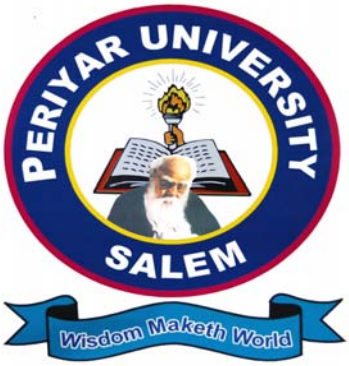
PERIYAR UNIVERSITY
PERIYAR PALKALAI NAGAR
SALEM – 636 011



DEGREE OF MASTER OF SCIENCE

CHOICE BASED CREDIT SYSTEM

SYLLABUS FOR MASTER OF COMPUTER APPLICATION

FOR THE STUDENTS ADMITTED FROM THE ACADEMIC YEAR 2012 – 2013 ONWARDS

Regulations

Effective from the academic year 2012 - 2013

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 2012 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-12PCA01-Computer Architecture And Microprocessors	4	4	3	25	75	100
Core Course-II-12PCA02-Data Structures	4	4	3	25	75	100
Core Course-III-12PCA03-Theory of Programming Languages and C	4	4	3	25	75	100
Core Course-IV-12PCA04-Discrete Structures and Automata Theory	4	4	3	25	75	100
Core Course-V-12PCA05-E-Technologies	4	4	3	25	75	100
Core Course-VI - 12PCAP01-Lab – I - C and Data Structures Lab	2	5	3	40	60	100
Core Course-VII- 12PCAP02-Lab - II Multimedia Lab	2	5	3	40	60	100
Semester-II						
Core Course-VIII-12PCA06-Object Oriented Programming	4	4	3	25	75	100
Core Course-IX - 12PCA07-Managerial Accounting	4	4	3	25	75	100
Core Course-X-12PCA08-Data Base Management Systems	4	4	3	25	75	100
Core Course-XI-12PCA09-Operating Systems	4	4	3	25	75	100

EDC –I	4	4	3	25	75	100
Core Course-XII-12PCAP03-Lab – III Object oriented Programming Lab	2	5	3	40	60	100
Core Course-XIII-12PCAP04-Lab – IV Operating System Lab	2	5	3	40	60	100
Semester-III						
Core Course-XIV-12PCA10 Visual Programming	4	4	3	25	75	100
Core Course-XV-12PCA11 Design and Analysis of Algorithms	4	4	3	25	75	100
Core Course-XVI-12PCA12 Software Engineering and Testing	4	4	3	25	75	100
Core Course-XVII-12PCA13 Optimization Techniques	4	4	3	25	75	100
Elective Course-I-12PCAZ_	4	4	3	25	75	100
Core Course-XVIII-12PCAP05 Lab- V Visual Programming Lab	2	5	3	40	60	100
Core Course-XIX–12PCAP06 - Lab-VI Software Testing Lab	2	5	3	40	60	100
Semester-IV						
Core Course-XX-12PCA14 Computer Graphics	4	4	3	25	75	100
Core Course-XXI-12PCA15 Computer Networks	4	4	3	25	75	100
Core Course-XXII-12PCA16 Advanced Java Programming	4	4	3	25	75	100
Core Course-XXIII-12PCA17 Data mining and Warehousing	4	4	3	25	75	100
Elective Course-II- 12PCAZ_	4	4	3	25	75	100
Core Course-XXIV-12PCAP07 Lab-VII – Advanced Java Programming Lab	3	5	3	40	60	100

Core Course-XXV – 12 PCAPR1 Mini Project – Viva Voce	3	3	3	40	60	100
Human Rights	-	2	3	-	-	100
Semester-V						
Core Course-XXVI-12PCA18 Soft Computing	4	4	3	25	75	100
Core Course-XXVII-12PCA19 .Net Programming	4	4	3	25	75	100
Core Course-XXVIII-12PCA20 Web Technologies	4	4	3	25	75	100
Elective Course-III-12PCAZ_	4	4	3	25	75	100
Elective Course-IV-12PCAZ_	4	4	3	25	75	100
Core Course-XXIX-12PCAP08-LAB-VIII .Net Programming Lab	3	5	3	40	60	100
Core Course-XXX-12PCAP09-LAB-IX Web Programming Lab	3	5	3	40	60	100
Semester-VI						
Core Course-XXXI-12PCAPR2 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 12 PCAZ01	**Compiler Design**
Course 12 PCAZ02	**Object Oriented Analysis and Design**
Course 12 PCAZ03	**Parallel Processing**
Course 12 PCAZ04	**Management Concepts and Communication**

Elective Course -II

Course 12 PCAZ05	**Artificial Intelligence**
Course 12 PCAZ06	**Mobile Computing**
Course 12 PCAZ07	**Client/server Technology**
Course 12 PCAZ08	**Principles of Programming Languages**

Elective Course -III

Course 12 PCAZ09	**Embedded Systems**
Course 12 PCAZ10	**Emerging Trends in Computing**
Course 12 PCAZ11	**Software Project Management**
Course 12 PCAZ12	**Bioinformatics**

Elective Course -IV

Course 12 PCAZ13	**Network Security and Cryptography**
Course 12 PCAZ14	**Enterprise Resource Planning**
Course 12 PCAZ15	**Digital Image Processing**
Course 12 PCAZ16	**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

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

Students shoud write about their project work briefly.

i) Aim
ii) Features of mini project
iii) Modules of Project work

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.

8. 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.**

9. 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 2012-13, i.e. for students who are admitted to the first year of the course during the academic year 2012-13 and thereafter.

11. TRANSITORY PROVISION:

Candidates who were admitted to the PG course of study before 2012-2013 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 2013. 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

1.1 ORGANIZATION PROFILE

1.2 SYSTEM SPECIFICATION

1.2.1 HARDWARE CONFIGURATION

1.2.2 SOFTWARE SPECIFICATION

2. SYSTEM STUDY

2.1 EXISTING SYSTEM

2.1.1 DRAWBACKS

2.2 PROPOSED SYSTEM

2.2.1 FEATURES

3. SYSTEM DESIGN AND DEVELOPMENT

3.1 FILE DESIGN

3.2 INPUT DESIGN

3.3 OUTPUT DESIGN

3.4 DATABASE DESIGN

3.5 SYSTEM DEVELOPMENT

3.5.1 DESCRIPTION OF MODULES

(Detailed explanation about the project work)

4. TESTING AND IMPLEMENTATION

5. CONCLUSION

BIBLIOGRAPHY

APPENDICES

A. DATA FLOW DIAGRAM

B. TABLE STRUCTURE

C. SAMPLE CODING

D. SAMPLE INPUT

E. SAMPLE OUTPUT

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
12PCA01 COMPUTER ARCHITECTURE AND MICROPROCESSOR

4 Credits

UNIT – I

Data representation: Data types – Complements - Other binary codes – Error detection code - Digital logic circuit: Logic gates - Boolean algebra - Maps simplification – Combinational Circuits – Flip Flops – Sequential Circuits.

UNIT - II

Digital Components: Integrated Circuits – Decoders – Multiplexers - Registers - Shift Registers – Binary Counters – Memory unit. Register Transfer and Micro Operation: Register Transfer – Bus and Memory transfer – Arithmetic Micro Operations – Logic Micro Operations – Shift Micro Operations – Arithmetic logic shift unit.

UNIT – III

Micro programmed Control: Control Memory – Address Sequencing. CPU: General Register Organization – Stack Organization – Instruction Format – Addressing Modes – Data transfer and Manipulation – Program Control.

UNIT - IV

Evolution of Microprocessor - Typical Computer Architecture – Single Chip Microprocessor – Intel 8085: Introduction – Register structure – Memory Addressing - 8085 Addressing Modes – 8085 Instruction set – Timing methods – 8085 CPU pins and

associated signals – 8085 Timing and execution – Programmed I/O – Interrupt systems - DMA – SID and SOD lines – 8085 Based system design.

UNIT – V

Intel 8086 Architecture - Addressing modes – Peripheral Interfacing: Parallel versus Serial transmission – Synchronous and Asynchronous Serial data transmission – Interfacing of Hexadecimal keyboard and Display unit to a Microprocessor –CRT terminal interfacing to a microprocessor –DMA controllers - Interface standards: parallel interface - Serial Interface.

TEXT BOOKS

1. Morris Mano, Computer System Architecture , Third Edition, PHI,1995. (Unit I, II, and III)
2. M.Rafiquzzaman, Microprocessors Theory and Applications : Intel and Motorola , Prentice Hall India, Revised Edition, 2004. (Unit IV and 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.

12PCA02 DATA STRUCTURES

4 Credits

UNIT - I

Introduction: Definitions – Concept of Data Structures – Overview of Data Structures – Implementation. Arrays: Definition – Terminology – One dimensional array – Multidimensional 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 Tremplay and Paul G.Sorenson, An Introduction to Data Structures with Applications ,TMH, 1995.
2. Horowitz.E., Sahni and Anderson Freed, Fundamentals of Data Structures in C , Universities Press, Second Edition..

12PCA03 THEORY OF PROGRAMMING LANGUAGES AND C

4 Credits

UNIT – I

Planning the Computer Program – Computer languages – Programming in computer languages- The technique of Flow Charting – Hierarchy of Programming Languages – An Overview of C – Keywords and Identifiers - Constants – Variables -Data Types.

UNIT – II

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. M.T.Somashekara, Programming in C , PHI, 2005.
2. Arpita Gopal, Magnifying C , PHI, 2009.

REFERENCE BOOKS

1. Ashok N.Kamthane, Programming with ANSI and Turbo C , Pearson

Education Asia, 2003.
2. Yeswanth Kanetkar , Let us C , BPB publications, 2001
3. Yeswanth Kanetkar , Pointers in C , BPB publications

12PCA04 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.

12PCA05 E-TECHNOLOGIES

4 Credits

UNIT - I

E-Commerce : In the Beginning : what Is E-Commerce ? – Advantages and Limitations of E-Commerce – The Role of Strategy in E-Commerce – Value chains in E-Commerce – Integrating E-Commerce – Managerial Implications - The Internet and the WWW : The Internet today – Unique benefits of the internet - Searching online – BBS and Pay services – The Language of the Internet .

UNIT - II

Launching a Business on the Internet : The life cycle approach – The business planning and strategizing Phase – Hardware, software, Security and the setup phase – Design phase – The marketing phase – The fulfillment phase – The maintenance and enhancement phase. Designing Web sites : The life cycle of site building – Building a web site – Web navigation design - Design criteria – Hiring a web designer - Website evolution and usability testing : Anatomy of a site – Cookies – What makes a website useful – Website content and Traffic management.

UNIT - III

Payment systems : From barter to money – Requirements for the internet based payment – Electronic payment media – Issues and implications – E-security : Security in cyberspace – Designing for security – Kinds of threats(risk) – Virus – Security protection and recovery - Securing your system.

UNIT - IV

Marketing on the internet : the pros and cons of online shopping – internet marketing techniques – The E-cycle of internet marketing – Marketing your Presence – Attracting Customers – Tracking Customer – Customer service - Web based business to business Ecommerce : B2B Ecommerce – B2B Models – B2B tools –EDI.

UNIT - V

Internets and Extranets : The Basics – The technical infrastructure – Planning an intranet – E-mail and the Intranet – Extranets. Legal and ethical issues.

TEXT BOOK ;

1. Elias M. Awad, Electronic Commerce, Prentice-Hall of India, 2008

REFERENCE BOOKS:

1. Gary P. Schneider, E-Commerce Strategy, Technology and Implementation, CENGAGE Learning INDIA Private Limited,. Reprint 2008
2. P.T. JOSEPH, E-Commerce an Indian Perspective , Third Edition, Prentice Hall of India.
3. Mike Papazologn, E-Business, Organizational and Technical Foundations , Wiley India Pvt Ltd, 2008
4. Kenneth C.Laudon, Carlo Guercio Traver, E- Commerce-business, technology, society , Pearson Education 2009.

12PCAP01 C AND DATA STRUCTURES LAB

2 Credits

Develop Programs to implement the following:

1. Perform various Operations on Single Dimensional Arrays. (SUM, AVERAGE)
2. Perform various Operations on Matrices. (ADDITION, SUBTRACTION & MULTIPLICATION)
3. Perform String Operations using String Library Functions
4. Functions and recursive functions
5. Structures
6. Array of structures
7. Sorting a set of numbers using
    i) Bubble sort
    ii) Merge sort
8. Search and print the position of the number using
    a. Linear search technique
    b. Binary search technique
9. Perform addition of Sparse Matrices
10. Perform Polynomial Addition and Multiplication
11. Perform various operations on Stacks
12. Perform various operations on Queues
13. Perform various operations on Linked Lists
14. Perform various operations on Doubly Linked Lists

12PCAP02 MULTIMEDIA LAB

2 Credits

Using C

1. Displaying a BMP file using C.
2. Device a routine to produce the animation effect of a square transforming to a triangle and then to a circle.
3. Simple Animation.

Using Flash

1. Animation (tweened, motion)
2. Adding Actionscripts
3. Design an advertisement.

Using Director

1. Create a Movie
2. Text Handling
3. Animation of an Object with Sound.
4. Play School teaching Aid

Using Adobe Photoshop

1. Drawing Pictures
2. Editing images
3. Applying various filtering tools
4. Displaying Text in different Effects
5. Lighting
6. Morphing.

SEMESTER II

12PCA06 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.

12PCA07 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.

12PCA08 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

Structured Query Language – Data definition commands – Basic data management – Queries – Advanced Data management commands – Complex queries and SQL functions – Procedural SQL.

UNIT – IV

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 –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 - 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.

TEXT BOOKS:

1. Peter Rob Carlos Coronel, Database Systems – Design, Implementation and Management , Thomson Course Technology, Fifth Edition – 2002.

REFERENCE BOOKS:

1.Abraham Silberschatz, Henry F.Korth, S.Sudarshan, Database System Concepts , McGraw-Hill, Fourth Edition-2002.

2. Raghu Ramakrishnan and Johannes gehrke, Database Mangement System , Mc Graw Hill, 2000.

3. Gerald V.Post, Database Management Systems –Designing & Building Business Applications , Mc Graw Hill, 2000.

4.C.J.Date, An Introduction to Database Systems , 7th Edition, Pearson.

12PCA09 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: Swapping- contiguous- paging – segmentation-segmented paging - Virtual Memory – demand paging - Page Replacement Methods-Thrashing

UNIT-V

I/O AND FILE SYSTEMS: File System Interface: File Concepts- Access Methods-Directory Structure-Protection- I/O system: Disk Scheduling – File System Implementation – Directory Implementation - Allocation Methods-Free Space Management-Case Study: Linux System: design principles, Process management, Scheduling.

TEXT BOOK

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

REFERENCE BOOKS

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

12PCAP03 OBJECT ORIENTED PROGRAMMING LAB

2 Credits

Implement the following using C++:

1. Classes & Objects.
2. Function Overloading

3. Friend function
4. Operator overloading
5. Inheritance
6. Virtual Function
7. Templates

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.

12PCAP04 OPERATING SYSTEM 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 scheduling. 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 scheduling. Compute and print the average waiting time and average turnaround time.
5. Implement Least Recently Used page replacement Algorithm.
6. Implement FIFO page replacement Algorithm.
7. Simulate sequential file allocation strategies
8. Simulate Bankers Algorithm for Dead Lock Avoidance

SEMESTER III
12PCA10 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

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.1,3,4,6,7,9,11)
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. John Mueller, 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.

12PCA11 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: Least Cost Search. Bounding: FIFO Branch and Bound and LC Branch and Bound. 0/1 Knapsack Problem, Travelling Salesman Problem.

TEXT BOOK:

1. E.Horowitz, S.Sahni and Sanguthevar rajasekaran , Fundamentals of Computer Algorithms , Second edition, Universities Press.

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.

12PCA12-SOFTWARE ENGINEERING AND TESTING

4 Credits

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 - While Box testing - Black Box Testing – Integration testing: Type of testing – Phase of testing – Scenario Testing.

UNIT - V

System and Acceptance Testing: System Testing Overview - Need of System Testing – Functional versus Non-functional Testing – Functional System Testing – Non-functional Testing – Acceptance Testing – Performance Testing – Regression testing.

TEXT BOOKS:

1. Roger Pressman.S., Software Engineering: A Practitioner's Approach , 6th Edition, Mcgraw Hill, 2005. (UNIT I, II & III).
2. Srinivasan Desikan and Gopalasway Ramesh, Software Testing Principles and Practices , Pearson's Education, 2006.

REFERENCE BOOKS:

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.
4. Rajib Mall, Fundamentals of Software Engineering , PHI, 2010.

12PCA13 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

12PCAP05 VISUAL PROGRAMMING LAB

2 Credits

VISUAL BASIC

Create tables in Oracle/Access. Prepare appropriate reports using the queries. Each database application should contain atleast two reports based on complex queries.

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.

12PCAP06 SOFTWARE TESTING LAB

2 Credits

Tools : Win Runner, Silk Test, Load Runner, Test Director, Rational Rose, JMeter & QTP etc.

Perform various types of testing like whitebox testing, Blackbox testing , Regression testing, Performance testing.

1. Write a program in C/C++ to find the roots of a quadratic equation and perform the following on it: Boundary Value Analysis (BVA).
2. Write a program in C/C++ to find the area of a circle, triangle, square and rectangle and perform the following: Equivalence Class testing.
3. Write a program in C/C++ to compute a raise to b and perform the following: decision table based testing.
4. Write a program in C/C++ to read 3 sides of a triangle and to determine whether they form scalene, isosceles or equilateral triangle and test the same using cause Effect Graphing testing technique.
5. Write a program in C/C++ to compute total salary of an employee given his/her basic salary. The slab is given below:

   HRA = 30% of basic

DA = 80% of basic

MA = Rs. 100/-

TA = Rs. 800/-

I. Tax = Rs. 700/-

Pf = Rs. 780/-

Draw its path graph and find its V(G) by all the 3 methods.

6. Write a program in C/C++ to read the marks of 10 students in 5 subjects. Find their averages and allot them the grades. Now draw its Graph Matrix and find its V(G).
7. Design a login screen to test GUI.
8. Design students mark analyzing.

SEMESTER IV

12PCA14 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 BOOKS:

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 BOOKS:

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.

12PCA15 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 BOOKS:

1. William Stallings, Data and Computer Communication , **5th edition**, PHI.

2. Behrouz A. Forouzan, Data Communications and Networking , **3rd edition** Tata McGraw-hill.

12PCA16 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. 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.

12PCA17 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 BOOKS:

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.

12PCAP07 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.

12PCA18 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

12PCA19 .NET PROGRAMMING

4 Credits

UNIT – I

Microsoft .NET Framework - . The .NET Framework classes –Common Language Runtime – Common Type system and Common Language specification – Visual studio .NET IDE. Visual Basic .NET – Visual Basic .NET IDE –Variables – Data types – Constants – Arrays – Dynamic arrays- Controlling the flow – if statement – select case – Loops.

UNIT – II

Procedures: modular coding, arguments – Structures- Collections: Advanced array, Arraylist and hash table. Lists- sorted list. Creating custom class, adding methods and properties. Building Windows Applications – working with forms.

UNIT – III

Basic windows controls- common dialog controls- Rich text box control- Debugging and Error Handling: types of errors, Exceptions and structured exception handling – Accessing databases – Building Database applications with ADO .Net- ADO .Net objects.

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. Evangelos Petroutsos, Mastering Visual Basic .NET ,BPB Publications.
2. Barbara Doyle, Programming in C#, Cengage Learning publications –I Edition – 2008
3. Kathleen Kalata , Web Applications using ASP .NET 2.0 - Cengage Learning publications.

REFERENCE BOOKS

1. David Chappell, Understanding .NET , Pearson education, 2002
2. David.S.Platt, Introducing Microsoft .Net , PHI, 2003.
3. G.Andrw Duthie , Microsoft ASP .NET Programming with Microsoft Visual C# .NET step by step , PHI ,2003.
4. George Shepherd, Microsoft ASP .NET 3.5 , PHI, New Delhi, 2008.
5. Steven Holzner, Visual Basic .NET Programming Black Book , Dreamtech Press.

12PCA20 WEB TECHNOLOGIES

4 Credits

UNIT - I

HTML: introduction - Common tags: List, Tables, images, forms, Frames; Cascading Style sheets.

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 Parsers: DOM and SAX.

UNIT - III

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

UNIT - IV

Objects in java script- built in objects- 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. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech. (Unit I & II)
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. Ed Wilson, Microsoft VB Script Step by Step , PHI, New Delhi, 2008.

12PCAP09 .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 to 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.

12PCAP10 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 Java Script Program, embedded in an HTML web page, to play a simple game.

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

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

ELECTIVE I

12PCAZ01 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 ,.

12PCAZ02 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: Introduction- Frameworks, Pattern catalogs and pattern languages – The types of patterns: The singleton pattern – Singleton pattern template – The factory pattern – The builder pattern – The prototype pattern. Structural– Types: The Adapter pattern – The Bridge pattern – The decorator pattern – The façade pattern – The flyweight pattern – The proxy pattern – The composite pattern. Behavioural Patterns: The strategy pattern – The state pattern – The observer pattern – The Mediator pattern – The visitor pattern- The chain of responsibility pattern – Interpreter pattern.

UNIT – V

Object Oriented Programming Languages - Case Studies: student Loan System – Credit Card Management System.

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.

12PCAZ03 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.

12PCAZ04 MANAGEMENT CONCEPTS AND COMMUNICATION

4 Credits

It should be handled and valued by Commerce /MBA Department

UNIT – I

Management: Meaning and definition – Features – Functions – Importance – Difference between Administration and Management - management Hierarchy. Planning: Meaning – Nature – Objectives – Importance – Steps in planning - Advantages and limitations – Management by objectives.

UNIT - II

Organization : meaning-Functions – Principles – Types of organization – Merits and Demerits. Staffing: Definition – Processing of staffing – Recruitment – Sources of recruitment – Stages in selection procedure – Trading and development.

UNIT - III

Motivation : Meaning and Importance - Types – Theories of Motivation – Maslow – McGregor , Herzberg. Leadership – Need and importance – Qualities of leadership - Leadership styles.

UNIT - IV

Controlling: Definition-Steps in control process-Requirements of effective control systems. Advantages and limitations – Budgetary and non budgetary control techniques. Communication: Meaning and importance – Process of communication – Principles – Types – Barriers to communication – Overcoming barriers.

UNIT - V

Written communication – Business letters –Layouts of business letter – Drafting letters for sales and collection, Oral communication – Interviews –Telephone conversation – Instruction –Dictation. Conducting meetings: Notice, Agenda, Minutes.

TEXT BOOKS:

1. L.M. Prasad, Principles and Practice of Management , Sultan Chand and sons.
2. Rajendran paul and Korala kalli, Essentials of business communication , Sultan Chand and sons

REFERENCE BOOKS:

1. Tripathy and Reddy, Principles of Management , TMH.
2. Koontz and Werich, Essentials of Management .

ELECTIVE II
12PCAZ05 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- Heuristic 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 Rule Involving Quantifiers - Forward and Backward Chaining - Completeness - Resolution - 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.

12PCAZ06 MOBILE 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

12PCAZ07 CLIENT/SERVER TECHNOLOGY

4 Credits

UNIT-I

Basic concepts of Client/Server – Characteristics – File Servers – Database servers – Transaction servers- Groupware servers – Objective servers – Web servers – Fat servers or fat clients – 2 tier versus 3 tier – Client/Server building blocks – Operating system services. Base services – Extended services – Server scalability – Client Anatomy.

UNIT-II

NOS Middleware – Peer-to-peer communications – RPC – MOM Middleware – MOM versus RPC - The fundamentals of SQL and relational databases – Server architecture – Stored procedures, triggers and rules.

UNIT-III

Online transaction processing – Decision support systems – OLTP versus DSS: programming effort, database needs – Data warehouses – Elements - Hierarchies – Replication versus Direct access – Replication mechanism – EIS/DSS Tools – Client/server transaction processing – transaction models – TP Monitors – Transaction management standards.

UNIT-IV

Groupware – Components – Distributed objects and components – CORBA: components – Object Management Architecture – Services – Business objects.

UNIT-V

Client/server Distributed system management – components – Management application – The Internet Management Protocols – OSI Management Framework – The Desktop Management Interface – X/Open Management Standards – Client/server application development tools – Client/Server Application Design.

TEXT BOOK:

1. Robert Orfali, Dan Harkey and Jeri Edwards, The Essential Client Server Survival Guide, 2nd edn. Galgotia

REFERENCE BOOKS:

1. Dawna Travis Dewire, Client/Server computing, Tata McGraw Hill.
2. Jafferey D. Schank, Novell's guide to Client/Server Application and Architecture, BPB Publications.

12PCAZ08 PRINCIPLES OF PROGRAMMING LANGUAGES

4 Credits

UNIT - I

Language Design Issues: History-Role of Programming languages - environments - Impact of machine Architectures - Language Translation Issues: Programming language Syntax- Stages in Translation - Formal Translation models - Recursive descent Parsing.

UNIT - II

Modeling Language Properties: 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 BOOK:

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

ELECTIVE III

12PCAZ09 EMBEDDED SYSTEMS

4 Credits

UNIT – I

Introduction: Telegraph – Cordless bar code scanner – Underground tank monitor – Hardware fundamentals: Gates – Timing diagrams - Memory – Advanced hardware fundamentals : Microprocessors – Microprocessor Architecture – Direct Memory Access- Interrupts.

UNIT – II

Interrupts: Interrupt Basics – Interrupt Service Routines. The Shared Data Problems – Survey of Software Architectures: Round Robin with Interrupts - Function – Queue – Scheduling Architecture – Real Time Operating System.

UNIT – III

Introduction To Real Time Operating System– Tasks And Task States – Task And Data - Semaphores And Shared Data. More Operating Systems Services : Queues, Mail Boxes And Pipes – Timer Functions – Events – Memory Management – Interrupt Routines In An RTOS Environment.

UNIT – IV

Basic Design Using Real Time Operating Systems : Principles – Examples – Encapsulating Semaphores And Queues - Hard Real Time Scheduling Considerations – Saving Memory Space And Power.

UNIT – V

Embedded Software Development Tools: Host And Target Machines – Linker/Locators For Embedded Software – Getting Embedded Software Into The Target Systems. Debugging Techniques: Testing On Your Host Machine-Instruction Set Simulators – The Assert Macro – Using Laboratory Tools.

TEXT BOOK:

1. David E.Simon. An embedded software primer , Addisons Wesley – 2001.

REFERENCE BOOKS:

1. Raj Kamal, Embedded Systems – Architecture, Programming and Design , Tata McGraw-Hill,2003.
2. Steve Heath, Embedded Systems Design , Elsevier, 2003.
3. Frank Vahid and Tony Givargis, Embedded System Design , John Wiley and Sons, Inc, 2002.

12PCAZ10 EMERGING TRENDS IN COMPUTING

4 Credits

UNIT – I

Grid Computing: Introduction – Technologies and Architectures for Grid Computing – Web Services and Service oriented Architecture - OGSA and WSRF – The Grid and the Databases.

UNIT - II

Cluster Computing: What is Cluster Computing – Cluster Middleware: Introduction – Networking, Protocols & I/O for Clusters: Networks and Interconnection/switching devices - Design Issues in Interconnection Networking /Switching – Design Architecture – General Principles and Tradeoffs. Setting up and administering a Cluster – Cluster technology for High availability – Performance Models and Simulation – Process Scheduling – Load Sharing and Load Balancing.

UNIT - III

Cloud Computing – History To Cloud Computing – Cloud Architecture – Cloud Storage – Why Cloud Computing Matters – Advantages of Cloud Computing – Disadvantages of Cloud Computing – Cloud Services.

UNIT - IV

Web Based Application Pros And Cons Of Cloud Service Development – Types Of Cloud Service Development – Software As A Service – Platform As A Service – Web Services – On Demand Computing – Discovering Cloud Services Development Services And Tools – Amazan Ec2 – Google App Engine – IBM Clouds.

UNIT- V

Centralizing Email Communications – Collaborating on Schedules – Collaborating On to-do Lists – Collaborating Contact Lists – Cloud Computing Further Community – Collaborating on Group Projects and Events.

TEXT BOOKS:

1. C.S.R.Prabhu, Grid and Cluster Computing ,PHI,2012.(UNIT I & II)
2. Michael Miller, Cloud Computing: Web based applications that change the way you work and collaborate online , Que publishing, Aug 2008. (UNIT III, IV & V)

REFERENCE BOOKS:

1. George Reese, Cloud application architectures: Building applications and infrastructure in the cloud , Orelly's, First Edition, Apr 2009.
2. Fran Berman, Geoffrey Fox, J.G.Anthony Hey, Grid Computing: Making the global infrastructure a reality , John Wiley and Sons, 2003.
3. Joshy Joseph and Craig Fellensten, Grid Computing , Pearson Education, 2004.

12PCAZ11 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 BOOK:

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 BOOKS:

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.

12PCAZ12 BIOINFORMATICS

4 Credits

UNIT -I

Bioinformatics: An overview – Introduction – Objectives of bioinformatics – What kind of data is used multiplicity of data and data mining – Major Bioinformatics databases – Data integration – Data analysis – Careers in bioinformatics. History of Bioinformatics: The history of Bioinformatics - Major event in Biology - Major events in development of Biological techniques - Major developments in computational technologies and Bioinformatics.

UNIT-II

Proteins: Their structure profiles and properties: Introduction – Aminoacids – protein structure – secondary structure elements – Tertiary structure – Quaternary structure – Protein folding – protein function – Proteins – Purification and Characterisation.

Tools for sequence Alignment: Introduction – Faster – Blast – Filtering and gapped blast – PSI blast – Comparison of running time for various programs.

UNIT-III

Understanding and using Biological Databases: Introduction – Overview of RNA secondary structure – Overview of RNA tertiary structure – Gene prediction tools using the Linux Operating System: Introduction to Linux – The basics of Linux System – Using Linux file system and directories – Text processing – Writing Shell programs.

UNIT-IV

Relational Databases for Biological Information: Introduction – Types of databases; Object oriented Databases: Introduction – Object Oriented databases – Introduction to the Java clients – Common Object Request Broker Architecture (CORBA).

UNIT-V

Managing Biological Databanks: Introduction – Submission of data – Creation of databases – Establishing databases on networks – Integration of databases – Mining of databases – Management of workflow. Biological concepts for Bioinformatics: The DNA – Internet Basics – Biological Databases.

TEXT BOOKS:

1. S.C. Rastogi, Namita Mendiratta, Parag Rastogi, Bioinformatics – Concepts, Skills and Applications , CBS Publishers and Distributors, New Delhi, Bangalore (India), Second Edition. (Chapters: 1,4,5,7,8,9,11)
2. Dr.K. Mani, N. Vijayaraj, Bioinformatics for Beginners , General Editor: Dr. D. Padmanaban, Kalaikathir Achchagam, Coimbatore. (Chapter 1.1, 1.2 ,2.1, 2.4)

REFERENCE BOOKS:

1. S.C. Rastodi, N. Mendiratta, P. Rastogi, Bioinformatics Methods and Applications – Genomics, Proteomics and Drug Discovery , Second Edition, Prentice Hall of India Private Limited, New Delhi.
2. Puneet Mehrotra, Dr. Keemud Sarin, Swapna, K. Srivastava, The New Handbook of Bioinformatics , Vikas publishing House Pvt Ltd.
3. M.M. Ranga, Bioinformatics Agrobios India, First Print – 2003.
4. Jin Xiong, Essential Bioinformatics , Cambridge University Press.

ELECTIVE IV
12PCAZ13 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

12PCAZ14 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 BOOKS:

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 BOOKS:

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

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

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

12PCAZ16 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.
1. Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.
2. David Hunter & co.,Beginning XML ,Third Edition –Wrox Phublishers-2006