PERIYAR   UNIVERSITY
SALEM – 636 011

MASTER OF COMPUTER APPLICATIONS (M.C.A)
(Under Choice Based Credit System)

REGULATIONS AND SYLLABUS

(for University Department)
(For the candidates admitted from the academic year 2011-2012 onwards)

1. **OBJECTIVE OF THE PROGRAMME**

The objective of the MCA programme is to impart world class education for productive careers in software industry and academia.

ELIGIBILITY FOR ADMISSION TO THREE YEAR M.C.A. PROGRAMME:

Candidates who have passed in any one of the following or equivalent are eligible to apply:

(i)   Bachelor's Degree (under 10+2+3/4) in any subject with Mathematics at +2 level

OR

(ii)   Bachelor's Degree (under 10+2+3/4) in any subject with Mathematics/Statistics as one of the subjects.

2. **DURATION OF THE PROGRAMME AND MEDIUM**

The programme shall be of three years duration spread over six semesters under choice based credit system. The Maximum duration to complete the course shall be two academic years after normal completion of the programme. The medium of instruction/study is English.

3. **DISTRIBUTION OF CREDITS**

The **minimum** credit requirement for full time three year Master of Computer Applications programme shall be 142 credits. The break-up of credits is as follows:

Core Courses: 106

Elective Courses: 24

Non - Major Elective Courses: 12

4. **COURSE OF STUDY**

The course of study for the degree Master of Computer Applications shall be with internal assessment according to the syllabus prescribed from time to time.

Total Marks   :   4300

For each theory course   :   100 Marks (I.A: 25 + ESE:75)

For each practical course   :   100 Marks (I.A: 40 + ESE:60)

Industrial training   :   100 Marks (IA: 40 + ESE:60)

(Joint viva-voice by internal and external examiners)

Dissertation and Viva-voce   :   200 Marks

(I.A: 50 + Evaluation of the report by external 50 +Joint viva by internal& external examiners 100)

5. PROGRAMME STRUCTURE / SCHEME OF EXAMINATIONS

Course	Number of Credits	Hours Per Week	Examination Duration (hrs)	Marks		
				I. A	ESE	Total
Semester-I						
Course-11UPCSC1C01 Digital Principles and Computer Organization	4	4	3	25	75	100
Course-11UPCSC1C02 Object Oriented Programming in C++	4	4	3	25	75	100
Course-11UPCSC1C03 Data Structures	4	4	3	25	75	100
Course-11UPCSC1C04 Mathematical foundations for Computer Science	4	4	3	25	75	100
Course-11UPCSC1C05 Problem Solving Techniques	4	4	3	25	75	100
Course-11UPCSC1C06 Object Oriented programming with C++-**Lab**	2	4	3	40	60	100
Course-11UPCSC1C07 Data structures –**Lab**	2	4	3	40	60	100
Course-11UPCSC1C08 Office Automation–**Lab**	1	2	3	40	60	100
Semester-II						
Course-11UPCSC1C09 Relational Data Base Management Systems	4	4	3	25	75	100
Course-11UPCSC1C10 Microprocessors	4	4	3	25	75	100
Course-11UPCSC1C11 System Analysis and Design	4	4	3	25	75	100
Course-11UPCSC1C12 Front end Tools	4	4	3	25	75	100
Non – Major Elective - I	4	4	3	25	75	100
Course-11UPCSC1C13 Assembly Language Programming –**Lab**	2	4	3	40	60	100
Course-11UPCSC1C14 RDBMS–**Lab**	2	4	3	40	60	100
Course-11UPCSC1C15 Financial Computing –**Lab**	1	2	3	40	60	100

Semester-III						
Course-11UPCSC1C16 Operating Systems	4	4	3	25	75	100
Course-11UPCSC1C17 Web Technology	4	4	3	25	75	100
Course-11UPCSC1C18 Visual C++ Programming	4	4	3	25	75	100
Elective Course-I	4	4	3	25	75	100
Non Major Elective - II	4	4	3	25	75	100
Course-11UPCSC1C19 Visual Programming–**Lab**	2	4	3	40	60	100
Course–11UPCSC1C20 Operating systems – **Lab**	2	4	3	40	60	100
Course-11UPCSC1C21 Web Technology–**Lab**	1	2	3	40	60	100
Semester-IV						
Course-11UPCSC1C22 Computer Networks	4	4	3	25	75	100
Course-11UPCSC1C23 Programming in Java	4	4	3	25	75	100
Elective Course – II	4	4	3	25	75	100
Elective Course – III	4	4	3	25	75	100
Non Major Elective - III	4	4	3	25	75	100
Course-11UPCSC1C24 Animation Softwares **Lab**	2	4	3	40	60	100
Course-11UPCSC1C25 Java Programming-**Lab**	2	4	3	40	60	100
Course-11UPCSC1C26 Open Source Softwares **Lab**	1	2	3	40	60	100
Course-11UPCSC1C27 Industrial Training	2	-	-	40	60	100
Semester-V						
Course-11UPCSC1C28 C# Programming	4	4	3	25	75	100
Course – 11UPCSC1C29 .Net Programming	4	4	3	25	75	100
Elective Course -IV	4	4	3	25	75	100
Elective Course -V	4	4	3	25	75	100
Elective Course – VI	4	4	3	25	75	100
Course-11UPCSC1C30 C# Programming-**Lab**	2	4	3	40	60	100
Course-11UPCSC1C31 .Net Programming-**Lab**	2	4	3	40	60	100
Course-11UPCSC1C32 Mini Project	2	2	3	40	60	100
Semester-VI						
Course-11UPCSC1C33 Dissertation and Viva-Voce	14	-	-	50	50 100*	200

Total no.Core	106					
of Elective	24					
Credits ⌡ Non Major **Elective**	12					
Grand Total	142					
Total Marks						4300

*Joint via-voce: **Internal Examiner**   :   **50 Marks**
                    External Examiner   :   **50 Marks**
                    External Evaluation   :   **50 Marks**

List of Electives:

Elective Course -I
Course 11UPCSC1E01   - Client / Server Architecture
Course 11UPCSC1E02   - Compiler Design
Course 11UPCSC1E03   - System Software
Course 11UPCSC1E04   - Management Information System

Elective Course -II
Course 11UPCSC1E05   - Object Oriented Analysis and Design
Course 11UPCSC1E06   - Software Engineering
Course 11UPCSC1E07   - Design and Analysis of Algorithms
Course 11UPCSC1E08   - Embedded Computing

Elective Course -III
Course 11UPCSC1E09   - Multimedia Database Management System
Course 11UPCSC1E10   - Data Mining
Course 11UPCSC1E11   - Software Testing
Course 11UPCSC1E12   - E – Commerce

Elective Course -IV

Course 11UPCSC1E13   - Virtual Reality
Course 11UPCSC1E14   - Software Project Management
Course 11UPCSC1E15   - Network Programming
Course 11UPCSC1E16   - Network Security and Cryptography

Elective Course –V

Course 11UPCSC1E17   - Enterprise Resource Planning
Course 11UPCSC1E18   - Mobile Computing
Course 11UPCSC1E19   - Artificial Intelligence & Expert Systems
Course 11UPCSC1E20   - WAP and XML

Elective Course –VI

Course 11UPCSC1E21   - Soft Computing
Course 11UPCSC1E22   - Digital Image Processing
Course 11UPCSC1E23   - Web Services
Course 11UPCSC1E24   - J2EE and J2ME

IA – INTERNALASSESSMENTS
ESE – END SEMESTER EXAMINATIONS

Core Course Code   **: 11UPCSC1C- -**
Elective Course Code   **: 11UPCSC1E-**

6. EXAMINATIONS

6.1 THEORY EXAMINATION
EVALUATION OF INTERNAL ASSESSMENT

Test	:	5 Marks
(Best one out of Two Tests)	:	
Model Examination	:	5 Marks)
Seminar	:	5 Marks
Assignment	:	5 Marks
Attendance	:	5 Marks

Total	:	25 Marks

No Internal Minimum

EVALUATION OFEND SEMESTER 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)

6.2 PRACTICAL \ MINIPROJECT EXAMINATION
EVALUATION OF INTERNAL ASSESSMENT

Test 1	:	20 Marks
Test 2	:	20 Marks
		(Best one out of Two Tests)
Test 3	:	20 Marks

Total	:	40 Marks

No Internal Minimum

EVALUATION OFEND SEMESTER EXAMINATIONS

Time duration: 3 Hours   Max. Marks: 60

7. QUESTION PAPER PATTERN

Questions may be taken from the list of practical problems. : 60 Marks

Distribution of the Marks

(i). Practical/Mini project

➢	Record Note Book	10
➢	Problem Understanding	10
➢	Implementation	20
➢	Debugging and Modification	10
➢	For correct output and viva	10

(ii). Industrial Training

➢	Internal Assessment	40
➢	Joint Via-voce	60

(Internal Examiner 30, External Examiner 30)

(iii). Dissertation

➢	Internal Assessment	50
➢	Report Evaluation by External Examiner	50
➢	Joint Via-voce	100

(Internal Examiner 50, External Examiner 50)

9. REGULATIONS FOR DISSERTATION WORK

➢ Students should attach themselves with well reputed Industry/Company/Institutions to do their five months dissertation work.

➢ The Candidate should submit the filled in format as given in Annexure–I to the department for approval during the First week of December during the even semester

➢ The review of the dissertation will be carried out periodically

➢ The student should submit three copies of their dissertation work.

➢ A sample format is enclosed in Annexure– II to prepare the dissertation

➢ Format for the title page and certificate are enclosed in Annexure– III.

➢ The students may use OHP/Power Point presentation during their dissertation Viva-Voce examinations.

10. PASSING MINIMUM

The candidate shall be declared to have passed in the theory/practical/Dissertation examination if the candidate secures

(i) 50% marks in the ESE and

(ii) 50% in ESE and IA put together

11. CLASSIFICATION OF SUCCESSFUL CANDIDATES

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 programme at the first appearance. Candidates who secure not less than 60% of the aggregate marks in the 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 pass all the examinations prescribed for the programme in first instance and within a period of three academic years from the year of admission are only eligible for University Ranking.

12. COMMENCEMENT OF THIS REGULATION

These regulations shall take effect from the academic year 2011-12, i.e., for students who are admitted to the first year of the course during the academic year 2011-12 and thereafter.

13. TRANSITORY PROVISION

Candidates who were admitted to the PG course of study before 2011-12 shall be permitted to appear for the examinations under those regulations for a period of three years after the completion of the programme.i.e, up to and inclusive of the examination of April/May 2012. Thereafter, they will be permitted to appear for the examination only under the regulations then in force.

PERIYAR UNIVERSITY, SALEM-11

Name   of the Department   :

Programme   :

Name of the Student   :

Register Number   :

Title of the Dissertation   :

Address of Organisation/Institution   :

Name of the External Guide   :

Designation   :

Place:

Date:

                                                   Signature of External Guide

                                                         (with seal)

Name of the Internal Guide   :

Qualifications   :

Teaching Experience   :

Place   :

Date   :

                                                   Signature of Internal Guide

Head of the Department

[Approved or not Approved]

[University Use]

ANNUXURE II
BONAFIDE CERTIFICATE
COMPANY ATTENDACE CERTIFICATE
ACKNOWLDGEMENT
CONTENTS

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

Name of the Student followed by initial

University Registration Number
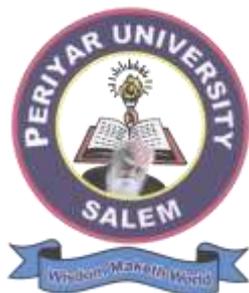
Department of Computer Science
PERIYAR UNIVERSITY
SALEM-636 011

MONTH – YEAR

B. Format of the Certificate:

Name and Address of the Internal Guide   Place
                                                    Date

<div align="center">

CERTIFICATE

</div>

This is to certify that the dissertation entitled ………………………………………………… submitted in partial fulfillment of the requirements of the degree of Master of Computer Applications to the Periyar University, Salem is a record of bonafide work carried out by ……………… under my supervision and guidance.

                                               [Name of the internal Guide]

Head of the Department

Date of Viva-voice:

Internal Examiner   External Examiner

SEMESTER I

Course-11UPCSC1C01 DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION4 Credits

Unit-I
Number Systems: Decimal, Binary, Octal, Hexadecimal-Conversion from one another-Binary Addition, Subtraction, Multiplication and Division. Codes-BCD Weighted -Excess-Gray - Error Detection Codes. Basic Logic Gates-Boolean laws and theorems-Sum of products - product of sums-Karnaugh map simplification methods-don't care conditions.

Unit-II
Data processing circuits-Multiplexers-Demultiplexers-Decoders-Encoders-Arithmetic Building Blocks: Half and Full Adder: Subtractor, adder -TTL circuits-CMOS circuit. Flip-Flops: RS, Clocked RS, D-Edge-Triggered D, JK, Master/slave flip-flop-clocks and timers-counters, Asynchronous counters, Synchronous counters-MOD3, MOD5, Shift counters.

Unit-III
Central Processing Unit: Introduction –General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation – Program Control - Reduced Instruction Set Computer (RISC).

Unit-IV
Input-Output Organization: Peripheral Devices – Input-Output Interface Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access (DMA) – Input-Output Processor (IOP) –Serial Communication.

Unit-V
Memory Organization: Memory Hierarchy – Main Memory – Auxiliary Memory – Associative Memory – Cache Memory – Virtual Memory – Memory Management Hardware. Control Unit:- Control Memory- Address Sequencing, Conditional Branching Mapping of Instruction Subroutines – Design of Control Unit , Micro program Sequencer, Problems.

TEXT BOOKS
1. Albert Paul Malvino, Donals P.Leach, "Digital principles and Applications", McGraw Hill Fifth Edition, 2004.
   Chapters: 2(1,2), 3(1,2,5,6,8), 5,6(1,2,9), 4 (1to 6), 6(7,8),   7(1,2,4),8(1,2,4,5), 10(1,3,7), 13(10).
2. M. Morris Mano, "Computer System Architecture", Prentice-Hall India Third Edition, 2005. Chapters 7(1, 2, 4), 8, 11, 12.

REFERENCE BOOKS
1. Thomas C.Bartee ,Digital Computer Fundamentals, Tata McGraw Hill, 1996.
2. M.Morris Mano, Digital Logic and Computer Design Prentice -Hall of India.

11UPCSC1C02OBJECT ORIENTED PROGRAMMING IN C++   **4 Credits**

Unit-I

C++ programming Basics: Statements – Arrays – Pointers – functions – structures – unions – Enumerations and User defined types – preprocessor directives.

Unit-II

Characteristics of Object Oriented Programming languages – Classes and objects – friend functions – Inline functions – constructors and Destructors – Static class members – Scope resolution operator – Nested classes - Passing objects to functions – Returning objects – Object assignment – References – Dynamic Allocation operators.

Unit-III

Function overloading – Default function argument – Operator overloading: Creating a member operator function – operator overloading using a friend function – overloading new and delete – overloading the comma operator.

Unit-IV

Inheritance – Type of Inheritance - Virtual base classes – pointers to derived classes – Virtual functions – Polymorphism - formatted I/O – I/O manipulators - Creating your own extractors & Inserters--File Handling- File I/O Basics – Binary I/O – Random access – Templates and Exception Handling.

Unit-V

Formatted I/O – I/O Manipulators – File Handling – File I/O Basics – Binary I/O – Random access – Checking the I/O status – customized I/O and files. Templates and Exception handling: class templates – function templates – member function templates – template arguments – exception handling.

TEXT BOOK:

1.   Herbert Schildt– C++ Complete Reference, Osborne McGraw Hill, II Edition, 1995.
     Chapters 1-21.

REFERENCES:

1. Robert Lafore – Object Oriented Programming in Microsoft C++,   Galgotia
     publication, 1993.
2. E. Balagurusamy, Object Oriented Programming with C++, PHI, 2003.
3. O.M.P. Bhave, S. A. Patekar, Object Oriented Programming with C++,   Pearson
    Education, Singapore Pvt Ltd., 2004.

Course 11UPCSC1C03   **DATA STRUCTURES**   **4 CREDITS**

Unit-I
Lists, Stacks, and Queues: Abstract Data Types (ADTs) – The List ADT – Simple Array Implementation of Lists – Linked Lists - Programming Details – Common Errors – Doubly and Circularly Linked Lists – Sorted Listed Lists, Inheritance, and Virtual Functions – Examples – Cursor Implementation of Linked Lists – The Stack ADT: Stack Model – Implementation of Stacks – Applications – The Queue ADT: Queue Model – Array Implementation of Queues – Applications of Queues.

Unit-II
Trees: Preliminaries: Implementation of Trees – Tree Traversals with an Application - Binary Trees: Implementation – Expression Trees – The Search Tree ADT – Binary Search Trees: Make – Empty – Find - Find _Min and Find_Max – Insert – Remove – Average- Case Analysis – AVL Trees: Single Rotation – Double Rotation – Splay Trees: A simple idea (That Does Not Work) – Splaying – Tree Traversals (Revisited) – B-Trees.

Unit-III
Hashing: General Idea – Hash Function – Open Hashing (Separate Chaining) – Closed Hashing (Open Addressing): Linear Probing – Quadratic Probing – Double Hashing – Rehashing – Extendible Hashing. Priority Queues (Heaps): Model – Simple Implementations – Binary Heap: Structure Property – Heap Order Property – Basic Heap Operations – Other Heap Operations – Applications of Priority Queues: The Selection Problem – Event Simulation – d-Heaps – Leftist Heaps: Leftist Heap Property – Leftist Heap Operations – Skew Heaps – Binomial Queues: Binomial Queue Structure – Binomial Queue Operations – Implementation of Binomial Queues.

Unit-IV
Sorting: Preliminaries – Insertion Sort: The Algorithm – Analysis of Insertion Sort – A Lower Bound for Simple Sorting Algorithms – Shell sort: Worst-Case Analysis of Shell sort – Heap sort – Merge sort: Analysis of Merge sort – Quick sort: Picking the Pivot – Partitioning Strategy – Small Files – Actual Quick sort Routines – Analysis of Quick sort – A linear-Expected-Time Algorithm for Selection – Sorting Large Objects – A General Lower Bound for Sorting: Decision Trees – Bucket Sort – External sorting: why we need new Algorithms – Model for External Sorting – The Simple Algorithm – Multiway Merge – Poly phase Merge – Replacement Selection.

Unit-V
Graph Algorithms: Definitions: Representation of Graphs – Topological Sort – Shortest- Path Algorithms: Unweighted Shirtest Paths – Dijkstra's Algorithm – Graphs with Negative Edge Costs – Acyclic Graphs - All-pairs Shortest Path – Network Flow Problems: A simple Maximum-Flow Algorithm – Minimum Spanning Tree – Prim's Algorithm – Kruskal's Algorithm – Applications of Depth-First Search: Undirected Graphs – Connectivity – Euler Circuits – Directed Graphs – Finding Strong Components – Introduction to NP-Completeness: Easy vs. Hard – The class NP – NP-Complete Problems.

Text Book:

1. Mark Allen Weiss "Data Structures and Algorithm Analysis in C++" (Internal Student Edition AWL),2011. Chapters: 3, 4, 5, 6, 7, 9

Reference Books:

1. A.V. Aho, J.E. Hopcroft, J.D. Ullman, The Design and Analysis of Computer algorithms, Addison –Wesley Publishing company, 1974.
2. Horowitz & Sahani, Fundamentals of Data Structures in Pascal, Galgotia Book Source, 1982.
3. A.V. Aho, J.E. Hopcroft, J.D. Ullman, Data structures and Algorithms, Addison – Wesley Publishing Company, 1987.

Course 11UPCSC1C04 MATHEMATICALFOUNDATIONS FOR COMPUTER SCIENCE 4 Credits

Unit-I   Mathematical Logic

Connectives – Negation – Conjunction – Disjunction – Statement formulas and Truth tables: Well-formed formulas – Tautologies – Equivalence of formulas - Duality law – Normal Forms: Disjunction Normal Form – Conjunctive Normal Form – Principal Disjunctive Normal Form – Principal conjunctive Normal Form.

Unit-II   Theory of inference

Validity using truth table – The Predicate Calculus – Predicates, Statement function, variables and Quantifiers – Inference Theory of predicate calculus: Valid formulae and Equivalence.

Unit-III   Relations and functions

Relation and Ordering – Relation – Properties of Binary relation in a set – Functions – Definition and Introduction – Composition of functions – Inverse functions – Binary and n-array operations – Hashing functions – Natural Numbers – Peano Axioms and Mathematical induction - Cardinality.

Unit-IV   Lattice and Boolean algebra

Lattices and Partially Ordered Sets – Definition and Example – Some Properties of Lattices – Lattices of Algebra system – Sub lattices – Direct Product and Homomorphism – Boolean Algebra – Definition and Example – Sub Algebra – Direct Product and Homomorphism – Boolean function – Boolean forms and Free Boolean Algebra – Values of Boolean Expression and Boolean Function.

Unit-V   Languages and finite state machines

Grammars and Languages: Discussion of Grammars – Formal Definition of Language – Finite State Machines – Introductory Sequential Circuit – Equivalence – of Finite State Machines – Finite State Acceptors and Regular Grammars.

Text Book:

1. J.P.Trembley and R.Manohar, Discrete Mathematical Structures with Applications to Computer Science, Tata McGraw Hill, New Delhi, 1997.

Sections: 1.4.1,1.5.1, 1.5.2, 1.6.1, 3.3.1 -3.3.2, 2.3.1, 2.3.2, 2.4.1-2.4.4, 2.4.6, 2.5.1, 2.5.2, 4.1.1, 4.1.4, 4.2.1, 4.2.2, 4.3.1, 6.1.1, 4.6.1, 4.6.2.

Reference Books:

1. James C.Abbott, Sets, Lattices and Boolean algebra, Allyn and Bacon, inc. Boston. 1969.
2. J.E.Hopcropt and J.D.Ullman, Formal Languages and Their Relations to Automata, Addison – Wesley Pub. Comp. Reading Mass, 1969.
3. H.G.Flegg, Boolean algebra and Its Applications, John Wiley and Sons Inc.New York, 1974.

Course 11UPCSC1C05 PROBLEM SOLVING TECHNIQUES   4 Credits

UNIT I   INTRODUCTION TO COMPUTER PROBLEM-SOLVING

Introduction - The Problem-solving Aspect - Top-down Design-implementation of Algorithms- Program Verification - The Efficiency of Algorithms. Fundamental Algorithms - Exchanging the values of Two Variables - Counting - Summation of a set of Numbers - Factorial Computation-Sine function computation - Generation of the Fibonacci sequence - Reversing the Digits of an Integer - Base Conversion Character to Number Conversion.

UNIT II   FACTORING METHODS

Finding the square Root of a number - The Smallest Divisor of an Integer - The Greatest Common Divisor of Two Integers - Generating Prime Numbers - Computing the Prime Factors of an Integer - Generation of Pseudo - random Numbers - Raising a Number to a Large Power - Computing the nth Fibonacci Number.

UNIT III   ARRAY TECHNIQUES

Array Order Reversal-Array Counting or Histogramming - Finding the Maximum Number in a Set - Removal of Duplicates from an Ordered Array - Partitioning an Array – Finding the kth Smallest Element - Longest Monotone Subsequence.

UNIT IV   C PROGRAMMING FUNDAMENTALS

Overview of C – Constants, Variables, Data types – Operators – Expressions – The Decision Control Structure – The Loop control Structure – The Case Control Structure – Functions and Pointers – Arrays – Pointers and Arrays – Two Dimensional Arrays – Array of Pointers – Three Dimensional Array – Puppetting on Strings – Structures.

UNIT V   ADVANCED FEATURES

File Input / Output – Data Organization – File Operations – File Modes – String (Line) or Record I/O in Files – Text Files and Binary Files – Database Management - Miscellaneous Features – Enumerated Data Type – Typedef – Typecasting – Bit Fields – Pointers to Functions – Functions Returning Pointers – Union of Structures – C Under Windows – DOS and Windows Programming Model – Hungarian Notation – Interaction With Hardware – Communication with Storage Device and Keyboard

Text Books

1. R.G.Dromey " How to Solve it by Computer ", Pearson Education, India, 2007. (Chapter s: 1, 2, 3, and 4)
2. Yashavant P. Kanetkar, "Let Us C", Fifth Edition, Sridhara Publication, India, 2008.

   (Chapters: 1, 2, 3, 4, 5, 8, 9, 10, 12, 15, 16, 19)

Reference Books

1. Sey mour Lipschutz, "Essentials Computer Mathematics", Schaums" outlines series, Tata McGrawHill Edition, 2004.
2. Kernigan Brian W., and Dennis M. Ritchie, "The C Programming Language", Second Edition, Prentice Hall, 1988.
3. Balagurusamy E, "Programming in ANSI C", Third Edition, Tata McGraw Hill, 2004.

Course 11UPCSC1C06OBJECT ORIENTED PROGRAMMING WITH C++ - LAB   2 Credits

Design and Implement the following:

1. Function Overloading

2. Functions with default arguments

3. Constructors and Destructors

4. Passing objects to functions by value and by reference

5. Friend functions

6. Inline functions

7. Operator Overloading

8. Inheritance

9. Pointers to objects

10. This pointer

11. Virtual functions

12. Formatted I/O

13. Files (Formatted and Unformatted)

14. Templates and Exception Handling

15. Extractors and Instructors.

Course 11UPCSC1C07   DATA STRUCTURES - LAB   2 Credits

Implement the following using C

1. Array Creation and Operations.
2. Recursion.
3. Infix to Prefix, Postfix Conversion.
4. Polynomial Addition Using Singly Linked List.
5. Doubly Linked List.
6. Linear Search.
7. Binary Search.

Implement the following using C ++

8. Stack Operation.
9. Queue Operation.
10. Tree Traversal Depth first search.
11. Graphs-Shortest Path
12. Shell sort.
13. Quick sort.
14. Heap sort.
15. Merge sort.

Course 11UPCSC1C08 **OFFICE AUTOMATION – LAB** 1Credit

MS –Word
1. Create a document and apply alignment and edit properties.
2. Create a table and apply its various properties.
3. Develop "Mail merge".

MS – Excel
4. Create an Excel sheet using the following operations
   i) Cell formatting.
   ii) Row/ Column formatting.
5. Create Chart applications.
6. Create an excel books that consists of various excel sheets.
   i). A work sheet should consist of tables &text.
   ii). A work sheet should consist of charts.
7. Create a Table of values and how apply mathematical functions

MS- Power point
8. Create Slides with different layout and apply different backgrounds.
9. Create slide with links and change the order of slides.
10. Create a slide with custom animation.
11. Create slides with action button and reverse using for the animation how.

MS- Access
12. Create a new database with various tables
13. Create different tables and assign relationships between them.
14. Create tables and develop action & cross tab queries
15. Create forms in column & tables style

Course 11UPCSC1C09RELATIONAL DATABASE MANAGEMENT SYSTEMS4 Credits

Unit-I

Introduction to Database Systems: Overview – Data Models – Database System Architecture – History of Database Systems. Diagram – Weak Entity Sets – Extended E-R Features – Design of an E-R Database Schema – Reduction of E-R Schema to Tables. Entity-Relationship Model: Basic Concepts – Constraints – Keys – Design Issues – Entity Relationship.

Unit-II

Relational Model: Structure of Relational Databases – Relational Algebra – Extended Relational Algebra Operations – Modification of Database – Views – Tuple Relational Calculus – Domain Relational Calculus. SQL: Basic Structure – Set Operations – Aggregate Functions – Null Values – Nested Sub queries –Modification of the database – Joined Relations– Embedded SQL – Dynamic SQL –Query-by-Example, Quel.

Unit-III

Integrity and Security: Domain Constraints – Referential Integrity – Assertions – Triggers – Security and Authorization – Authorization in SQL – Encryption and authentication. Relational Database Design: First Normal Form – Second Normal Form – Boyce-Codd Normal Form – Third Normal Form – Fourth Normal Form.

Unit-IV

Storage and File Structures: Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary Storage – Storage Access – File Organization – Organization of Records in Files – Data-Dictionary Storage. Indexing and Hashing: Basic Concepts – Ordered Indices – B^+-Tree Index Files – B-Tree Index Files – Static Hashing – Dynamic Hashing Index Definition in SQL – Multiple-Key Access.

Unit-V

Transactions: Transaction concept – Transaction State – Implementation of Atomicity and Durability – Concurrent Executions – Serializability – Recoverability – Implementation of Isolation – Transaction Definition in SQL – Testing for Serializability Concurrency Control: Lock-Based Protocols – Timestamp-Based protocols – Validation-Based Protocols – Multiple Granularity – Deadlock Handling. Recovery System: Failure Classification – Storage Structure – Recovery and Atomicity – Log-Based Recovery – Shadow Paging – Recovery with concurrent Transactions – Buffer Management – Failure with Loss of Non - volatile Storage.

TEXT BOOK

1. A.Silberschatz, N.F. Korth, S. Sudarshan, "Database System Concepts", 4th Edition – McGraw Hill Higher Education, International Edition 2002. Chapters: 1 to 7, 11, 12, 15 to 17

REFERENCE BOOKS

1. Fred R McFadden, Jeffery A Hoffer, Mary B. Prescott, "Modern Database Management", Fifth Edition, Addison Wesley, 2000.
2. R. Elmasri and S.B. Navathe Benjamin Cummings, "Fundaments of Database Systems", Redwood City, 1994.
3. B.C. Desai, "An Introduction to Database Systems", Galgotia Publication, New Delhi, 1995.

Course 11UPCSC1C10   MICROPROCESSORS   4 Credits

Unit-I

Introduction: Microprocessor system concepts, Microprocessor evolution, Areas of application. Microprocessor architecture and operation: Basic Microprocessor Architecture, Registers, Arithmetic and logic section, control section, Interface section, The 8085 Microprocessor, Architecture, timing and sequencing, state transition sequence, Memory and I/O synchronization. The wait state.

Unit-II

Programming the 8085: Instruction set, Programming Techniques, counter and time delay programs, stacks and subroutines, code conversion and BCD arithmetic programs. Memory Interfacings: Review of memory types and characteristics, compatibility between memory and microprocessor unit system bus, Address space, Partitioning of the Address space, Dynamic RAM Interfacing.

Unit-III

D/A and A/D conversion: variable - register network binary ladder-D/A converter-D/A accuracy and resolution A/D converter (simultaneous Conversion)-A/D conversion (counter method)-continuous A/D conversion-A/D techniques-Dual slope A/D Conversion-A/D accuracy and resolution.
Interfacing Peripherals: Review of data transfer techniques, I/O ports, programmable I/O ports, the 8155h-8255a programmable peripheral interface, 8085 interrupt structure, and 8259a programmable interrupt controller, 8254 programmable interval timer, DMA controller. Serial mode of data transfer, 8251a USART, standard interfaces, interfacing keyboard, interfacing displays, 8279 programmable keyboard display interfaces.

Unit-IV

The 8086 Processor – Software aspects Evolution of Microprocessors – 8086 architecture – Addressing modes. Instruction set and assembler directives – Assembly language programming – Interrupts and interrupt service routines.

Unit-V

The Pentium and Pentium Pro Microprocessors : Introduction – Introduction to the Pentium Microprocessor – Special Pentium Registers – Pentium Memory Management – New Pentium Instructions – Introduction to the Pentium Pro Microprocessor – Special Pentium Pro Features.

TEXT BOOK:

1. Gaonkar, "Microprocessor architecture, programming and applications", Wiley Eastern Ltd, 1987. (Chapter 3-5, 6-10, 13-15, 17)
2. Barry B.Brey, "The Intel Microprocessors, 8086/8088, 80186/80188. 80286,80386, 80486, Pentium, Pentium Processor, Pentium II, Pentium III, Pentium IV, Architecture, Programming & Interfacing", Sixth Edition, Pearson Education, 2002. (Chapters 2, 3, 8, 17)

REFERENCE BOOKS:

1. Kenneth L short, "Microprocessor and programming logic", PHI, 1988.
2. Ajith pal, "microprocessors, principles and applications", Tata McGraw Hill, 1990.
3. A.K. Ray & K.M. Bhurcandi, "Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing", Tata McGraw Hill, 2002 reprint.
4. Yu-Cheng, Glenn A. Gibson, "Microcomputer systems: The 8086/8088 Family architecture, Programming and Design", PHI 2003.
5. Peter Abel, "IBM PC Assembly language and programming", Prentice Hall of India Pvt, Ltd.
6. Barry B. Brey & C.R. Sarma , "The Intel Microprocessors – Architecture, Programming, and Interfacing", Pearson Education Pte. Ltd., 2005.
7. U.S. Shah, "Microprocessor and Microcontrollers", Tech-Max Publications, 2005

Course 11UPCSC1C11   SYSTEM ANALYSIS AND DESIGN   4 Credits

Unit-I
System Concepts and the Information Systems Environment: Introduction – The systems concept – Characteristics of a system – Elements of a system – Types of Systems – The system Development Life Cycle: Considerations for candidate systems – The role of the systems Analyst: Historical Perspective – The multifaceted role of the analyst – The Analyst/user Interface – Rising positions in system Development.

Unit-II
Systems planning and the Initial investigation: Determined the user's information Requirement. Case scenario problem – Definition and Project Initiation. Background Analysis. Fact – Finding. Fact Analysis, Determination of Feasibility. Information Gathering: Information Gathering tool – On site observation.

Unit-III
The tools of structured analysis: The Data flow diagram – Data dictionary – Decision tree and structured English – Decision table – Pros and Cons of Each tool – Feasibility Study: System Performance definition - Feasibility study – Cost/Benefit analysis.

Unit-IV
The process and stages of systems design – The process of Design – Design Methodologies – Major Development Activities – Audit considerations – Input – Output and Forms Design: Input Design. File organization.

Unit-V
System Testing and Quality Assurance: Introduction – System testing. The nature of test data – The test plan – Quality Assurance – Role of the Data Processing Auditor Implementation: Conversion – Post implementation Review – Software maintenance: – Security, Disaster/recovery and ethics in system development: System security – Ethics in system development.

TEXT BOOK:
1. Elias M. Awad, 'System Analysis & Design' II Edition –Galgotia Publication, 2003. Chapters: 1,2,3,4,5,6,7,8,9,10,11,12,13,16.

REFERENCE BOOKS:
1. James A. Senn, 'Analysis and Design of Information System', MGH, 1989.
2. Lee, 'Introducing Systems Analysis & Design', VOL. I & II Galgotia NCC.

Course: 11UPCSC1C12 **FRONT END TOOLS** 4 Credits

Unit-I

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- Variables-Datatypes-Constants.

UNIT – II

Decision Making Statements-Looping Statements-Built-In functions-Arrays –Control Arrays-Functions –Procedures-Menus- MDI forms – Mouse event procedures-Common dialog boxes.

Unit-III

Microsoft windows common controls- 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 – OLE Automation-Building COM/OLE DLL servers- OLE Drag and Drop

Unit-IV

ActiveX controls-Databases- DAO- Data Control- Remote Data Control- ADO Data Control-Registering An ODBC Source- Data-Bound Controls: From Text Boxes To Flex Grids

Unit-V

Developer 2000: Introduction to Oracle D2K- Oracle Forms- Oracle Reports- Oracle Graphs

Text Book

1.   Gary Cornell, "Visual Basic 6 from the ground up", TMH, 2005
       (Unit I-1V, Ch.3, 4,5,6,7,8,9,10,11,14,17,18,19,20,23)

2.   Steven Holzner **,"**Visual Basic 6 Black Book**",**The Coriolis Group.(Unit-V: Ch.24,25)

3.   Paul Hipsley, "Developing Client/Server Applications With Oracle Developer/2000",

     SAMS Publication.(Unit-V)

Course11UPCSC1C13 ASSEMBLY LANGUAGE PROGRAMMING LAB   2 Credits

Implement the following:

1. Study of Assembler (Turbo) and Assembles directives.

2. Study of INT 21H Functions for input and output.

3. 8-bit and 16-bit Addition

4. 8-bit and 16-bit Subtraction

5. 8-bit and 16-bit Multiplication

6. Packing of BCD digits.

7. Unpacking of BCD digits.

8. Conversion from BCD to ASCII.

9. Conversion from ASCII to BCD.

10. Delay loop implementation.

11. Arranging numbers in ascending order.

12. Arranging numbers in descending order.

13. MACROS – Examples.

14. Implementation of String Functions.

15. Displaying the contents of the memory locations.

Course 11UPCSC1C14 **RDBMS– LAB** **2 Credits**

1. Design a calculator.

2. Simple program using menu Design.

3. Simple program using Timer Control.

4. Simple programs with classes and objects

5. Preparation of student mark list

6. Railway Reservation system

7. Bank management system.

8. Hospital management system.

9. Handling Events

10. Creation of Active X controls

11. Simple Animations

Oracle
1. Simple Queries using DDL, DML, base Tables.

2. Simple Queries using DDL, DML base Views.

3. Column Reports Creation.

4. PL/SQL Procedures Creation.

5. Database Triggers Creation.

6. Reports Creation.

7. Built-in Functions Creation.

Course 11UPCSC1C15   FINANCIAL COMPUTING - LAB   1 Credit

1. Create a Single Ledger using display and alter commends
2. Create a Multiple Ledger using display and alter commends
3. Create Single group using display and alter commends
4. Create a multiple groups using display and alter commends
5. Create a voucher types like contra, credit & debit notes, purchase, sales, receipt and delivery notes.
6. Create a single stock group.
7. Create a multiple stock groups
8. Create balance sheet for various items
9. Create profit and loss account for various aspects
10. Prepare various types of vouchers like accounting, inventory, and import transaction

Course-11UPCSC1C16　　　　　**OPERATING SYSTEMS**　　　　4 Credits

Unit-I
Introduction: operating system structure-operating-system operations-process management-memory management-storage management-production and security. Process management: process-concept: process scheduling-operation on process-inter process communication. Process scheduling: scheduling criteria-scheduling algorithms-multiple-processor scheduling-thread scheduling.

Unit-II
Process coordination: synchronization: the critical section problem-Peterson's solution-synchronization hardware-semaphores. Deadlocks: deadlock characterization-methods for handling deadlocks-deadlock prevention-deadlock avoidance-deadlock detection-recovery from deadlock. Memory management: strategies: swapping-contiguous memory allocation paging structure of the page table-segmentation. Virtual memory management: demand paging-copy on-write-page replacement-allocation of frames-thrashing memory-mapped files.

Unit-III
Storage management: file system: file concept-access methods-directory structure-file sharing-protection-file-system implementation. Secondary-storage structure: overviews of mass storage structure-disk structure - disk attachment-disk scheduling. I/O systems -I/O hardware-application I/O interface–kernel I/O subsystem-transforming I/O request to hardware operations.

Unit-IV
The Kernel and Shell – Files - User names – Logging in – Logging out – Commands – Communication with other users – Files – Input and Output. Files: Directory hierarchy – Files systems – Manipulating and protecting files – File contents – Printing files – File archives and file compression. Process and Devices: Processes and Devices: Processes – Environment – Program control – Quotes and escapes – Devices – back quotes.

Unit-V
Introduction to shells: Shell syntax – Arithmetic – Making decisions – Loops – Searching for files – Formatted output – Passing information to scripts – Simple arithmetic – Pattern Matching –Entering and leaving the Shell - Scripts with options – Symbolic links – Setting up terminals - Sending and Trapping signals – Functions – Aliases –exec and eval mechanism – Sending data across networks –Make files – Safe programming . Regular expression and filters: Filters – Character-to Character transformation –Selecting line by content –Stream editor – Splitting a file according to context – Awk: Introduction –Invoking awk – Naming the fields – Formatted output – Patterns – Variables – Arguments to awk scripts – Arrays – Field and record separators – Functions.

TEXT BOOKS

1. Abraham silberschatz, Peter Baer Galvin, Greg Game "Operating system Principles" Seventh Edition, Willy Asia Student Edition, 2006
UNIT 1-3 Chapters: 1,3,5,6,7,8,9,10,11,12,13.
2. Mike Joy, Stepen Jarvis, M. Luck, "Introducing UNIX and Linux", Palgrave Macmillan, U.S.A
UNIT 4, 5 Chapters: 2.1, 2.2, 4.1 to 4.6, 5, 6, 7, 8, 9, 10, 11

REFERENCE BOOKS:

1. Charles Crowley, Operating System a Design Oriented Approach, Tata McGraw Hill Publishing Company limited 2005

2. H. M. Deitel, Operating System, Second edition, Pearson Education, 2003

3. John Goerzen, Linux Programming Bible, Wiley-Dream tech India (P) Ltd, 2004

4. Richard L. Peterson, The complete Reference "Linux", Fifth Edition, Tata McGraw-Hill Edition, 2005.

Course 11UPCSC1C17　　　　**WEB TECHNOLOGY**　　　　**4 Credits**

Unit – I: HTML & CSS
　　　　HTML Introduction – Basic HTML – The Document Body – Text –Hyperlinks – Adding MoreFormatting – Lists – Tables – Using Color and Images – Images – Multimedia Objects – Frames –Forms – The HTML Document Head in Detail – XHTML – CSS Introduction – Using Styles – Definingyour Own Styles – Properties and Values in Styles – Formatting Blocks – Layers.

Unit – II: XML & Ajax
　　　　Basic XML – Document Type Definition – XML Schema – Document Object Model – Presenting XML –Using XML Parser - Essential Ajax - Ajax and the DOM, XML, CSS and Dynamic HTML.

Unit – III: JAVA Script
　　　　What is Dynamic HTML – Java Script Basics – Variables – String Manipulation – MathematicalFunctions – Statements – Operators – Arrays – Functions – Data and Objects – Regular Expressions –Exception Handling – Builtin Objects – Events – Dynamic HTML with Java Script

Unit – IV: PHP & MySQL
Why PHP and MySQL - Server-Side Web Scripting - Getting Started with PHP - Adding PHP to HTML -Syntax and Variables - Control and Functions - Passing Information between Pages – Strings – Arrays and Array Functions – Numbers - MySQL Database Administration - PHP/MySQL Functions -Displaying Queries in Tables - Building Forms from Queries.

Unit –V: Perl
　　　　The Basic Perl Program – Scalars – Arrays – Hashes Control Structures – Processing Text – Regular Expressions – Using Files – Subroutines – Bits and Pieces – Handling XML with Perl – Handling the DOM with Perl.

Text Books
1. Web Programming (Building Internet Applications), Chris Bates 2nd edition, Wiley India private Ltd; New Delhi- 2002. Chapters Covers: 1-8, 14
2. Ajax Bible, Steven Hoizner, Wiley India private Ltd; New Delhi - 2007. Chapters Covers: 1, 8-11.
3. PHP5 and MySQL Bible, Tim Converse and Joyce Park with Clark Morgan, Wiley Publishing,Inc. 2004. Chapters Covers: 1-10, 14-17

Reference Books
1. 　　Steven M. Schafer, "HTML, CSS, JavaScript, Perl, Python and PHP - Web standards Programmer's Reference", Wiley Publishing, Inc. 2005.
2. 　　Mitch Conrad, Kay Ether, Michal D. Thomas, "XML problem Design – solution", Wiley India private Ltd; New Delhi- 2006.
3. 　　Steve Suehring, "JavaScript step by step" Prentice-Hall of India Private Limited, 2008.

Course 11UPCSC1C18   VISUAL C++ PROGRAMMING   4 Credits

Unit –I
Windows environment - A simple windows program - Windows and messages - Creating the window - Displaying the window - Message loop - The Window procedure - Message processing - Text output - Painting and repainting - Introduction to GDI - Device context - Basic drawing - Child window controls.

Unit II
Introduction to VC++-Application framework - MFC library - Visual C++ components - Event handling -Mapping modes - Colors - Fonts - Modal and modeless dialog - Windows common controls – Bitmaps.

Unit III
Menus - Keyboard accelerators - Rich edit control - Toolbars - Status bars - Reusable frame window base class - Separating document from its view - Reading and writing SDI and MDI Documents - Splitter window and multiple views - Creating DLLs - Dialog based applications.

Unit IV
ActiveX Controls Vs Ordinary windows controls - Installing ActiveX Controls - Calendar Control - ActiveX control container programming - Create ActiveX control at runtime - Component Object Model (COM) - Containment and Aggregation Vs Inheritance - OLE Drag and Drop - OLE embedded component and containers - Sample applications.

Unit V
Database management with Microsoft ODBC - Structured query language - MFC ODBC Classes - Sample database applications - Filter and Sort Strings - DAO Concepts - Displaying database records in scrolling view - Threading - VC++ Networking issues - WinSock - WinInet - Building a web client - Internet Information server - ISAPI server extension - Chat application

TEXT BOOKS
1.   Charles Petzold, "Windows Programming", Microsoft Press, Fifth Edition.(Unit-I)
2.   David J. Kruglinski, George Shepherd and Scot Wingo, "Programming Visual C++", Microsoft press, Fifth Edition (Unit-II –Unit-V) (Chapters: 1-5,8,13-18,20,22-24,26,28,31,32,34,35)

REFERENCES
1.   Steve Holtzner, "Visual C++ 6 Programming", Wiley Dreamtech India Pvt. Ltd., 2003.
2.   Mueller and John, "Visual C++ from the Ground up", 2nd Edition, Tata McGraw Hill, 1999.
3.   Bates and Tompkins, "Practical Visual C++", Prentice Hall of India, 2002.

Course 11UPCSC1C19   VISUAL PROGRAMMING LAB   2 Credits

Windows SDK / Visual C++

1.   Writing code for keyboard and mouse events.

2.   Dialog Based applications

3.   Exception handling

4.   Creating MDI applications

5.   Creating SDI applications

Visual C++

6.   Working with MFC

7.   Drawing in documents

8.   Menu, Accelerator

9.   Tool tip, Tool bar

10.   Dialog based application using MFC

11.   Creating DLLs and using them

12.   Data access through ODBC

13.   Creating ActiveX control and using it

14.   Graphics

15.   Animation

Course 11UPCSC1C20   OPERATING SYSTEMS LAB   2 Credits

Operating System Concepts:

1.   Implementation of Process Creation
2.   Implementation of Message Communication
3.   Implementation of Round Robin Scheduling algorithm
4.   Implementation of FCFS scheduling algorithm
5.   Implementation of Shared Memory Client/ Server techniques
6.   Implementation of Priority Scheduling algorithm
7.   Implementation of Segmentation concept
8.   Implementation of Paging algorithm
9.   Implementation of File System concept
10.   Implementation of Semaphore (Producer _Consumer Process)

SHELL SCRIPT

1.   Implementation of File status test command.
2.   Implementation of Student Grading Process
3.   Implementation of Menu driven Program
4.   Implement the Menu driven shell program to perform the following lists.
       i. Enter the sentence in file.
      ii. Search a whole word in an existing file.
     iii. Quit.
1.   Develop shell program using 3 arguments to take the pattern as well as input and output file names. If the pattern is found display "Pattern   found",   else   display "Error message", also check if right number of arguments is entered.

Course 11UPCSC1C21   WEB TECHNOLOGY LAB   2 Credits

1. Design Online Book Store using List and Frames

2. Design a Time Table using Table and Images

3. Embedding Video and Audio Files in HTML

4. Design Event Web Page using Style Sheet (Font/Text, Color and Border Properties)

5. Write an XML document to display your bio-data. Write an XSL style sheet and attach that to the XML document. Validate the document using DTD or XSD.

6. Write a Ajax Program to get the User name suggestions in Registration Form

7. Web page using XML with Java Script

8. Design Image Mapping using Java Script

9. Registration Form Validation using Java Script

10. Simple Game using Event handling in Java Script

11. History of web pages using DOM

12. String Functions in PHP

13. Accessing the Student Exam Result Database(MySQL) using PHP

14. Online Shopping cart with Table operations(Insert, Select, Delete, Update) using PHP

15. Pattern matching with regular expressions using Perl.

16. Database connectivity using Perl.

Course 11UPCSC1C22   COMPUTER NETWORKS   4 Credits

Unit- **I**
Introduction – Network Hardware – Network Software – Reference models: OSI Reference model – TCP/IP Reference model – Network Standardization Physical Layer: Transmission media –- Wireless transmission – Communication Satellites - PSTN.
(Chapters: 1.2, 1.3, 1.4, 1.6, 2.2 to 2.5)

Unit- **II**
Data Link layer: Design issues – Error Detection and Correction – Elementary Protocol – Sliding Window Protocol – Protocol verification. MAC sub layer: Channel Allocation problem – Multiple Access Protocols.
(Chapters: 3.1 to 3.5, 4.1, 4.2)

Unit- **III**
Network Layer: Design Issues – Routing algorithms – Quality of Service – Internetworking.
(Chapters: 5.1, 5.2, 5.4, 5.5)

Unit-**IV**
Transport Layer: Transport Service – Elements of Transport Protocol – Internet Transport Protocols: UDP – TCP.
(Chapters: 6.1, 6.2, 6.4, 6.5)

Unit- **V**
Application Layer: DNS – Electronic mail.   Network Security: Cryptography – Communication Security – Authentication Protocols –E-mail Security.
(Chapters: 7.1, 7.2, 8.1, 8.6, to 8.8)

Text Book
1.   Andrew S Tanenbaum, "Computer Networks", Fourth Edition, PHI   Private Limited, 2005.

Reference Books:
1.   Uyless Black, Computer Networks, Second Edition, PHI, 2005

2.   B.A. Forouzan, "Data Communication and Networking", Third Edition, Tata McGraw Hill, 2004.

Course-11UPCSC1C23   PROGRAMMING IN JAVA   4 Credits

Unit-I
Java Fundamentals- Data types – Operators – Control Statements- Classes and objects .

Unit-II
Methods and Classes - Inheritance – Packages – Interfaces – Exceptional Handling.

Unit-III
Collections- File and Streams – Networking –Event Handling – AWT: Windows, Controls, Layout Managers and Menus –Swing –JDBC.

Unit-IV
Java Servlets: Design – Life Cycle- cookies – Session tracking- Java Server Pages: Overview –Implicit Objects –Scripting –Standard Actions- Directives.

Unit-V
Remote Method Invocation: Remote Interface – Naming Class – RMI Security Manager Class – RMI Exceptions – Creating RMI Client and Server Classes – IIOP.

Text Books
   1. Herbert Schildt, The Complete Reference – Java 2, Seventh Edition,2006
      Chapters: 1-10,17,19,20,22-24, 29,31

   2. Deitel & Deitel , Java How to Program , Pearson Education ,Seventh Edition ,2008.Chapters : 18,20,24,25

Course 11UPCSC1C24   ANIMATION SOFTWARES   LAB   2 Credits

Photoshop
1. To design the text with image and adding the special effects on the respected text and image.
2. To develop the any natural picture

Premiere
3. To design the text with image and adding the special effects on the respected text and image.
4. To develop the any new model of picture

Illustrator
5. To design the text with image and adding the special effects on the respected text and image.
6. To develop the dancing text and image.

Flash
8. To design the text with image and adding the special effects on the respected text and image.
9. To develop the any natural picture

Director
10. To design the text with image and adding the special effects on the respected text and image.
10. To develop the animation of alphabet with relevant picture
11. To develop the any natural picture

Dream weaver
11. To design the text with image and adding the special effects on the respected text and image.
13. To be develop the any picture

Maya
14. To Create a Clip for a Character of the human Skeleton Components.
15. To develop the Rendering (The Real World) animations.
16. To develop the Maya Dynamics.

Course-11UPCSC1C25   JAVA PROGRAMMING LAB   2 Credits

Use JAVA Programming Language to implement the following:
1. Concept of different types of inheritance.
2. Concept of Interface.
3. Concept of Package.
4. To handle mouse events.
5. To handle keyword events
6. To create applets incorporating the following Features:
   a. Create a color palette with matrix of buttons
   b. Set background and foreground of the control text area by selecting a color from color palette.
   c. In order to select Foreground or background use check box control as radio buttons
   d. To set background images
7. To simulate the functions of simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -,*, % operations. Add a text field to display the result.
8. To Create Input output and Random files
9. To develop chat application with datagram sockets and datagram packets.
10. To invoke servlet from HTML forms.
11. To invoke servlet from Applets.
12. To invoke servlet from JSP.
13. Simple client/server application.
14. JDBC to interact with database.
15. To create multiple chat applications using TCP packets.

Course : 11UPCSC1C26 : OPEN SOURCE SOFTWARES LAB   1 Credit

1. Write a server side PHP program that displays marks, total, grade of a student in tabularformat by accepting user inputs for name, Register number and marks from a HTML form.

2. Write a PHP program that adds products that are selected from a web page to a shoppingcart.

3. Write a PHP program to create a directory, and to read contents from the directory.

4.   Design a feedback form for any of the University's websites using PHP. Use HTML. Your form   should have basic formatting features. Make necessary assumptions and indicate   them.

5. Design an online Examination form for the students to apply for the exams of theory as well   as practical courses. Try to place appropriate controls on the form. Write necessary code for the above problem using PHP or CGI using PERL.

6. Design an online-poll application. The application should consist of a question(s) and 3 answers (YES, NO and CANT' SAY). Depending upon the selection of the choice, it   should display the results in a Bar chart form.

Course 11UPCSC1C27 **Industrial Training** **2 Credits**

The Students are expected to submit a report along with computerization of minimum of two modules after taking industrial training programme during summer vocation. The necessary information should be collected during the training programme for computerization. The report should contain the following:

1. Introduction
2. Training modules
3. Implementation as per the requirement of organization.
4. Screen Shots

Course11UPCSC1C28   C# PROGRAMMING   4   Credits

Unit- I

Introduction to Computing and Programming – Programming Methodologies – Evolution of C# and .NET – Need for C# - First C# Program – Types of Applications Developed with C# - Elements of C# program – Compiling, Building, Running, Debugging and Creating an Application – Data Types and Expressions – Memory Locations for Data – Types Classes and Objects – Predefined Data types – Integral Data types – Floating-point types – Decimal types – Boolean Variables – Declaring Strings – Making Data Constant – Assignment Statements – Order of Operations – Formatting output.

Unit- II

Methods and Behaviours – Anatomy of Method – Calling Class Methods – Predefined Methods – Writing Your own Class Methods – The Object Concept - Your own Instance Methods – Calling Instance Methods – Types of Parameters – Making Decisions – Boolean, Conditional expressions – If..else Selection, Switch Selection Statements – Ternary Operator – Order of Operations.

Unit-III

Repeating Instructions – use a Loop – using the While statement – using the For statement Loop – Using the Foreach statement – using the Do … while structure – Nested Loops – Recursive Calls – unconditional transfer of control – deciding which loop to use - Arrays and Collections – array Basic, Declaration, Access, Class – arrays as Method Parameters – arrays in Classes – two-dimensional arrays – multidimensional arrays – Array List class, String Class and other Collection classes.

Unit- IV

Introduction to Windows Programming – contrasting Windows and Console Applications – Graphical User Interfaces – Elements of Good design – using C# and visual studio to create Window-based applications – Windows Forms – controls – Programming Based on Events – Delegates – Event Handling in C# - List Box, Combo Box, Menu Strip, Check Box, Radio Button and Tab Control Objects.

Unit-V

Working with Files – System I/O Name space – file and directory classes – file streams – Binary reader and writer classes – Database access using ADO .NET – Database Access - ADO .NET – data source configuration tools – Web-based Applications – ASP.NET – Web Forms page – Controls – Web Forms server controls – Validation, Custom and Composite controls – Web services – Smart device Applications.

Text Book

1.   Barbara Doyle, "Programming in C#", Course Technology, Cengage
     Learning , 2008.   (Chapter: 1,2,3,4,5,6,7,8,9,12,13,14)

Reference Books

1.   E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004
2.   J. Liberty, "Programming C#", 2nd edition, O'Reilly, 2002.
3.   Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.

Course 11UPCSC1C29   . NET PROGRAMMING   4Credits

Unit-I
Introduction to .NET – VB and VB.NET differences- Data types- Variables- Operators- Arrays- Conditional Logic

Unit-II
Procedures- Dialog Boxes- File IO and System Objects- Error Handling- Namespaces- Classes and Objects

Unit-III
Introduction to Data Access in .NET-   ADO.NET – Data Access in Visual Studio.NET – Windows Forms: Controls – Specific Controls
Unit-IV

ASP.NET Application Fundamentals – Page Rendering Model- Custom Rendered Controls – Composite Controls – Control Potpourri

Unit-V
Web Parts- Configuration – Logging in- Data binding – Web Site Navigation- Session State – Diagnostics and Debugging

Text books:

1. Bill Evjen, Jason Beres, et al**., "Visual Basic. NET Programming Bible**", Wiley India (P) Ltd.New Delhi, 2006.
   Chapters: 1,2,5,6,7,8,9,10,12,13,14,21,22,23,26,27

2. George Shepherd,**"Microsoft ASP.NET Step by Step "** , Prentice Hall of India Pvt. Ltd. 2008 .
   Chapters: 2,3,4,5,6,7,9,10,11,12,14,17

Reference Books
1. Thearon Willis , Jonathan Crossland, Richars Blair, "**Beginning VB .NET 2003"**, Wiley Dreamtech Publishers , 2004.
2. David Chappell , **"Understanding .NET"**, Pearson Education, 2002.
3. David.S.Platt, **"Introducing Microsoft .Net"**, PHI, 2003.
4. G.Andrw Duthie **,"Microsoft ASP .NET Programming with Microsoft Visual C# .NET step by step"**,PHI ,2003.

Course   11UPCSC1C30   C# PROGRAMMING LAB   2   Credits

1. To implement C# program using program control in Console Application.
2. To implement C# program using program control in Windows Application.
3. To Develop the C# Program for Payroll System using Classes and Constructors.
4. To implement C# program Scribble Mouse using Interface.
5. To implement C# program for String Handling using String and Arrays.
6. To implement C# program for Handling File Handling.
7. To Develop the C# program for Editorusing Windows Concept.
8. To Develop the C# program for Message Display using Windows Concept.
9. To implement the C# Program for Mouse Handling using Windows Concept.
10. To Develop the C# program for Pop-up Calculator using Activex Concept.
11. To implement C# program for Drawing controls using Windows Concept.
12. To Develop the C# program for Students Information using ADO.NET.
13. To Develop the C# program for Online Library using ADO.NET.
14. To Develop the C# program for Inventory Control using ADO.NET.
15. To implement the C# program for Traffic Control using COM Objects.

Course 11UPCSC1C31 .NET PROGRAMMING LAB 2 Credits

A. Implement the following using VB.NET

1. Creating and using Variables, Arrays and Structure
2. Creating and using Procedures
3. Using Decision Structures
    a. Checking User Input
    b. Confirming Application Close
4. Implementing Structured Exception Handling
5. Creating Menus , Status Bars and Toolbars
6. Create and open a connection to a database using ADO.NET
7. Create, read, update, and delete records in a database using ADO.NET

B. Implement the following using ASP.NET

1. Create a master page to serve as a template for the Web site's pages.
2. Create a admin page with an editable master-detail view for browsing, inserting, updating, and deleting records.
3. Create a simple web site
4. Create and open a connection to a database using ADO.NET
5. Create, read, update, and delete records in a database using ADO.NET
6. Use SqlDataSource to populate a DropDownList and GridView
7. Use ObjectDataSource to Populate a GridView
8. Create a feedback form.

Course 11UPCSC1C32   **Mini Project**   2 Credits

The students are expected to submit a mini project by collecting information within the University Departments/Sections or nearby organizations to design applications. The project report may contain the following:

1. Introduction
2. Data Collection
3. System development
4. Implementation
5. Conclusion

SEMESTER-VI

COURSE 11UPCSC1C33   **Dissertation and Viva Voce**   **14 Credits**

The students are expected to do their dissertation for one full semester by attaching themselves with a well reputed organization/research institution. The report should be submitted as per the format provided in Annexure II.

ELECTIVE COURSE –I

Course 11UPCSC1E01   **CLIENT /SERVER ARCHITECTURE**   4 Credits

Unit-I

Basic concepts of client /server: Characteristics. File servers –Data base servers - transaction servers – groupware servers – object servers – web servers – fat servers or fat clients – 2-tier – client/server building blocks - Operating system services: Base services –extended services – server scalability- client anatomy.

Unit-II

NOS middleware - peer-to-peer communication –Remote Procedure Calls –MOM middleware – SQL database servers: Server architecture – stored procedures – triggers – rules.

Unit-III

Online transaction processing – Decision support systems – OLTP vs. DSS – Data warehouses: elements – hierarchies – replication vs. direct access – replication mechanism — client/server transaction processing: transaction models – TP monitors.

Unit-IV

Groupware: Components – Distributed objects: components and distributed objects. CORBA: components - object management architecture (IORB) – services – business objects.

Unit-V

Client/server distributed system management-components - management application – Network management – OSI management framework - the desktop management interface - X/OPEN management standards – client/server application development tools - client /server application design.

TEXT BOOK
1.   Robert Orafli, Dan Harkey and Jeri Edwards, "Client/Server Survival guide", 3rd Edition Wiley India Edition, 2007.
      Chapters: 2,3,5,7,8,10,12,15,16,19,21,22,30,31,32.

REFERENCE BOOKS
1.   Dawna Travis Dewire, "Client /Server Computing", Tata Mc Graw Hill   2003.
2.   Robert Orafli, Dan Harkey and John Wiley, "The Essential client/server Survival guide", 2nd Edition Galgotia Publication, 2005

Course 11UPCSC1E02   **COMPILER DESIGN**   4 Credits

Unit-I
Introduction to compilers: Compilers and Translators – Structure of a Compiler – Lexical Analysis – Syntax Analysis – Intermediate code generation – Optimization – Code generation – Book keeping – Error handling – Compiler Writing tools – Lexical Analysis: The role of the Lexical analysis – A simple approach to the design of lexical analyzers – Regular expressions – Implementation of a lexical analyzer.

Unit-II
Basic Parsing techniques: Derivations and parse trees – Parsers – shift reduce parsing – Operator Precedence Parsing – Top down parsing – Predictive parsing – Automatic construction of efficient parsers: LR parsers – The Canonical collection of LR (0) items – Constructing SLR parsing tables – Constructing canonical LR parsing tables – Constructing LALR parsing tables – Using ambiguous grammars – An automatic parser generator – Implementation of LR parsing tables – Constructing LALR set of items.

Unit-III
Syntax- Directed translation: Syntax-directed translation schemes – Implementation of syntax-directed translators – Intermediate code – Postfix notation – Three address code, quadruples, and triples- Postfix translations.

Unit-IV
Symbol tables: The contents of a symbol table – Data structures for symbol tables – Representing scope information – Error detection and recovery: Errors – Lexical-Phase errors – Syntactic –phase errors – Semantic errors.

Unit-V
Introduction to Code optimization: The principal sources of optimization – Loop optimization – The DAG representation of basic blocks – Code generation: Object programs – Problems in code generation – A simple code generator – Peephole optimization.

Text Book:

1.   Alferd V.Aho and Jeffrey D.Ullman, "Principles of Compiler Design", Narosa Publishing House, 2002.
       Chapters: 1.1, 1.3, 1.4, 1.5 to 1.11, 3.2,3.3, 3.8, 4.2,5,6,7.1 to 7.4, 7.6, 7.10, 9,11,12.1 to 12.3, 15.1, 15.2,15.4, 15.7.

Reference Books:
1.   Alferd V. Aho, Ravi Sethi, Jeffery D.Ullman, "Compilers", Narosa Publishing House, 2002.
2.   Jean-Paul Tremblay and Paul G. Soreson, "Compilers Writing",   McGraw   Hill International Editions,   2000.

Course   11UPCSC1E03   SYSTEM SOFTWARE   4 Credits

Unit-I

System software and machine architecture – The Simplified Instructional Computer (SIC) - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

Unit-II

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes – Program relocation - Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass assemblers and Multi pass assemblers .

Unit-III

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options - Linkage Editors – Dynamic Linking – Bootstrap Loaders

Unit-IV

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion   –   Keyword   Macro   Parameters-Macro   within   Macro.

Unit-V

Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other   parts   of   the   system   –   User-Interface   Criteria.

TEXT BOOK

1.   Leland L. Beck, "System Software – An Introduction to Systems
      Programming",   Pearson   Education   Asia,   2005.

REFERENCE BOOKS

1.   D. M. Dhamdhere, "Systems Programming and Operating Systems", Second   Revised
      Edition,TataMcGraw-Hill,1999.
2.   John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 1972.

Course11UPCSC1E04   MANAGEMENT INFORMATION SYSTEM   4 Credits

Unit-I
Foundations of Information systems in Business – Foundations concepts: - Information Systems Technologies – What You need to know – System Concepts: A Foundation – Components of an Information System – Information System Resources – Information System Activities – Business Applications - Development and Management – The Fundamental Roles of IS Applications in Business – eBusiness in Business – Types of Information Systems – Managerial Challenges of Information Technology.

Unit-II
Data Resource Management – Managing data Resources - Foundation Data Concepts– Types of Databases – Data Warehouses and Data mining – The Database Management Approach - Implementing Data Resource Management – Database Management – Database Structures - Accessing Database –Database Development.

Unit-III
Introduction to eBusiness Systems – Functional Business Systems   - Marketing Systems – Manufacturing Systems – Human Resource Systems –Accounting Systems –Financial management Systems – Electronic Commerce Systems - Fundamentals – Introduction to e – Commerce – The Scope of eCommerce – Essential ecommerce Processes –Electronic Payment Processes – eCommerce Applications and Issues – Web Store Requirements.

Unit-IV
Decision Support in Business – Decision Structure – Security and Ethical Challenges – Computer Crime – Privacy Issues – Other Challenges –Health Issues – Security Management of Information Technology – Internet worked Security Defense– Other Security Measures.

Unit-V
Developing and Implementing Application Systems, Quality assurance and evaluation of Information Systems. Organization and management of the Information Resource function.

Text Books
1. Murdick, R.G.Ross J.E & Vlaggtt, J.R. "Information Systems for Modern Management", 3 rd Edition, Prentice Hall India, 1987.
    (Chapter : 1,3,5,7,11,)
2. James A.O'Brien ," Management Information Systems", Sixth Edition,Tata McGraw Hill Edition,2004.
    (Chapters: 18,19,20,21).

Reference Books
1.   Aktas "Structured analysis and Design of Information System,"   Prentice   Hall International (Paperback Edition).
2.   Soargue and Watson, "Decision Support System", 2nd Edn., Prientice Hall International, 1989.
3.   David, "Applied Decision Support", Prientice Hall International,1988.
4.   Kanter, J, " Management Information System", 3rd Edn, Printice Hall India, 1984.

Course 11UPCSC1E05 OBJECT ORIENTED ANALYSIS AND DESIGN   4 Credits

Unit-I

The Object Model: The evolution of the object model – Elements of the object model – Applying object model. Classes and Objects: The nature of an object – Relationships among objects.

Unit-II

Classes and objects: The nature of the class – Relationship among classes – The Interplay of Classes and Objects – On building quality classes and objects. Classification: The importance of proper classification – Identifying proper classes and objects – Key abstraction mechanism.

Unit-III

 Introduction to UML- Development Process- The Class Diagram: Essentials and Advanced Concepts- Sequence Diagrams- Object Diagrams

Unit-IV

Package Diagrams-Deployment Diagrams- Use Cases- State Machine Diagram

Unit-V

Activity Diagram- Communication diagram-Component Diagram-Collaborations-Interaction Diagram –Timing Diagram

Text Books :
1.   Grady Booch, " Object Oriented Analysis And Design", Addison Wesley, 1998. Chapters:2-4
2.   Martin Fowler, Kendall Scott, "UML Distilled", Addison Wesley, 3rd Edition, 2007 Chapters:1-12,14-17

Reference Books:

1.   James Rumbaugh, Ivar Jacobson, Grady Booch, " The Unified Modeling Language Reference Manual ", Addison Wesley, 1999.
2.   Erich Gamma, "Design Patterns", Addison Wesley.
3.   James Rumbough et al, "Object Oriented Modeling and Design", 1991.
4.   Ivar Jacobson, "Object Oriented Software Engineering; A Use Case Driven Approach", Addison Wesley, 1994.
5.   Eriksson, "UML Tool Kit", Addison Wesley.

Course-11UPCSC1E06   **SOFTWARE ENGINEERING**   4 Credits

Unit-I

Introduction to Software Engineering – The Evolving Role of Software – Software – Software Myths – The Software Process: – A Generic View of Process – Software Engineering a layered technology – A Process Framework – Process Models: -Prescriptive Models – The Waterfall Models- Incremental Process Models, Evolutionary Process Models- The Unified Process.

Unit-II

Requirements Engineering: - Requirements Engineering Tasks – Initiating the Requirements Engineering Process – Eliciting Requirements – Building the Analysis Model – Negotiating and Validating Requirements- Building the Analysis Model:- Requirements Analysis – Analysis Modeling Approaches – Data Modeling Concepts – Object Oriented Analysis – Scenario based Modeling - Flow oriented Modeling – Class Based Modeling – Creating a Behavioral Model.

Unit-III

Design Engineering: – Design Concepts – The Design Model – Pattern-Based Software Design – Creating An Architectural Design – Software Architecture – Architectural Styles and Patterns – Architectural design – Mapping Data Flow into a Software Architecture- Modeling Component level Design – What is a Component – Designing Class-Based Components – Designing Conventional Components.

Unit-IV

Testing Strategies: - A Strategic approach to Software Testing – Test Strategies for Conventional Software – Test Strategies for Object oriented Software – Validation Testing – System Testing - Testing Tactics:- Software Testing Fundamentals – White Box Testing: – Basis Path Testing – Control Structure Testing-Black box Testing :- Object oriented Testing Methods – Testing Patterns.

Unit-V

Web Engineering :- Web Engineering Layers – The Web Engineering Process – Quality Management :- Quality Concepts – Software Quality Assurance – Software Reviews – Formal Technical Reviews – Reengineering - Software Reengineering – Reverse Engineering – The Economics of Reengineering.

Text Book:

1.Roger S. Pressman, "Software Engineering a Practioner's Approach", Sixth Edition, McGraw-Hill Higher Education, 2006.

Chapters and Sections: 1.1, 1.2, 1.5, 2.1, 2.2, 3.1, 3.2, 3.3, 3.4, 3.6, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 8.7, 8.8, 9.3, 9.4, 9.5, 10.1, 10.3, 10.6, 11.1, 11.2, 11.5, 9.3, 9.4, 9.5, 10.1, 10.3, 10.6, 11.1, 11.2, 11.5, 13.1, 13.3, 13.4, 13.5, 13.6, 14.1, 14.3, 14.4, 14.5, 14.6, 14.7, 14.11, 16.2, 16.3, 26.1, 26.2, 26.3, 26.4, 31.2, 31.3, 31.6.

Reference Books:
1.   Ian Somerville, "Software Engineering", Seventh Edition, Pearson Education, 2005.
2.   Richard Fairly, "Software Engineering Concepts", TMGH, 2004.
3.   Rajib Mall, "Fundamentals of Software Engineering", PHI, Second Edition, 2000.
4.   Carlo Ghezzi, Mehdi Jazayeri, Dino Mndrioli, "Fundamentals of   Software Engineering ", Second   Edition, PHI/Pearson Education Asia, 2000

Course: 11UPCSC1E07   DESIGN AND ANALYSIS OF ALGORITHMS   4 Credits

Unit-I
Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work –   Mathematical analysis of non-recursive Algorithms – Non-recursive solution to the Matrix Multiplication - Mathematical analysis of recursive algorithms – Recursive solution to the Tower of Hanoi Puzzle.

Unit-II
Divide and conquer Technique – Multiplication of large integers – Strassen's matrix multiplication – Closest pair and Convex Hull Problems - Greedy method – Prim's algorithm – Kruskal's algorithm –   Dijkstra's algorithm.

Unit-III
Computing a binomial coefficient – Warshall's and Floyd' Algorithm – Application of Warshall's Algorithm to the digraph – Flyd's Algorithm for the all pairs shortest paths Problem - The Knapsack problem and Memory function.

Unit-IV
Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem –   Traveling salesman problem.

Unit-V
P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.

Text Book
1.   Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2008. (Chapters 1.1-1.3, 2.1, 2.3, 2.4, 4.5, 4.6, 8.2, 8.4, 9.1-9.3, 11.3, 12.1,12.2, 12.3)

Reference Books

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to   algorithms", Prentice Hall 1990.
2. S.K. Basu, "Design methods and Analysis of Algorithms", Prentice Hall , 2005.

Course 11UPCSC1E08   **EMBEDDED COMPUTING**   4 Credits

Unit-I
An Introduction to Embedded Processing :
Embedded Computing, Distinguishing Between Embedded and General-Purpose Computing – Characterizing Embedded Computing – Embedded Market Structure.
An Overview of VLIW and ILP:
Semantics and Parallelism – Design Philosophies – Role of the Compiler – VLIW in the Embedded and DSP Domains – Historical Perspective and Further Reading.

Unit-II
An Overview of ISA Design:
Overview – Basic VLIW Design Principles – Designing a VLIW ISA for Embedded Systems – Instruction-set Encoding – VLIW Encoding – Encoding and Instruction-set Extensions.
Architectural Structures in ISA Design:
The Datapath - Registers and Clusters – Memory Architecture – Branch Architecture – Speculation and Predication – System Operations.

Unit-III
Microarchitecture Design:
Register File Design – Pipeline Design – CLIW Fetch, Sequencing, and Decoding – The Datapath – Memory Architecture – The Control Unit – Control Registers – Power Considerations.
System Design and Simulation:
System-on-a-Chip (SoC) – Processor Cores and SoC – Overview of Simulation - Simulating a VLIW Architecture – System Simulation – Validation and Verification.

Unit-IV
Embedded Compiling and Tool chains:
Introduction – Embedded Cross-Development Toolchains – Structure of an ILP Compiler – Code Layout – Embedded-Specific Tradeoffs for Compilers – DSP-Specific Compiler Optimizations.
Compiling for VLIWs and ILP:
Profiling – Scheduling – Register Allocation – Speculation and Predication – Instruction Selection.

Unit-V
The Run-time System:
Exceptions, Interrupts, and Traps – Application Binary Interface Considerations – Code Compression – Embedded Operating Systems – Multiprocessing and Multithreading.
Application Areas:
Digital Printing and Imaging – Telecom Applications – Other Application Areas : Digital Video – Automotive – Hard Disk Drives – Networking and Network Processors.

TEXT BOOK

1. Joseph A. Fisher, Paolo Faraboschi, Cliff Young, Embedded Computing : AVLIW Approach to Architecture, Compilers, and Tools, Morgan Kaugmann Publishers An imprint of Elsevier, Elsevier Inc, 2005.

REFERENCE BOOKS

1. Wayne Wolf, Computers as Components: Principles of Embedded Computing System Design, Morgan Kaufman Publishers, 2001.
2. Jane.W.S. Liu Real-Time systems, Pearson Education Asia, 2000
3. C. M. Krishna and K. G. Shin , Real-Time Systems, ,McGraw-Hill, 1997
4. Frank Vahid and Tony Givargi, Embedded System Design: A Unified Hardware/Software Introduction,John Wiley & Sons, 2000.

ELECTIVE COURSE -III

Course 11UPCSC1E09   MULTIMEDIA DATABASE MANAGEMENT SYSTEM

4 Credits

Unit-I
Introduction-What is Multimedia-Early Hypertext and Collaborative Research-Multimedia and Personalized computing-Emerging applications-Multimedia Systems: The challenges-Distributed Multimedia Systems-Role of standards-Framework for Multimedia systems

Unit-II
Types of Multimedia Information- Multimedia Database Applications-   Multimedia Objects- Multimedia Database Management Systems-Multimedia Storage and Retrieval

Unit-III
Metadata for Multimedia: Metadata Classification- Metadata for Text, Speech, Images, Video –Multimedia data access – Access to Text, Speech, Images, Video data.

Unit-IV
Object Oriented Modeling –Temporal models-spatial Models- Multimedia Authoring-Querying Multimedia Databases- Multimedia communication: Retrieval Schedule Generation- Multimedia Server-client Interaction- Network support for multimedia communication

Unit-V
Multimedia Database Management Systems-Multimedia specific properties of an MMDBMS- Data Modeling in MMDBMS-MMDBMS -architecture: Distributed MMDBMS Architecture-Implementation consideration- MMDBMS implementation.

Text Books:

1.   B. Prabhakaran , **Multimedia Database Management Systems** , Springer International Edition, 2007, Chapters :1-8

2.   Ralf Steinmetz and Klara Nahrsredt, **Multimedia Applications**, Springer International Edition,2007. Chapter: 2

Reference Books:

1. Nigel Chapman and Jenny Chapman, "**Digital Multimedia** ", Wiley India Edition,2006.
2. Prabhat K. Andleigh and Kiran Thakrar, **"Multimedia Systems Design "**, Prentice Hall of India,2005.

3. Multimedia Systems, John F.Koegel Buford, Pearson Education,2003

Course 11UPCSC1E10   DATAMINING   4 Credits

Unit-I
Introduction – Data mining – Data mining functionalities – kinds of patterns can be mined – classification – Data mining task primitives-major issues. Data pre-processing – Data cleaning – Data Integration and Transformation – Data Reduction – Discretization and concept hierarchy generation

Unit-II
Data warehouse – A multidimensional data model – Data warehouse architecture – Data warehouse implementation – From data warehouse to data mining-Efficient methods for data Cube computation.

Unit-III
Mining Frequent Patterns, Associations and Correlations: Basic Concepts-Efficient and scalable Frequent Itemset Mining Methods-Mining Various kinds of association rules-from association Mining to correlation analysis-constraint-based Association Mining. Classification and prediction – Issues regarding classification and prediction – classification by decision tree induction- Bayesian classification- Rule based classification.

Unit-IV
Cluster Analysis – Types of Data in cluster analysis- A categorization of Major clustering methods - Partitioning methods- Hierarchical methods – Density – based methods -Grid based methods -Model based clustering methods – outlier analysis.

Unit-V
Mining Data Streams-Mining Time-Series Data-Mining Sequence patterns in Transactional Data Bases-Multimedia Data Mining-Text Mining-Mining the world wide web.

Text Book

1. Jiwei Han, Michelien Kamber, "Data Mining Concepts and Techniques", Morgan Kaufmann Publishers an Imprint of Elsevier, 2006.
   Chapters: 1,2,3, 4.1, 5, 6.1- 6.6, 7.1-7.8, 7.11,8.1-8.3, 10.3-10.5

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. John Wang, Encyclopedia of Data warehousing and Mining, Idea   Group Publishing, 2005.

Course 11UPCSC1E11   **SOFTWARE TESTING**   4 Credits

Unit –I:
Tackling the testing maze: Introduction – Sample application – The incremental testing approaches. **Test Outline:** Introduction – Sample application – The outline approaches – Evaluating the outline – Schedule estimation.

Unit –II:
Building a software testing environment: Creating an environment supporting of software testing – Minimizing risk – Writing a policy of software testing - Economic of testing – Testing an organizational issues – Management support for software testing – Building a structured approach to software testing – Developing a test strategy.
Building a software testing process: Software testing guidelines – workbench concepts – Customizing the software testing process – Process preparation checklist.

Unit – III:
Overview of the software testing process: Advantages of software testing process – The cost of computer testing – Seven steps software testing process – Workbench Skills.
Using tables and spreadsheets: Introduction – Sample application – Documenting test cases – State machines – Test case table with multiple inputs – Decision tables – Applications with complex data – Managing tests.

Unit – IV:
Testing software system security: Overview – Where vulnerabilities occur – Functional vulnerabilities – Vulnerable areas – Accidental versus intentional losses – Do Procedures – Output – guidelines.

Unit – V:
Testing objects – oriented software: Introduction – Comparing object- Oriented and Procedural software – System testing example – Unit testing of classes. **Testing web applications:** Sample application – functional and usability issues – Security testing – Database testing.

Text Books:
1. Louise Tamres, "Introducing software testing", Pearson education 2007.
   (Chapters 1, 2 – Unit – I, Chapters 4, 5 - Unit – III, Chapters 6, 7 - Unit – V)
2. William Perry, "Effecting methods for software testing", Wiley-India and sons, 2006. (Chapters 2, 3 – Unit – II, Chapter 6 - Unit – III, Chapter 20 – Unit – IV)

Reference Books:
1. Bovis Beizer, "Software testing Techniques", Dreamtech Press 2003.
2. Ilene Burnstein, "Practical software testing- A Process oriented approach", Springer-Verlay 2004.
3. Boris Beizer, "Black Box Testing", John Wiley and Sons 1995.
4. Elfriede Dustin, "Effective software is testing", Pearson Education 2003.

Course 11UPCSC1E12 **E-COMMERCE** 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 World Wide Web: The Internet Today – In the Beginning – Unique Benefits of the internet – Searching Online - Bulletin Board Systems (BBSs) and Pay Services –Some Web Fundamentals – The Language of the Internet – Managerial Implications.

Unit-II
Launching a Business on the Internet: The Lifecycle Approach – The Business Planning and Strategizing Phase – Hardware, software, Security, and the Setup Phase – The Design Phase – The Marketing Phase – The Fulfillment Phase – The Maintenance and Enhancement Phase – Designing Web Sites: What does a Web Site Do – The Lifecycle of Site Building – How to Build a Web Site – Web Navigation Design – Design Criteria – Hiring a Web Designer – Website Evaluation and Usability Testing: Anatomy of a Site – What's the Big Fuss Over Cookies –Makes a Web Site Usable – Web Site Content and Traffic Management.

Unit-III
Payment Systems: From Barter to Money – Requirements for Internet-based Payments – Electronic Payment Media – Issues and Implications – E-Security: Security in Cyberspace – Designing for Security – how Much risk Can You Afford – The Virus: Computer Enemy Number One – Security Protection and Recovery – How to Secure 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 to Your Site – Tracking Customers – Customer Service – managing Implications – Web-Based Business-to-Business E-Commerce: B2B E-Commerce – B2B Models – B2B Tools-EDI – Beyond B2B: A2Z – Management Implications.

Unit-V
Intranets and Extranets: Intranets: The Basics – The Technical Infrastructure – Planning an Intranet – E-Mail and the Intranet – Extranets –Management Implications – Legal and Ethical Issues, Legal Issues - Ethical Issues- Management Implications.

Text Books
1. Elias M.Awad, "Electronic Commerce, PHI, 2006. (Chapters:1,2,3,5,6,8,9,11,12,13, 14,15)

Reference Books
1. Kamalesh K.Bajaj, Debjani Neg, "E-Commerce the Cutting Edge of Business", TMH, 2000.
2. S. Jaiswal, "Doing Business on the Internet E-Commerce", Galgotia, 2002.

Course 11UPCSC1E13   **VIRTUAL REALITY**   4 Credits

Unit-I
Virtual Reality and Virtual Environments: Introduction – Computer graphics – Real-time computer graphics – Flight simulation – Virtually environments. **The Historical Development of VR:** Introduction – Scientific landmarks.
3D Computer Graphics: Introduction – The virtual world space – Positioning the virtual observer – The perspective projection – Human vision – Stereo perspective projection – 3D clipping – Colour theory – Simple 3D modeling – Illumination models – Reflection models – Shading algorithms – Radiosity – Hiddeny-surface removal – Realism – Stereographic image.
(Chapters: 1, 2, 3)

Unit-II
Geometric Modelling: Introduction – From 2D to 3D – 3D space curves – 3D boundary representation. **Geometrical Transformations:** Introduction – Frames of reference – Modelling transformations – Instances – Picking – Flying – Scaling the VE – Collision detection.
(Chapters: 4, 5)

Unit-III
A Generic VR System:
Introduction – The virtual environment – The computer environment – VR technology – Modes of interaction – VR systems. **Animating the Virtual Environment:** Introduction – The dynamics of numbers – The animation of objects – Shape and object inbetweening – Free-from deformation – Particle systems. (Chapters: 6, 7)

Unit-IV
Physical Simulation: Introduction – Objects falling in a gravitational field – Rotating wheels – Elastic collisions – Projectiles – Simple pendulums – Springs – Flight dynamics of an aircraft. **Human Factors:** Introduction – The eye – The ear – The somatic senses – Equilibrium.(Chapters: 8, 9)

Unit-V
Virtual Reality Hardware: Introduction – Sensor hardware – Head-coupled displays – Acoustic hardware – Integrated VR systems. **Virtual Reality Software:** Introduction – Modelling virtual worlds – Physical simulation – VR toolkits. **Virtual Reality Applications:** Introduction – Engineering – Entertainment – Science – Training.
(Chapters: 10, 11, 12)

Text Book
1.   John Vince, "Virtual Reality Systems", Pearson Education Ltd., ACM Press, 1995.

Reference Books:

1. Nathaniel I. Durlach and Anne S. Mavor, "Virtual Reality: Scientific and Technological Challenges", Committee on Virtual Reality Research and Development, National Research Council, National Academy Press, 1995.
2. Newquist HP, Gerald Marks, "Virtual Reality/Book and 3-D Glasses", Scholstic; Book and Access edition, 1995.
3. Joey W. Hill, "Virtual Reality.", Ellora's Cave Taboo, 2005.

Course 11UPCSC1E14   SOFTWARE PROJECT MANAGEMENT   4 Credits

Unit-I

Introduction to Software Projects – An Overview of Project Planning – Project Management and Evaluation .

Unit-II

Selection of an appropriate Project approach – Software effort Estimation -Activity Planning :- Project Schedules – Sequencing and Scheduling Projects – NetworkPlanning Model – forward and backward pass-Identifying the Critical path-Activity float-Shortening Project Duration – Identifying Critical Activities-precedence networks.

Unit-III

Risk Management – Resource Allocation – Monitoring and Control

Unit-IV

Managing People and Organizing Teams – Software Quality -Planning for Small Projects.

Unit-V

Case Study – PRINCE Project Management, BS 6079:1996

Text Book:

1.   Mike Cotterell, Bob Hughes , "**Software Project Management**", Inclination/Thomas Computer Press, 4th Edition, 2004. Chapters : 1-13

Reference Book:

1.   Darrel Ince, H.Sharp and M.Woodman**," Introduction to Software Project Management and Quality Assurance"**, Tata McGraw Hill, 1995.

Course 11UPCSC1E15   NETWORK PROGRAMMING   4 Credits

Unit-I

      Introduction :UNIX Architecture - Logging In – Files and Directories – Input and Output – Programs and Processes – Error handling – User Identification – Signals – Time values – System Calls and Library functions – Standards and Implementation : UNIX Standardization – Implementations – Limits –Process Environment: main() – Process termination – Command line arguments – Environment list and variables. Process Control: Identifiers –fork () , vfork(), exit(), wait().
Chapters: 1, 2.2, 2.3, 2.5, 7.2 to 7.5, 7.9, 8.2 to 8.8

Unit-II

      exec functions – Changing User IDs and Group IDs – System function – Process accounting – User identification – Process times. Process relationships: Terminal logins – Network logins – Process groups – Sessions – Controlling terminals – tcgetpgrp (), tcsetpgrp () – Job control – Shell execution of programs – Orphaned process groups. Daemon Processes: Characteristics –Coding rules.
Chapters: 8.10, 8.11, 8.13 to 8.16, 9.2 to 9.10, 13.2, 13.3

Unit-III

      Socket Introduction: Socket address structure – Byte ordering and manipulation functions – Address conversions functions. Elementary TCP sockets: Introduction – socket, connect, bind, listen, accept, close functions – Concurrent server – Server host crashes, rebooting and shut down. I/O multiplexing: I/O models – select () – shutdown () – poll ().
Chapters: 3.1 to 3.8, 4.1 to 4.6, 4.8, 5.14 to 5.16, 6.2, 6.3, 6.6, 6.10

Unit-IV

      Socket options: getsocket () and setsocket () – Generic socket options – IP socket options (IPv4 and IPv6) – ICMP socket options – TCP socket options. Elementary UDP sockets: recvfrom and sendto functions – Lost datagrams – Verifying received response – Server not Running – connect () with UDP – Lack of flow control – Determining out going interface – TCP and UDP echo server using select () – DNS – gethostbyname() – gethostbyaddr () – getservbyname() and getservbyport ().
Chapters: 7.1 to 7.2, 7.2, 7.5 to 7.9, 8.2, 8.7 to 8.9, 8.111, 8.13 to 8.15, 11.2 to 11.5

Unit-V

      IPv4 and IPv6 interoperability – Routing sockets – Key management sockets : Reading and Writing – SADB – SA – Maintaining SAs – Broadcasting : Address – Unicast Vs Broadcast – Multicasting : Multicast Vs Broadcast – Multicasting on LAN – Multicasting on WAN – Threads: Creation and Termination – Raw sockets : Creation – Input – Output – ping program – trace route program.
Chapters: 12, 18, 19.2 to 19.5, 20.2, 20.3, 21.2 to 21.4, 26.2, 28.2 to 28.6

Text Books:
1. W. Richard Stevens, Stephen A. Rago, "Advanced Programming in the UNIX Environment", Second Edition, Pearson Education, New Delhi, 2007.
   For Units I and II
2. W.R.Stevens, B.Fenner, A.M.Rudoof, "UNIX Network Programming" Volume I, Third Edition, PHI Private Ltd, New Delhi, 2005.
   For Units III to V

Reference Books:
1. Sumitabha Das, "Your UNIX the ultimate Guide", Tata McGraw Hill, 2002.
2. Ashok Arora, S. Bansal, "UNIX and C Programming" First edition, Firewall media, 2005.

Course 11UPCSC1E16 NETWORK SECURITY AND CRYPTOGRAPHY 4 Credits

Unit-I
Overview: Services, Mechanisms, and Attacks – The OSI Security Architecture – A Model for Network Security – Classical Encryption Techniques: Symmetric Cipher Model – Substitution Techniques – Transposition Techniques – Rotor Machines – Steganography.

Unit-II
Block Ciphers and the Data Encryption Standard Simplified DES – Block Cipher Principles – The Data Encryption Standard – The Strength of DES – Differential and Linear Cryptanalysis – Block Cipher Design Principles – Block Cipher Modes of Operation.

Unit-III
Advanced Encryption Standard: Evaluation criteria for AES – The AES Cipher – Contemporary Symmetric Ciphers: Triple DES – Blowfish – RC5 – Characteristics of Advanced Symmetric Block Ciphers – RC4 Stream Cipher.

Unit-IV
Confidentiality Using Symmetric Encryption: Placement of Encryption Function – Traffic Confidentiality – Key Distribution – Random Number Generation – Public – Key Cryptography and RSA: Principles of Public-key Cryptosystems – The RSA Algorithm.

Unit-V
Key Management – Diffie-Hellman Key Exchange – Authentication Requirements – Authentication Functions – Digital Signatures and Authentication Protocols: Digital Signatures – Authentication Protocols – Digital Signature Standard.

Text Book:
1. William Stallings, "Cryptography and Network Security – Principles and Practices", Pearson Education / PHI, 3rd Edition, 2005. (Chapters: 1.1 – 1.3, 2.1 – 2.5, 3.1 – 3.8, 5.1, 5.2, 6.1 – 6.5, 7.1 – 7.4, 9.1, 9.2, 10.1, 10.2, 11.1, 11.2, 13.1 – 13.3)

Reference Books:
1. C. P. Pfleeger, S. L. Pfleeger, "Security in Computing", Pearson, 3rd Edition, 2003.
2. Bruce Schneier, Niel Ferguson, "Practical Cryptography", Wiley, 2003.

Course11UPCSC1E17   **ENTERPRISE RESOURCE PLANNING**   4 Credits

Unit-I

Introduction: Definition – Functional modules – Evolution of ERP systems – Characteristics – Process Integration – Benefits of ERP application – Technology in ERP systems – Implementation costs – Implementation challenges – Facts about Implementations – ERP Implementation in India – ERP Market and Vendors   : ERP Market – Vendors – Service oriented on Architecture – ERP Package feature – ERP Packages.

Unit- II

Extended ERP Services : Definition – SCM and ERP – ERP and BI – ERP and E-Commerce – Business Process – Re-engineering and ERP : Definition of ERP – Enterprise Redesign Principles - BPR Vs Total Quality – BPR and change management – Implementation approaches – Implementation methodology – Role of IT in BPR – BPR and ERP systems – BPR Success / Failure factors – BPR Implementation cases.

Unit-III

Planning for ERP: Planning for Implementation – Organizational Requirements –Economic and strategic justification – Analyzing Project scope and Broad implementation approach – Determining resources – Top management commitment – Realizing the commitment – Matching with right ERP systems – Creating a budget – Selecting the right ERP package – Organization preparation – Implementation of ERP: Design – Approaches –Lifecycle – Examples.

Unit- IV

Managing ERP Projects: Risk/Failure factors – Examples of ERP failure – Implementation risks – Management and Complexity of ERP Projects – Training users –Evaluating ERP projects. Going Live and Post implementation: Preparing to GO Live – Strategies for migration to new ERP systems – GO Live performance surprises – Managing after GO Live – Maintenance of ERP systems.

Unit-V

        Expanding ERP boundaries: Service oriented architecture – Enterprise Application Integration – Application service provider model. Case studies: Manufacturing Industries – Service Industries – Governmental Organizations

Text Book

1. Ashim Raj Singla, "Enterprise Resource Planning", Cengage Learning India Pvt Ltd, New Delhi 2008.
   Chapters: 1 to 9.

Reference Book

1. Leon Alexis, "Enterprise Resource Planning", Tata McGraw Hill, New Delhi, 1999.

Course 11UPCSC1E18   MOBILE COMPUTING   4 Credits

Unit-I

Introduction – Applications – History of wireless communication – A Simplified reference model - Wireless transmission – Frequencies for radio transmission – Regulations – Signals – Antennas - Signal propagation: Path loss of radio signals - Additional signal propagation effects - Multi-path propagation – Multiplexing - Modulation

Chapters: 1, 2.1 to 2.6

Unit-II

Spread spectrum – Direct sequence spread spectrum – Frequency hopping spread spectrum – Cellular systems. Medium access control: Hidden and exposed terminals – Near and far terminals – SDMA, FDMA, TDMA, Fixed TDM, Classical Aloha, slotted Aloha, Carrier sense multiple access – Reservation TDMA – Multiple access with collision avoidance – Polling – CDMA – Spread Aloha multiple access.
Chapters: 3.1 to 3.3, 3.4.1 to 3.4.4, 3.4.7 to 3.4.9, 3.5.1

Unit-III

Comparison of S/T/F/CDMA.GSM: Mobile services – System architecture – Radio interface – Protocols – Localization and calling – Handover – Security – New Data services. UMTS and IMT-2000 - Satellite Systems: Applications – Basics – Routing – Localization – Handover.Chapters: 3.6, 4.1.1 to 4.1.8, 4.4, 5.2 to 5.6

Unit-IV

Wireless LAN: Infra red vs. radio transmission – Infrastructure and ad-hoc network – IEEE 802.11 – System architecture – Protocol architecture – Physics layer – Medium access control layer – MAC management – Blue tooth. Mobile network layer: Mobile IP: Goals, assumptions and requirements – entities and terminology – packet delivery – Agent discovery – Registration – Tunneling and encapsulation Recent technologies
Chapters: 7.1 to 7.3.5, 7.5, 8.1.1 to 8.1.6

Unit-V

Mobile ad-hoc networks - World Wide Web – WAP: Architecture – wireless datagram Protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML script – Mobile computing applications using J2ME.Chapters: 8.3, 10.2, 10.3.1 to 10.3.8

Text Book:

1.   Jochen Schiller, "Mobile Communications", Second Edition, Pearson Education, 2009.

References Books:

1.   Rifaat A. Dayen "Mobile Data & Wireless LAN Technologies", Prentice Hall, 1997.
2.   Steve Mann and Scoot Schibli, "The Wireless Application Protocol", John Wiley & inc., 2000.
3.   Steve Mann, "Programming Applications with the Wireless Application   Protocol", John   iley & Sons, Inc., 2000.

Course 11UPCSC1E19   ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS   4 Credits

UNIT – I

The AI problems – AI techniques – problems, problem space & search – Defining the problem as a state search – production systems – problem Characteristics – Heuristic search techniques – Generate & test – hill climbing – Best first search – problem reduction.

UNIT – II

Game playing mini-max procedure – Adding alpha-beta Cutoffs – Using predicate logic – Representing simple facts & logic – Representing instance & is a relationships – computable functions & predicates – Resolution – Natural Deduction.

UNIT – III

Representing knowledge using rules – Procedural Versus declarative knowledge – logic programming – Forward Versus backward reasoning – Matching – Control knowledge – Symbolic reasoning under uncertainty – Introduction to non-monotonic reasoning – logics for non-monotonic reasoning.

UNIT – IV

Expert systems – Definition – Expert Systems Versus Conventional programs – knowledge representation using rules – knowledge representation using semantic nets – knowledge representation using Frames – stages of building an Expert system – choosing a tool for ES.

UNIT – V

Difficulties in developing an ES – Inherent limitations of ES – common pitfalls in planning an ES – choosing an appropriate problem – Resources for building the system – choosing the ES – building a tool – pitfalls in dealing with the domain expert – pitfalls during the development process.

TEXT BOOKS

1. 'Artificial Intelligence' – Elaine Rich, Kevin Knight, Tata Mc Graw Hill, II Edition. (Chapters 1, 2, 3, 4, 5, 6, 7, 12,15)
2. 'A Guide to Expert Systems' – Donald A. Waterman, Pearson Education, Addision Wesley. (Chapters 1, 2, 3, 4, 7, 9, 12, 13, 16, 17, 18, 19)

REFERENCE BOOKS

1. 'Artificial Intelligence' – Nills J. Nilsson, Narosa pub.
2. 'Artificial Intelligence' – P.H. Winston, Addison Wesley
3. 'Principles of AI & ES Development' – David W. Rottson, MGH
4. 'Building ES' – Fredrick Hayer Roth Donald A. Waterman & Doughlas B.Leant, Addison Wesley.

Course 11UPCSC1E20   **WAP AND XML**   **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   - Chapter: 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

<center>**ELECTIVE COURSE –VI**</center>

Course 11UPCSC1E21   SOFT COMPUTING   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: Back propagation 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: Fuzzy Sets and Systems

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

Unit-IV: Genetic Algorithms

Genetic Algorithms: History – Basic concepts – Creation of offsprings – Working principle – Encoding – Fitness function – Reproduction.

Unit-V: Genetic Modelling

Inheritance operators – Cross over – Inversion and deletion – Mutation operator – Bitwise operators – Bitwise operators used in GA - Generation cycle – Covergence of Genetic algorithm- 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, 6.3, 6.5, 7.3-7.6, 8.1-8.7, 9.1-9.9)

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.
3. Randy L. Haupt, Sue Ellen Haupt, Practical Genetic Algorithms, Second Edition, Wiley Interscience, A John Wiley & Sons, Inc., Publication. (Chapters 1,2 & 6.1)

Course 11UPCSC1E22   DIGITAL IMAGE PROCESSING   4   Credits

Unit-I
DIGITAL IMAGE FUNDAMENTALS
Image formation, Image transforms – Fourier transforms, Walsh, Hadamard, Discrete cosine, and Hotelling transforms.

Unit-II
IMAGE ENHANCEMENT & RESTORATION
Histogram modification techniques - Image smoothening - Image Sharpening - Image Restoration - Degradation Model – Noise models - Spatial filtering – Frequency domain filtering.

Unit-III
IMAGE COMPRESSION & SEGMENTATION
Compression Models - Elements of information theory - Error free Compression -Image segmentation –Detection of discontinuities - Edge linking and boundary detection - Thresholding – Region based segmentation - Morphology.

Unit-IV
REPRESENTATION AND DESCRIPTION
Representation schemes- Boundary descriptors- Regional descriptors - Relational Descriptors

Unit-V
OBJECT RECOGNITION AND INTENTERPRISE RESOURCE PLANNINGRETATION
Patterns and pattern classes - Decision-Theoretic methods - Structural methods.

TEXT BOOK:

1. Gonzalez.R.C & Woods. R.E., Digital Image Processing, 2ndEdition, Pearson Education, 2002. (Chapters: 1, 2, 3, 4, 5, 8, 9, 10, 11 and 12).
2. Anil Jain.K, Fundamentals of Digital image Processing, Prentice Hall of India, 1989. (Chapters: 5, 7, 8 and 11).

REFERENCE BOOKS:

1. Sid Ahmed, Image Processing, McGraw Hill, New York, 1995.
2. Milan Sonka, Vaclav Hlavac and Roger Boyle, "Image processing Analysis and Machine vision", Second Edition, Thomson Brooks/Cole, 1999.
3. Chanda & Majumdar, Digital Image Processing and Analysis, Prentice Hall, 3rd Edition.

Course 11UPCSC1E23　　　　　　　**WEB SERVICES**　　　　　4 Credits

Unit–I

Web services – web services and their approach to distributed computing – Web services technology – Web services architecture .

Unit–II

Basic Web services Technology – A Minimalist infrastructure for web services – SOAP – Simple Object Access Protocol – WSDL Web Services Description Language – UDDI: Universal Description Discovery and Integration – Web services at work – Interactions between the specifications – Related Standards.

Unit – III

Creating and Using web services :- Understanding XML based web services – SOAP and web services – Additional needs for web services - creating a web service – Declaring a web service – Creating the web service class – Advertising a web service – Securing a web service – Exploring authentication options .

Unit – IV

Using a web service - Locating a web service – Understanding WSDL files – Creating a proxy class – MakeServices.bat – How the proxy code Works

Unit – V

Service Coordination Protocols – An Introduction to coordination protocols – Infrastructure for coordination protocols –WS- coordination – WS- Transaction – Rosetta Net – Other standards Related to coordination protocols .

Text Books

1. Alonso Casati , Kuno ,Machiraju, "Web services Concepts Architectures and Applications- Springer International Edition- 2009.
For Units 1, 2 and 5 Chapters 5, 6 and 7.
2. G. Andrew Duthie, Microsoft ASP .NET Programming with 　　Microsoft VISUAL C# . NET step by step , PHI private Limited, New Delhi – 2006. For Units 3 and 4 Chapter 11

Reference Books

1. Joe Wigglesworth and Paula McMillan, "Java Programming : Advanced Topics" Thomson Learning Inc -2007.
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, " Developing Java Web Services", Wiley Publishing Inc., 2004.
3. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
4. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers,2005.
5. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.

Course11UPCSC1E24   **J2EE   and J2ME**   4 Credits

UNIT I:
Understanding Java and the J2EE Platform   : Introduction – Application Components of J2EE – Model-View-Controller – J2EE APIs.   Java Mail: Protocols – Components – Java Mail API. Java Messaging Service: Introduction – Models – Components – Reliable Messaging - Message-Driven EJB. Java Transactions: Introduction – Local and Distributed Transactions – Consistency – Isolation – Durability – Transaction Models – Transaction Standards - Java Transaction API.

UNIT II:
EJB Architecture and Design: Introduction – Component Model – The Enterprise JavaBean – EJB Container Functionality – Integrating with CORBA . Session Beans and Business Logic – Stateless and Stateful Beans – Entity Beans – Message-Driven Beans.

UNIT III:
J2ME overview – Java 2 Micro Edition and the world of Java – Inside J2ME - J2ME and wireless devices – other Java platforms for small computing devices – Wireless technology – Radio Data Networks – Mobile Radio Networks – messaging –smart cards - J2ME Architecture and development environment - J2ME architecture – small computing device requirements – Run-time environment – MIDlet programming – Java language for J2ME - J2ME software development kits – Hello world J2ME style – Multiple MIDlets in a MIDlet suite - J2ME wireless toolkit - J2ME best practices and patterns – the reality of working in a J2ME world – best practice

UNIT IV:
Commands, items and event processing - J2ME user interfaces – display class – the palm OS emulator – command class – item class – exception handling - High level display: Screens – screen class – alert class – form class – item class – list class – text box class – ticker class – Low-level display: Canvas – The Canvas – User Interactions - Graphics – Clipping regions – animation - Record Management system – Record storage – writing and reading records – record enumeration – sorting records – searching records – record listener.

UNIT V:
Java Database Connectivity: Introduction – JDBC program – Savepoints – JDBC-ODBC Bridge DBProcessor. Web services – basics – J2EE mutli-ties web services architecture – client tier implementation – web tier implementation – Enterprise JavaBeans tier implementation – Enterprise Information systems tier implementation – inside WSDL - J2ME MIDlets and web services – Remote method invocation concept – SOAP basics – WSDL and SOAP – WSDL and HTTP Binding.

Text Books:
1. James McGovern et al., Fahim Adatia, Yakov Fain, "J2EE1.4 Bible",Wiley – dreamtech India Pvt. Ltd., 2003. (Chapters 1,8, 9 , 10 14, 15, 16, 17 ,18)
2. James Keogh, "J2ME: The Complete Reference", TMH, New Delhi, 2008. (Chapters: 1,2,3,4,5,6,7,8,9,11,14)

Reference Books:
1. Jim Keogh, "The Complete Reference – J2EE", Tata McGraw-Hill Edition 2002.
2. Herbert Schildt, "The Complete Reference – JAVA 2", Fourth Edition, 2001.
3. Deitel H.M. & Deitel P.J, "Java How to Program", Prentice-Hall of India, Fifth Edition, 2003.
4. Stephen Asbury, Scott R.Weiner "Enterprise JavaBeans – Developing component based Distributed Applications", Pearson Education, 1999.chapters(17,21,10)
5. Sing Li, Jonathan Knudsen, "Beginning J2ME: From novice to professions", Third edition, kindle edition, 2009
6. Jonathan Knudsen, "Wireless Java: Developing with J2ME" Second edition, Kindle edition, 2003.