message driven beans.

TEXT BOOKS
1. Joe Wigglesworth and Paula McMillan, "Java Programming : Advanced Topics" Thomson Learning Inc -2007. Chapters 8,9,11,13

REFERENCE BOOKS

1. Keyur shah, "Gateway to Java Programmer Sun Certification", Tata Mc Graw Hill,2002.

2. Deitel & Deitel, Java How to Program, Prentice Hall,1999.
3.
4. Phil Kanna," The Complete Reference JSP 2.0", Tata McGrawHill publishing Company Ltd,2003.

4. Jim Keogh," The Complete Reference J2EE", Tata McGrawHill Publishing Company Ltd,2002.

5. D.S. Malik, Robert P. Burton,"Programming with Java- Guided Learning with Early objects, Cengage Learning India Private India – New Delhi – 2009.

08PCA17 MULTIMEDIA & VIRTUAL REALITY

4 Credits

UNIT-I
Multimedia- Introduction to making Multimedia – Multimedia skills -   Hardware – Basic Software Tools – Multimedia authoring tools.

UNIT-II
Multimedia Elements: Text - Sound – Image - Animation– Video: Introduction – Analog Display Standards – Digital Display Standards – Digital Video – Video Recording and tape formats – Shooting and Editing video.

UNIT-III
The Internet and How it Works: Internet History – Internetworking – Connections – Internet Services – The WWW and HTML – Dynamic Web Pages and XML – Multimedia on the Web – Tools for the WWW – Multimedia Application Development : Designing for the WWW – Planning and Costing – Designing and Producing – Content and Talent - Delivering.

UNIT-IV
Virtual Reality: Introduction - Input Devices: Trackers, Navigation and Gesture Interfaces - Output Devices: Graphics, Three-Dimensional sound and Haptic Displays.

UNIT-V
Architecture of VR: PC Graphics Architecture - Workstation based architecture – Distributed VR architecture – Modeling: Geometric Modeling – Kinematics modeling-Physical modeling – Behavior Modeling - VR Programming – Traditional VR Applications- Emerging applications of VR.

TEXT BOOKS
1. Tay Vaughan, Multimedia Making it work, Seventh Edition, Tata McGraw-Hill Edition, Sixth Reprint 2008 (Unit - I: 1, 2, 3, 9, 10, 11 Unit - II: 4, 5, 6, 7, 8 Unit - III: 12, 13, 14, 15, 16, 17, 18)
2. Virtual Reality,"Grigore C. Burdea, Philippe Coiffet", Second Edition, A John Wiley & Sons, Inc., Publication 2006.
(Unit - IV: 1, 2, 3 Unit - V: 4, 4.2, 4.3, 4.4, 5, 5.1, 5.2, 5.3, 5.4, 6 , 8, 9)

REFERENCE BOOKS
1. Ranjan Parekh, Principles of Multimedia, Tata McGraw Hill Publishing Company Limited, 2009.
2. James E. Shuman, Multimedia in Action, Wadsworth Cengage Learning, 2008
3. John Vince, Virtual Reality Systems, Pearson Education 2008

08PCAP07 ADVANCED JAVA PROGRAMMING LAB

2 Credits

Write Programs to implement the following:

1. Program for Event Handling (Mouse, Key Events, Text Events etc)
2. Program for accessing database using JDBC
3. Program for updation of database using JDBC.
4. Program using Servlets.
5. Program using Java Server Pages.
6. Program for creation for Beans.
7. Program for Remote Method Invocation.
8. Program for implementation of UDP.
9. Program for implementation of TCP/IP.

SEMESTER V
08PCA18 E-TECHNOLOGIES

4 Credits

UNIT – I
Introduction to Electronic Commerce: Electronic Commerce– Business Models, Revenue Models, and Business Processes – Economic Forces and Electronic Commerce – Identifying Electronic Commerce Opportunities – International Nature of Electronic Commerce. **Technology Infrastructure**: The Internet and the Word Wide Web– Internet and World Wide Web – Packet – Switched Networks – Internet Protocols – Markup Languages and the Web – Intranets and Extranets – Internet Connection Options - Internet2 and The Semantic Web. **The Environment of Electronic Commerce:** Legal, Ethical and Tax issues.

UNIT – II
Selling on the Web: Revenue Models and Building a Web Presence – Marketing on the Web - Business– to – **Business Strategies:** From Electronic Data Interchange to Electronic Commerce –Online Auctions, Virtual Communities and **Web Protocols:**– Auction Overview – Online Auctions and Related Business – Virtual Communities and Web Portals.

UNIT – III
Web Server Hardware and Software: – Software for Web Servers – Electronic Mail (E-Mail) – Web Site and Internet Utility Programs – Web Server Hardware. **Electronic Commerce Software**: Basic Functions of Electronic Commerce Software – Advanced Functions of Electronic Commerce Software – Electronic Commerce Software for Small and Midsize Companies – Electronic Commerce Software for Midsize to Large Businesses – Electronic Commerce for Large Businesses. **Electronic Commerce Security:** -Payment Systems for Electronic Commerce-Planning for Electronic commerce.

UNIT – IV
E- Marketing: Traditional Marketing – Identifying Web Presence Goals – The Browsing Behavior Model – Online Marketing – E-Advertising - Internet Marketing Trends – Target Markets – E-Branding – Marketing Strategies. - E-security – **E-Payment Systems:** E-Customer Relationship Management: E Supply Chain Management.

UNIT – V
E-Strategy: Information and Strategy – The Virtual Value Chain – Seven Dimensions of E-Commerce Strategy – Value Chain and E-Strategy – Planning the E-Commerce Project – E – Commerce Strategy and Knowledge Management – E-Business Strategy and Data Warehousing and Data mining.**Mobile Commerce:**– Wireless Applications – Technologies for Mobile Commerce– WAP Programming Model – Wireless Technologies – Different Generations in Wireless Communication – Security issues Pertaining to Cellular Technology –M-Commerce in India. Customer – **Effective Web Design:**-Legal and Ethical Issues.

TEXT BOOKS:-
1. Gary P. Schneider, E-Commerce Strategy, Technology and Implementation, CENGAGE Learning INDIA Private Limited,. Reprint 2008 (Unit-I: Chapter 1,2,3 Unit-II: Chapter 4,5,6,7, & III Chapter – 8,9,10,11,12).
2. P.T. JOSEPH, E-Commerce an Indian Perspective Third Edition Prentice Hall of India, (Unit-IV: Chapter 4,5,6,7,8 & V – Chapter 9,10,11,12).

REFERENCE BOOKS:
1. Mike Papazologn, E-Business, Organizational and Technical Foundations, Wiley India Pvt Ltd, 2008
2. Elias M. Awad, Electronic Commerce, Prentice-Hall of India, 2008
3. Kenneth C.Laudon, Carlo Guercio Traver E- Commerce-business, technology, society, Pearson Education 2009.

8PCA19   .NET PROGRAMMING

4 Credits

UNIT – I

Microsoft .NET Framework - . NET vision – The .NET Framework classes – Executing code – Common Language Runtime – Common Type system and Common Language specification – Visual studio .NET IDE – Tool box – Modified Hungarian Notation – Code Editor _ Using the Help system

UNIT – II

Visual Basic .NET – Visual Basic .NET IDE – The Profile set up page- Project tab – Menu – Tool bars – Variables – Data types – Comments – Methods – Controlling the flow – if statement – select case – Loops – Arrays – Constants – Structures – Collections and Lists – Look up Tables and Hash table – Dynamic arrays

UNIT – III

Building Windows Applications – Displaying dialog boxes – Creating Menus – Debugging and Error Handling – Accessing databases – Database Programming with SQL server and ADO .NET – Web forms

UNIT – IV

ASP .NET – Introducing web developer tools – Introduction to ASP .NET server Programming – Using variables and constants in web forms – Working with web objects to store data – Designing .NET web Applications –Programming with Visual Basic .NET – Advanced web controls – Managing data with ASP .NET

UNIT – V

C# Programming – Evolution of C# and .NET – Why C# - Elements of C# program – Programming Example – Data types and Expressions – Making decisions – Repeating Instructions – Arrays and Collection – Controls – Programming based on events – Database access with ADO .NET

TEXT BOOKS
1. Barbara Doyle, Programming in C#, Cengage Learning publications –I Edition – 2008
2. Thearon Willis , Jonathan Crossland, Richars Blair, Beginning VB .NET 2003, Wiley Dreamtech publishers – 2004 edition
3. Kathleen Kalata , Web Applications using ASP .NET 2.0 - Cengage Learning publications.

REFERENCE BOOKS
1. "Understanding .NET", David Chappell, Pearson education, 2002
2. "Introducing Microsoft .Net", David.S.Platt, PHI, 2003.
3. Microsoft ASP .NET Programming with Microsoft Visual C# .NET step by step , G.Andrw Duthie,PHI ,2003.
4. George Shepherd, "Microsoft ASP .NET 3.5", PHI, New Delhi, 2008.

08PCA20 WEB TECHNOLOGIES

4 Credits

UNIT - I
HTML: introduction - Common tags: List, Tables, images, forms, Frames; Cascading Style sheets. Document Object model and collection-event handling Filter and transitions

UNIT - II
XML: Introduction, displaying an XML Document, Data interchange with an XML Document, Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT - III
Introduction to JavaScript - History -working with variables and data - syntax and statements-operators and expression- conditional and looping statements-functions

UNIT - IV
Objects in java script- document object model- using java script with web forms-creating and consuming cookies-browsers and JavaScript- JavaScript and CSS

UNIT-V
JavaScript and XML-Loading XML document with JavaScript-Introduction to AJAX: XMLHttpRequest Object -AJAX request- AJAX Responses-XML Responses-Creating an HTML tables with XML and CSS

TEXT BOOKS
1. Burdman, "Collaborative Web Development", Addison Wesley.

2. Steve Suehring "JavaScript step by step" Prentice-Hall of India Private Limited, 2008 (For Unit III - IV, Chapters 1, 4, 5, 6, 7, 9, 11, 12, 14, and 15)
(For Unit V, Chapters 17, 18)

REFERENCE BOOK:

1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech.
2. Ed Wilson, "Microsoft VB Script Step by Step", PHI, New Delhi, 2008.

08PCAP09 .NET PROGRAMMING LAB

2 Credits

Write programs to implement the following:

1. Create a simple application in Visual Basic .Net.

2. Create and manage multiple forms in a simple application.

3. Interact with a user by using the message box function.

4. Using static variables.

5. a. Creating a structure.

   b. Creating and using arrays.

6. Creating functions and procedures.

7. Validating user input.

8. a. Create a new class, including its methods, properties, and data members with appropriate access levels.

   b. Create and use an instance of a class, including instance and shared data members, and shared and non-shared methods.

9. Using Try….Catch….Finally Blocks.

10. a. Create custom menus to group application commands.

    b. Create a status bar to provide users with feedback about an application.

    c. Create a toolbar to provide a graphical interface with which users can access key functions of an application.

11. Create, build, and run an application that uses web forms.

12. a. Create and open a connection o a database.

    b. Create, read, update, and delete records in a database.

    c. Use the data form wizard to create a simple data access application.

    d. Display and modify data extracted from a database.

08PCAP10 WEB PROGRAMMING LAB

2 Credits

1. Develop static pages (using Only HTML) of an online Book store. The pages should resemble:
   www.amazon.com The website should consist the following pages.
   * Home page
   *Registration and user Login
   * User Profile Page

2. Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

3. Write a program to use XML and JavaScript for creation of your homepage.

4. Write a program in XML for creation of DTD which specifies a particular set of rules.

5. Create a Stylesheet in CSS/XSL and display the document in Web Browser.

6. Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

7. Write a JavaScriptProgram, embedded in an HTML web page, to play a simple game.

8. Create a script that collects numbers from a page and then adds them up and prints them to a blank field on the page.

9. Create a script that prompts the user for a number and then counts from 1 to that number displaying only the odd numbers

10. Implement Client Side form validation using JavaScript

11. Create a web page to handle events and objects using JavaScript.

ELECTIVE I

08PCAZ01 COMPILER DESIGN

4 Credits

UNIT - I

Compiler - Phases of Compiler – Compiler writing tools – Lexical Analysis – Role of Lexical analyzer – specification and reorganization of tokens -Finite Automata – Regular Expression – From a Regular expression to an NFA , NFA to DFA – Design of Lexical Analyzer.

UNIT - II

Syntax Analyzer – CFG – Role of the Parser – CFG – Top Down Parsing – Recursive descent parsing, predictive Parsers – Bottom up Parsing – Shift reduce, operator precedence parsers, LR Parsers.

UNIT -III

Syntax directed definition : Construction of Syntax trees – Intermediate code generation : Intermediate Languages – Syntax trees, post fix form, Three address code – Boolean expressions – Back Patching.

UNIT - IV

Symbol table – contents of Symbol table – Data Structures for Symbol table – Runtime storage Administration – Implementation of Stack allocation scheme block structured Languages – Storage allocation in Fortran.

UNIT -V

 Code Optimization and code generation – principles sources of optimization – loop optimization – DAG Representation of Basic blocks. Code generation – problems in code generation – a simple code generator – Register allocation and Assignment – Peephole optimization.

TEXT BOOKS
1. Alfred V.Aho, Ravi Sethi, Jeffrey D.Ullman Compilers Principles, Techniques and Tools,., Pearson Eduction, 2nd Edition , 2008
2. Alfred V.Aho and Jeffrey D.Ullman ,Principles of Compiler Design ,.

08PCAZ02 OBJECT ORIENTED ANALYSIS AND DESIGN

4 Credits

UNIT – I
The Object Model: The Evolution of the Object Model – Elements of the Object Model – Applying the Object Model. Classes and Objects: The Nature of an Object – Relationships among Objects – The Nature of a Class – Relationships among Classes – The Interplay of Classes and Objects – Building Quality Classes and Objects.

UNIT – II
Classification: The importance of Proper Classification – Identifying Classes and Objects – Key Abstractions and Mechanisms. The Notation: Elements of the Notation- Class Diagrams – State Transition Diagrams.

UNIT – III
Object Diagrams – Interaction Diagrams – Module Diagrams – Process Diagrams – Applying the Notation. The Process: Principles – Micro Development Process – Macro Development Process.

UNIT – IV
Design Patterns: Creational – Structural – Behavioural Patterns. Pragmatics: Management an Planning – Staffing – Release Management – Reuse – Quality Assurance and Metrics – Documentation – Tools – The benefits and Risks of Object – Oriented Development.

UNIT – V
Object Oriented Programming Languages - Case Studies: Weather Monitoring Station - Inventory Tracking – Traffic Management.

TEXT BOOK
1. Grady Booch , "Object Oriented Analysis and Design",Second Edition, Pearson Education (Chapters:2,3,4,5,6,7,8,10,12)
2. Mahesh P. Matha,"Object – Oriented Analysis and design using UML An Introduction to Unified Process and Design Patterns", Prentice-Hall of India Pvt. Ltd. (Chapters: 8,9,10)

REFERENCE BOOK
1. Martin Fowler, "UML Distilled A Brief Guide to the Standard Object Modeling Lanaguage" Third Edition, Pearson Education.
2. James Rumbaugh et al, "Object Oriented Modeling and Design", Pearson Education.

08PCAZ03 PARALLEL PROCESSING

4 Credits

UNIT – I

Parallel Machines and Computations – The Evoluation of parallel Architectures – Interconnection Networks – Application of Architectural Parallelism – Getting Started in SIMD and MIMD Programming – Parallelism in Algorithms – Conclusion – Bibliographic Notes – Parameters Characterizing Algorithm Parallelism – Prefix Problem – Parallel Prefix Algorithms – Characterizing Algorithm Behaviour for Large Problem Size – Programming Parallel Prefix – Speedup and Efficiency of Parallel Algorithms – The Performance Perspective.

UNIT – II

Vector And Matrix Algorithms – A Vector Architecture – Single Instruction Multiple Data – An SIMD Instruction Set – The Prime Memory System – Use of the PE Index to Solve Layout Problems – SIMD Language Constructs – Fortran 90 – Pipelined SIMD Vectors Computers – Vector Architecture Summary.

UNIT – III

Shared Memory and Message-Passing Architectures – Overview of Shared Memory Multiprocessor Programming – Shared Memory Programming Alternatives and Scope – A Shared Memory Multiprocessor Programming Language – Pipelined MIMD-Multithreading – Summary and Conclusions – Distributing Data and Operations Among Processor Memory Pairs – Programming With Message Passing – Characterization of Communication – The Message Passing Interface, MPI – Hardware Managed Communication-Distributed Cache .

UNIT – IV

Discovering Parallel Operations in (Sequential) Code – Variables With Complex Names – Sample Compiler Techniques – Data Flow Principles – Data Flow Architectures – Systolic Arrays .

UNIT – V

The Parallel I/O Problem – Hardware for Parallel and I/O – Parallel Access Disk Arrays-RAID – Parallel Formatted I/O in Shared Memory Multiprocessors – Collective I/O in Multiprocessors-MPI-IO – MPI-IO Examples.

Text book
1. Harry F.Jordan, Gita Alaghband , "Parallel Processing" ,Prentice Hall of India - 2008.   Chapters 1,2,3, 5,6,7,9

REFERENCE BOOKS
1. Sasi kumar,Dinesh Shikhare,P.Ravi Prakash, "Introduction to Parallel processing" Prentice Hall of India , New Delhi-2006.
2. Raja raman ,"Elements of Parallel Processing" Prentice Hall of India, New Delhi-2006.
3. Kai Hwang & Faye A.Briggs, "Computer Architecture and Parallel Processing", Prentice Hall of India, 1985.

08PCAZ04 PRINCIPLES OF PROGRAMMING LANGUAGES

4 Credits

UNIT - I

Language Design Issues: History-Role of Programming languages - environments - Impact of machine Architectures - Lnaguage Translation Issues: Programming language Syntax- Stages in Translation - formal Translation models - recursive descent Parsing

UNIT - II

Modeling Language Prpperties: Formal Properties of Languages- Language Semantics- Elementary data Types: Properties of Types and Object- Scalar Data Types - Composite Data Types

UNIT - III

Encapsulation: Structure data types - Abstract data types - Encapsulation by sub programs Type Definitions Inheritance: - Polymorphisms

UNIT -IV

Functional Programming: Programs as Functions- Functional Programming in an Imperative Language - LISP - Functional Programming with static typing - delayed evaluation- Mathematical functional programming- recursive functions and lambda calculus - Logic programming : Logic and Logic Programs - Horn Clauses - Prolog - Problems with logic programming

UNIT - V

Formal Semantics: Sample small language - operational Semantics - Denotation Semantics - Axiomatic Semantics - Program correctness - Parallel Programming: Parallel Processing and programming languages - threads - Semaphore - monitors-message passing - parallelism Non Imperative Languages

TEXT BOOKS :

1. Terrence W Pratt, Marvin V Zelkowitz, Programming Languages - Design and Implementation, PHI Publications, 4th edition, 2008 UNIT - I: Chapters 1, 2, 3, UNIT - II: Chapters 4 , 5, UNIT - III :Chapters 6 , 7

2. Kenneth C. Louden , programming Languages-Principles and Practics , Cengage Learning Publications , 2 Edition, 2008 UNIT -IV : Chapters 11,12, UNIT V : Chapter 13, 14

REFERENCE BOOKS

1. Daniel P Friedman, Mitchell Wand, Christopher T Haynes, Essentials of programming languages, 2 Edition, PHI Publishers, 2005

ELECTIVE II
08PCAZ05 ARTIFICIAL INTELLIGENCE

4 Credits

UNIT - I

INTRODUCTION: Artificial Intelligence - History - Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – formulating problems - example problems – searching for solutions – uniformed search strategies - avoiding repeated states.

UNIT - II

Informed Search methods: Best First Search- Heuriistic functions - Memory bounded Search - Iterative improvement algorithms - game playing - perfect decisions in two person games - imperfect decisions - Alpha beta pruning.

UNIT - III

Knowledge and Reasoning: Knowledge Based Agent - Knowledge representation , reasoning and Logic - First order logic - inference in first order logic: inference rules involving qunatifiers - forward and backward chaining - completeness - relsoution - completeness of resolution.

UNIT - IV

Learning from observations - learning agents - Inductive learning - Learning decision trees - using information theory -   Reinforcement learning: introduction - passive learning - active learning -Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevance information – Inductive logic programming.

UNIT - V

Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TEXT BOOK
1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

REFERENCE BOOKS:
1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.

08PCAZ06 MOBLILE COMPUTING

4 Credits

UNIT - I
Introduction: Advantages of Digital Information **-** Introduction to Telephone Systems – Mobile communication: Need for Mobile Communication – Requirements of Mobile Communication – History of Mobile Communication.

UNIT - II
Introduction to Cellular Mobile Communication – Mobile Communication Standards – Mobility Management – Frequency Management – Cordless Mobile Communication Systems.

UNIT - III
Mobile Computing: History of data networks – Classification of Mobile data networks - CDPD System – Satellites in Mobile Communication: Satellite classification – Global Satellite Communication – Changeover from one satellite to other – Global Mobile Communication – Interferences in Cellular Mobile Communication.

UNIT - IV
Important Parameters of Mobile Communication System – Mobile Internet: Working of Mobile IP – Wireless Network Security – Wireless Local Loop Architecture: Components in WLL – Problems in WLL – Modern Wireless Local Loop – Local Multipoint Distribution Service – Wireless Application Protocol.

UNIT -V
WCDMA Technology and Fibre Optic Microcellular Mobile Communication – Ad hoc Network and Bluetooth technology – Intelligent Mobile Communication system – Fourth Generation Mobile Communication systems.

TEXT BOOK:
1. T.G. Palanivelu, R. Nakkeeran, Wireless and Mobile Communication, PHI Learning Private Limited.2009 (Unit-I: 1, 1.1, 2, 3, 3.1, 3.2, 3.3 Unit-II: 4, 5, 6, 7, 8 Unit-III: 9, 9.1, 9.2, 9.3, 10, 10.1, 10.2, 10.3, 11, 12 Unit-IV: 13, 14, 14.1, 15, 16, 16.1, 16.2, 16.3, 16.4, 17 Unit-V: 18, 19, 20, 21)

REFERENCE BOOK:
1. Jochen Schiller, Mobile Communications, Second Edition, Pearson Education. 2007

08PCAZ07 SOFT COMPTING

4 Credits

UNIT – I: Fundamentals of Neural Networks

Basic Concepts of Neural Network-Model of an Artificial Neuron-Neural Network Architectures-characteristics of Neural Networks-Learning Methods-Taxonomy-History of Neural Network-Early Neural Network Architectures.

UNIT – II: Backpropagation Networks

Architecture of Backpropagation Network-Backpropagation Learing-Illustratrations-applications-Effect of Tuning Parameters of the Backpropagation Neural Network-Selection of various parameters in Backpropagation Neural Network-Variations of Standard Backpropagation algorithms.

UNIT – III: Adaptive Resonance Theory (ART)

Introduction- ART1- ART2-Applications

UNIT – IV: Fuzzy Sets and Systems

Fuzzy Sets-Fuzzy Relations-Fuzzy Logic-Fuzzy Rule based system-Defuzzification Methods-Applications.

UNIT – V: Fuzzy Backpropagation Networks

LR-Type Fuzzy Numbers-Fuzzy Neuron-Fuzzy Backpropagation Architecture- Learning in Fuzzy Backpropagation-inference in Fuzzy Backpropagation-Applications.

TEXT BOOK:
1. Rajasekaran. S and Vijayalakshmi Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, PHI, 2008 (Chapters: 2.1, 2.3-2.9, 3.1-3.7, 5.1-5.4, 6.3, 6.5, 7.3-7.6, 12.1-12.6)

REFERENCE BOOKS:
1. Fakhreddine O. Karray, Clarence De Silva, Soft Computing and Intelligent Systems Design, Pearson, 2009.
2. Sivanandam. S. N and Deepa S. N, Principles of Soft Computing, Wiley India, 2008

08 PCAZ08 ORGANIZATIONAL BEHAVIOR

4 Credits

UNIT-I

Concept of Organizational Behavior: Nature of OB – Organisation Behaviour and similar fields of study – Disciplines contributing OB challenges in OB: Applying OB knowledge to Management practices – Role of OB. Foundation of organizational Behaviour: Scientific management – Fayol's Administration Management – Hawthorne Experiments and Human relations. Individual Dimensions of OB: Personally – perception – Learning – Attitudes and values Emotional intelligence.

UNIT – II

Motivation: Concept – Motivation and Behavior – Motivation and Performance. Theories of Motivation: Maslow's Need Herarchy – Herzberg's Motivation hygiene theory – McGregor's Theory X and Y- Theory Z. Motivation Application: Designing of Reward system – Incentives – Financial Incentive – Non financial Incentives – Empowerment – Quality of work Life – Job Satisfaction.

UNIT –III

Communication: Concept – Process - Two way Communication. Communication Symbols- Oral – written – Non-verbal and Pictorial Communication. Communication Network – Formal and Informal Communication – Direction of Communication flow – Barriers in communication – Making Communication Effective Leadership: Need and Importance – Difference between Leadership and management – Leadership qualities – Leadership styles.

UNIT – IV

Group Dynamics: Concept and Group and Group Dynamics – Formal and Informal Groups – Group Development – Integration of individual and Group – Theories of Group formation – Significance of Informal Group – Dealing with Informal Group – Group Behaviour : External condition – Group member resource – Groups structure – Group process – Group Decision Making : Decision making by committee – positive and Negative Aspect of Group decision making – Techniques for improving Group decision making. Inter group Behaviour.

UNIT – V

Organization structure: Concept organizational structure – need for formal organization structure – Factor in organisational design – mechanism for designing structure – process of Designing structure . Departmentation: Meaning – process- Bases of deparmentation- Span of management – Delegation of Authority – Factors in inadequate Delegation – Making Delegation Effective – Centralization and Decentralization - Form of organization structure : Line – Line and staff – functional – Divisional – Project – Matrix – Free form organization.

TEXT BOOK:
1. M.Prasad, Organisational Behaviour, Sultan Chand & Sons, Reprint edition 2008. (Unit-I: Chapter 1,2,4,5, 6,7, and 8 Unit-II: Chapter 9 and 10 Unit-III: Chapter 16 and 17 Unit-IV: Chapter 13 Unit-V: Chapter 20 and 21.

REFERENCE BOOK:
1. John.W.Slocum Jr.& Don Hellriegel- Fundamentals of organization Behaviour – THOMSON South Western, First Indian Reprint 2007
2. Stephen.P.Ronnins – Essentials of organizational Behaviour – Prentice Hall India (P) Ltd. New Edition.

ELECTIVE III
08PCAZ09 DATA MINING AND WAREHOUSING

4 **Credits**

UNIT - I

Introduction – Data mining – Data mining functionalities – kinds of patterns can be mined – classification – major issues. Data warehouse – A multidimensional data model – Data warehouse architecture – Data warehouse implementation – From data warehouse to data mining.

UNIT - II

Data pre-processing – Data cleaning – Data Integration and Transformation – Data Reduction – Discretization and concept hierarchy generation – Data mining primitives – Data mining Task

UNIT - III

Association Rule Mining – Mining single dimensional Boolean association rules from transactional databases –. Classification and prediction – Issues regarding classification and prediction – Bayesian classification- Classification by Back propagation – classification based on concepts from association rule mining

UNIT - IV

Cluster Analysis – A categorization of Major clustering methods - Partitioning methods-Hierarchical methods – Grid based methods -Model based clustering methods – Density – based methods

UNIT - V

Applications and Trends in Data Mining – Data mining system products and Research prototypes – Additional themes on Data mining – Social Impacts of Data Mining – Trends in Data mining-Mining Spatial Databases – Mining Time-series and sequence data – Mining the World wide web.

TEXT BOOK
1. Jiwei Han, Michelien Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers an Imprint of Elsevier, 2001.
   (Chapters 1,2,3,4.1,6.1,6.2,7,8,9.2,9.4,9.6,10)

REFERENCE BOOKS
1. Arun K.Pujari, "Data Mining Techniques", Universities Press (India) Limited, 2001.
2. George M. Marakas, Modern Data warehousing, Mining and   Visualization: core concepts, Printice Hall, First Edition, 2002.
3. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
4. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008.

08PCAZ10 ENTERPRISE RESOURCE PLANNING

4 Credits

UNIT – I

Introduction to ERP: Evolution of ERP – What is ERP? – Characteristics of ERP – Features of ERP– Need for ERP- Benefits of ERP – Enterprise – an Overview – ERP and related Technologies : Business Process Reengineering – Management Information System – Decision Support System – Executive Information System – Data Warehousing – Data Mining – On-line Analytical Processing(OLAP) – Supply Chain Management.

UNIT – II

ERP- A Manufacturing perspective: Introduction - CAD/CAM - Materials requirement planning - Bill of Material - Closed loop MRP- Manufacturing resource planning – Distribution requirements planning- Production data management - Data management - Process management - Benefits of PDM. ERP Modules: Finance management – manufacturing management - Plant maintenance – Quality management – Materials management – Human resources – Sales and distribution.

UNIT – III

ERP Market: SAP AG – Baan company – Oracle corporation – People soft – JD Edwards world solution's company – QUAD – System software associates Inc. (SSA). ERP Implementation life cycle: Pre-evaluation screening – Package evaluation – Project planning phase – Gap analysis – Re-Engineering – Configuration – Implementation team training – Testing - End – user training – Post Implementation.

UNIT – IV

Selection of ERP: Difficulty in selecting ERP – Approach to ERP selection – "Request For Proposal" approach – Proof of Concept (POC) approach - application of POC approach – Comparison of RFP and POC approach – Analytic Hierarchy Process approach - application of AHP in evaluation of ERP - Vendor , Consultants and Users – Future directions in ERP.

UNIT – V

ERP Resources on the Internet – ERP Case studies

TEXT BOOK

1. Alexis Leon, "Enterprise Resource Planning", 1999, Tata McGraw Hill. (Chapters: 1,2,3,4,5,6,7,8,9,10,11)

2. Ravi Shankar S.Jaiswal, "Enterprise Resource Planning" 1999, Galgotia Publications Pvt. Ltd. (Chapters: 1,9)

REFERENCE BOOK

1. Alexis Leon, "ERP Demystified", 2000, Tata McGraw Hill.

2. Ashim Raj Singla, "Enterprise Resource Planning", 2008, Cengage Learning India Pvt. Ltd. New Delhi.

08PCAZ11 SOFTWARE PROJECT MANAGEMENT
4 Credits

UNIT - I

Project -project management - portfolio management-role of the project manager-project management profession - System view of project management- understanding organizations-stakeholder management- project life cycle

UNIT - II

Project integration management- strategic planning and project selection-project management plans-project execution- monitoring and controlling project work- project Scope planning and management- scope definition and statement-work break down structure

UNIT - III

Project Time Management: project schedules - Activity definition and sequencing - Activity resource and duration estimation- schedule development
Project Cost Management: Importance- Basic Principles-Cost Estimation- Budgeting and control

UNIT - IV

Project Quality Management: importance- Quality planning, Assurance and Control-Tools and Techniques for quality control- Quality Management
Project human resource Management: importance- managing people- resource planning acquiring the project team - developing the project team- managing the project team

UNIT -V

Project communication management: importance- communication planning- information distribution- performance Reporting- Managing Stakeholders
Project Risk Management: importance- Planning- Common Sources- Risk identification-Quality Risk analysis- response planning- Monitoring and control
Project procurement management- Planning purchases and acquisitions-contracting-seller responses

TEXT BOOKS:
1. Kathy Schwalbe, Project Management in IT, Cengage Learning, India Edition, 2009 (Chapters 1, 2, 4, 5, 6, 7, 8, 9, 10,11, 12)

REFERENCE BOOK
1. Gopal swamy Ramesh ,"Managing Global software projects" Tata McGraw Hill
2. S.A. Kelkar "Software project management – a concise study", Prentice – Hall of India P.Ltd, New Delhi, 2003.

08PCAZ12 SOFTWARE TESTING TECHNIQUES

4 Credits

UNIT- I

Building a Software Testing Strategy – Software Testing Design Techniques – Software Testing Tools and Selection of Test Automation Products – Software Testing Lifecycle and Software Testing Process

UNIT -II

Testing Effort Estimation and Test Planning – Software Test Effort Estimation Technique – Pre-Development Testing Requirements and Design Phase – Best Practices in Program Phase Unit, System and Integration Testing

UNIT -III

A Case Study on Acceptance Testing – Implementation an Effective Test Management Process – Building an Effective Test Organization – Performance Issues and Optimization Techniques

UNIT -IV

Choosing a Load Testing Strategy – Dodging the Bullets – Validating Mission-Critical Server Software for Reliability – Probing the Blind Spot – Testing in Today's Business and Usability

UNIT -V

Testing of Web-based Applications – Testing of Embedded Software System used in Aerospace Applications – Testing Application for Security – Testing Metrics, Best Practices and Benchmarks

TEXT BOOK
1. Software Testing Effective Methods, Tools and Techniques by Renu Rajani and Pradeep Oak Tata McGraw-Hill

ELECTIVE IV
08PCAZ13 NETWORK SECURITY AND CRYPTOGRAPHY
4 Credits

UNIT-I

Types of Physical Medium-Topologies-Wireless Networking: Wireless Protocols. Data Link Layer: Layered Data Link Protocols-SLIP and PPP-MAC and ARP. Network Layer: Routing Risks-Addressing-Fragmentation-Security.

UNIT-II

Internet Protocol: IP Addressing-ICMP-Security options. Transport Layer: Common Protocols-Transport Layer Functions-Gateways. TCP: Connection Oriented Protocols-TCP Connections-UDP. Session Layer: Session State Machine-Session and Stacks. SSL: SSL Functionality-Certificates. SSH: SSH and Security-SSH Protocols. STMP: Email Goals-Common servers. HTTP: HTTP Goals-URL.

UNIT-III

Security: Importance-Threat Models-Concepts-Common Mitigation Methods. Network theory: Standards Bodies-Network Stacks-Multiple Stacks-Layers and Protocols-Common Tools. Cryptography: Securing Information-Necessary Elements-Authentication and Keys-Cryptography and Randomness-Hashes-Ciphers-Encryption-Steganography.

UNIT-IV

Data Encryption Techniques-Data Encryption Standards-Symmetric ciphers. Public key Cryptosystems-Key Management.

UNIT-V

Authentication-Digital Signatures-E-Mail Security-Web Security-Intrusion-Firewall.

TEXT BOOKS:

1. Neal Krawetz, Introduction Network Security, India Edition, Thomson Delmar Learning. 2007
   (Unit-I:5.1,5.4,7.2,8.3,9,10,11.2,11.3,11.5,11.9,Unit-II:
   12.1,12.2,12.4,14.1,14.2,14.3,15.1,15.2,15.7,16.2,16.3,19.2,19.3,20.1,20.2,22.2,22
   23.1,23.2,Unit-III:1.1,1.2,1.3,1.4,3.1,3.2,3.3,3.4,3.5,4.1,4.2,4.3,4.4,4.5,4.6,4.7,4.8)

2. V.K.Pachghare, Cryptography and Information Security, PHI Learning Private Limited 2009, (Unit-IV: 2,3,5,7,8, Unit-V: 9,10,11,13,14,16)

REFERENCE BOOK:

1. William Stallings, Cryptography and Network Security, Prentice –Hall of India, 2008

08PCAZ14 DISTRIBUTED DATABASES

4 Credits

UNIT – I

Principles of Distributed Database – Levels of Distribution Transparency – Types of Data Segmentation – Distributed Database Access Primitives – Integrity constraints in Distributed Database – Distributed Database Design – Optimization of Access Strategies.

UNIT – II

The Management of Distributed Transactions – A Frame work of Transaction Management – Supporting Atomicity of Distributed Transaction – Concurrency control – Distributed Deadlocks –Optimistic Methods for Distributed Concurrency control – Reliability – Distributed Database Administration.

UNIT – III

Overview of Query Processing – Objectives of Query Processing – Complexity of Relational Algebra Operations – Characterization of Query Processors – Layer of Query Processing – Query Decomposition and Data Localization – Definition of Transaction – Properties of Transaction – Types of Transaction.

UNIT - IV

Parallel Database Systems – Parallel Architectures – Parallel DBMS Techniques – Parallel Execution Problem – Parallel Execution for Hieratical Architecture.

UNIT – V

Distributed Object Database Management Systems – Fundamental Object Concepts & Object Models – Object Distribution Design – Architectural issues – Object Query Processing – Transaction Management – Database Interoperability – Current issues.

TEXT BOOKS:

1. Stefano Ceri, Giuseppe Pelagatti, Distributed Databases Principles & Systems TATA-Mc-Graw Hill Edition 2008   [Unit-I: Chapter 3,4,6 Unit-II: Chapter 7,8,9,10]
2. M. Tamer Ozsu, Partiek Valourizz, S. Sridhar, Principles of Distributed Database , Pearson Education ,– 2007 (Unit-III: Chapter 7,8,10 Unit-IV: Chapter 13 Unit-V: Chapter 14,15,16)

08PCAZ15 DIGITAL IMAGE PROCESSING

4 Credits

UNIT - I
Introduction: What is Digital Image Processing? – Examples of Fields that Use Digital Image Processing – Fundamental Steps in Digital Image Processing – Components of an Image processing System – Digital Image Fundamentals: Elements of Visual Perception – Light and Electro Magnetic Spectrum – Image sensing and Acquisition – Image Sampling and Quantization – Some Basic Relationships between Pixels.

UNIT - II
The Image, its Mathematical Background: Overview – Linear Integral Transforms. Data Structures for Image Analysis: Level of Image Data Representation – Traditional Image Data Structures – Hierarchical Data structures. Image Pre-processing: Pixel Brightness Transformations - Geometric transformations – Local pre-processing: Image smoothing, Edge Detectors – Image Restoration.

UNIT - III
Segmentation : Thresholding – Edge Based Segmentation : Edge Image Thresholding, Border tracing - Region Based Segmentation – Matching – Shape Representation and **Description:** Region Identification – Contour Based Shape Representation and Description- Chain codes, Simple Geometric Border Representation - Region Based Shape Representation and Description, Simple Scalar Region Descriptors.

UNIT - IV
Object recognition: Knowledge Representation – Statistical Pattern Recognition – Neural Nets – Fuzzy Systems- Mathematical Morphology – Basic Morphological concepts – Binary Dilation and Erosion.

UNIT - V
Image Data Compression: Image Data Properties – Discrete Image Transforms in Image Data Compression – Predictive Compression Methods – Vector Quantization – Hierarchal and Progressive Compression Methods – Comparison of Compression Methods – Coding –JPEG Image Compression.

TEXT BOOKS
1. Rafael C. Gonzalez, Richard E.Woods, Digital Image Processing, Prentice Hall, Third Edition, 2008. (Unit-1: Chapter 1-1.1, 1.3, 1.4, 1.5, Chapter 2 -2.1, 2.2, 2.3, 2.4, 2.5).
2. Sonka, Hlavac, Boyle, Digital Image Processing and Computer Vision, Cengage Learning, 2009 (Unit -II: Chapter 3 – 3.1, 3.2 ,Chapter-4, Chapter-5,5.1, 5.2,5.3, 5.3.1, 5.3.2, 5.4 Unit-III: Chapter 6 -6.1, 6.2, 6.2.1, 6.2.3., 6.3, 6.4, Chapter 8 – 8.1, 8.2,8.2.1,8.2.2, 8.3, 8.3.1 Unit-IV- 4 – Chapter 9,9.1,9.2, 9.3,9.7, Chapter 13-13.1, 13.3 Unit-5: Chapter 14- 14.1, 14.2, 14.3, 14.4, 14.5,14.6, 14.8, 14.9,14.9.1)

REFERENCE BOOKS
1. Anil.K.Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1989.
2. Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall ,3rd Edition

08PCAZ16 WIRELESS APPLICATION PROTOCOL

4 Credits

UNIT -I

Overview of WAP-WAP and the wireless world-WAP application architecture-WAP Internal Structure-Setting up WAP - Available software products-Development toolkit.

UNIT -II

What a WAP Gateway-Functionality of a WAP Gateway-the Web model vs the WAP model –positioning of a WAP Gateway.

UNIT- III

Basic WML-Text formatting-Navigating-Advanced display features-Interacting with user-WML script-variables & Literals, Operators, Control constructs, Functions-Using standard Libraries.

UNIT- IV

Multiple device types using XML and XSLT- Using XML to define data- Transforming XML into other formats - XSLT.

UNIT -V

Interacting with the Mobile Phone - fundamentals of the WTA Architecture-WTA Interfaces-WTA state model-WTA Applications Scenarios-Voice XML-Voice Markup Language.

TEXT BOOK:
1. Professional WAP, Charles Archart, Nirmal Chidambaram & co,Wrox press Ltd, Fourth Edition,2002
   (Chapters: 1,2,3,4,5,6,9,10,17,18)

REFERENCE BOOKS
1. Dharma Prakash Agrawal, Qing An Zeng, "Introduction to Wireless and Mobile systems ,Cengage Learning, New Delhi -2008.
2. William Stallings, Wireless Communication and Networks, Pearson Education, 2003.
3. Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.
4. David Hunter & co.,Beginning XML ,Third Edition –Wrox Phublishers-2006