THIRUVALLUVAR UNIVERSITY

CHOICE BASED CREDIT SYSTEM (CBCS)

Degree of Master of Computer Application (M.C.A)

(Effective from the Academic year 2008- 2009)

REGULATIONS

CBCS

Choice-Based Credit System is a flexible system of learning. 'Credit' defines the quantum of contents / syllabus prescribed for a course and determine the number of hours of instruction required. The distinguishing features of CBCS are the following:

It permits the students to:

- ✤ learn at their own pace
- Choose electives from a wide range of elective courses offered by the departments of the affiliated colleges
- undergo additional courses and acquire more than the required number of credits
- ✤ adopt an inter disciplinary approach in learning
- ✤ make best use of the expertise of available faculty

1. Conditions for Admission:

A Candidates who have passed the under mentioned degree examinations of this University or an examination of other institution by this University as equivalent thereto provided they have undergone the course under 10+2+3 or 11+1+3 or 11+2+2 pattern shall be eligible for admission to the M.C.A. Degree Course.

(a) B.C.A./B.E.S./B.Sc. in Computer Science/Mathematics/Physics/ Statistics / Applied Sciences OR (b) B.Com / Bachelor of Bank Management /B.B.A/B.L.M/B.A Corporate Secretary-ship / B.A. Economics/ any other Bachelor's Degree in any discipline with Business Mathematics and Statistics or Mathematics /Statistics in Main/Allied level or (c) B.Sc. Chemistry with Mathematics and Physics as allied Subjects or (d) B.E/B.Tech/M.B.A or (e) A Bachelor's Degree in any discipline with Mathematics as one of the subjects at the Higher Secondary level (i.e. in +2 level of the 10+2 pattern)

2. Eligibility for the Award of Degree:

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less

than three academic years and passed the examinations of all the Six Semesters prescribed earning 140 credits and fulfilled such conditions as have been prescribed therefor.

3. Duration of the Course:

The Course duration shall be three years consisting of three years consisting of Six semesters.

4. The Course of Study and the Scheme of Examinations

Year /	Subject	Paper	Title of the Paper				Max.Marks		
Semester				Ins. Hrs/ Week	Credit	Exam hrs	ΙA	Uni. Exam.	Total
l Year	Core	Paper I	Programming in C	5	4	3	25	75	100
I Semester	Core	Paper II	Digital logic and Computer Organization	5	4	3	25	75	100
	Core	Paper III	Principles of Information Technology	4	3	3	25	75	100
	Core	Paper IV	Data Structures	5	5	3	25	75	100
	Core	Paper V	Discrete Mathematics	5	4	3	25	75	100
	Core Practical	Practical I	C and Data Structures Lab	3	2	3	40	60	100
	Core Practical	Practical II	Office automation Lab (MS Word, Power Point, MS Access, Excel)	3	2	3	40	60	100
I Year II Semester	Core	Paper VI	Object Oriented Programming in C++	5	5	3	25	75	100
	Core	Paper VII	Design and Analysis of Algorithms	5	4	3	25	75	100
	Core	Paper VIII	Computer Graphics	5	5	3	25	75	100
		-	Human Rights	2	2	3	25	75	100
	Core	Paper IX	Accounting and Financial Management	5	4	3	25	75	100
	Core	Practical III	C++ and Algorithms Lab	4	2	3	40	60	100
	Core	Practical IV	Computer Graphics	4	2	3	40	60	100
ll Year	Core	Paper X	Operating Systems	5	5	3	25	75	100
III Semester	Core	Paper XI	Database Management Systems	5	5	3	25	75	100
	Core	Paper XII	Software Engineering	4	4	3	25	75	100
	Core Practical	Practical V	RDBMS (Oracle) Lab	4	2	3	40	60	100
	Core Practical	Practical VI	Operating Systems Lab	4	2	3	40	60	100
	Elective (a) or	Paper I	Soft Computing	4	3	3	25	75	100
	Elective (b)		Digital Image Processing						
	Elective (Non-Major subject)	Paper II	Web designing	4	3	3	25	75	100

Year /	Subject P	Paper Title of the Paper	Title of the Paper				Max.Marks		
Semester			lns. Hrs/ Week	Credit	Exam hrs	١٨	Uni. Exam.	Total	
II Year	Core	Paper XIII	Principles of Compiler Design	5	4	3	25	75	100
IV Semester	Core	Paper XIV	Programming in Java	5	4	3	25	75	100
	Core	Paper XV	Resource Management Techniques	5	5	3	25	75	100
	Core	Paper XVI	Visual Programming	5	4	3	25	75	100
	Core Practical	Practical VII	Java Lab	3	2	3	40	60	100
	Core Practical	Practical VIII	Visual Programming Lab	3	2	3	40	60	100
	Elective (a) or	Paper III	E-Commerce	4	3	3	25	75	100
	Elective (b)		Multimedia and its Applications						
III Year	Core	Paper XVII	Web Technology	5	4	3	25	75	100
V Semester	Core	Paper XVIII	Computer Networks	5	5	3	25	75	100
	Core	Paper XIX	C# Programming and .NET Framework	4	3	3	25	75	100
	Core	Paper XX	Data Mining and Warehousing	5	4	3	25	75	100
	Core Practical	Practical IX	Web Technology and .NET Lab	3	2	3	40	60	100
	Core Practical	Practical X	Mini Project	3	3	3	40	60	100
	Elective (a) or	Paper IV	Network Security	5	3	3	25	75	100
	Elective (b)		Enterprise Resources Planning						
III Year VI Semester			Project Work and <i>viva voce*</i>	30	20		50	150	200
			Total	180	140				3700

5. Structure of the Course and Evaluation Pattern:

The duration of University examination for theory and practical subjects shall be 3 hours. The maximum mark for each theory is 100 with 25 for conditions internal Assessment [CIA] and 75 for University Examination. The distribution of internal marks for theory papers shall be: Two tests out of three - 20 marks, and Assignment /Seminar -5 marks. The maximum marks for each practical is 100 with 40 for Internal Assessment and 60 for University Examination. The distribution of internal marks for practical papers shall be: Practical tests Two out of three - 10 marks, Attendance - 5 marks, and record - 5 marks. For project work the marks assigned shall be

Project Report	60 marks
Viva -Voce	20 marks

For the conduct of University Examinations in practical subjects the University will appoint one external examiner one internal examiner who shall normally be the concerned practical in-charge. The University will set the questions and distribute to the Colleges. The examiners will conduct the examinations and award the marks on the same day and forward to the University. The Principal /Head of the Department will coordinate and provide the laboratory and other facilities for conducting the examination.

Project work shall be carried out individually in an R&D section of any industry or University or in the Institute in which the candidate is studying. The project Work/Dissertation report shall be submitted through the guides /supervisors to the Head of the Department and then to the University not latter than 31st May /31st December. If He/She fails to submit the project Work/Dissertation within the stipulated date for particular semester, he/she may be permitted with the approval of the HOD to submit the project Work/Dissertation report during the succeeding Semesters, within the maximum period of Five years from the date of admission to the First Semester. project Work/Dissertation and Viva-voce shall be conducted by one external and one internal examiner who shall normally be the project guide.

6. Passing Requirements:

a) For all subjects the passing requirement is as follows: i) candidate secures not less than 50% of marks in University examination and not less than 50% in aggregate of the total maximum marks prescribed in each theory and practical, and in Project work minimum 50% each in dissertation and Viva-voce examination and not less than 50% aggregate of the total maximum marks prescribed, shall be declared to have passed in the respective subject.

7. Classification of successful candidates:

Candidates who secured not less than 60% of aggregate marks (Internal + External) in the whole examination shall be declared to have passed the examination in the First Class.

All other successful candidates shall be declared to have passed in Second Class. Candidates who obtain 75% of the marks in the aggregate (Internal + External) shall be deemed to have passed the examination in First Class with Distinction, provided they pass all the examinations (theory papers, practicals, project and Viva-voce) prescribed for the course in the First appearance.

8. Requirement to take the Examinations:

a) A candidate will be permitted to take the University Examination for any Semester, if

i) he / she secures not less than 75% of attendance out of the 90 instructional days during the Semester.

(In the case of married women students the minimum attendance requirement shall be 55% of the total instructional days).

ii) he / she earns a progress Certificate from the Head of the Institution of having satisfactorily completed the Course of Study prescribed in the subjects as required by the Regulations, and

iii) his / her conduct has been satisfactory.

Provided that it shall be open to the Syndicate or any authority delegated with such powers by the Syndicate to grant exemption to a candidate who has failed to earn 75% of the attendance prescribed for any valid reason(s) subject to the usual conditions.

b) A candidate who has secured attendance less than 75% but 65% and above shall be permitted to take the Examination on the recommendation of the Head of the Institution to condone the lack of attendance as well as on the payment of the prescribed fees to the University.

c) A candidate who has secured attendance less than 65% but 55% and above in any Semester, has to compensate the shortage of attendance in the subsequent Semester besides, earning the required percentage of attendance in that Semester and take the Examination of both the Semester papers together at the end of the latter Semester.

d) A candidate who has secured less than 55% of attendance in any Semester will not be permitted to take the regular Examinations. He / she has to re-do the Course after the completion of the final semesters by rejoining the Semester in which the attendance is less than 55%.

e) A candidate who has secured less than 65% of attendance in the final Semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the Course.

9. Grading System:

In addition to the above marking system, grading system is also adopted as detailed below:

(a) The marks (sum of IA and UE marks) in each course is assigned with a letter grade on a five point scale using the following letter grade, grade points and ranges of marks.

Marks	Grade Point	Letter Grade	Class
95-100	7.00	Н	First Class with Distinction
90-94	6.00	0	First Class with Distinction
75-89	5.50	D	First Class with Distinction

SEVEN POINT SCALE (As per UGC notification 1998)

60-74	4.75	А	First Class
55-59	4.00	В	Second Class
50-54	3.5	С	Second Class
Below 50	3.00	F	Fail

From the second semester onwards, the total performance within a semester and continuous performance starting from the first semester are indicated respectively by <u>Grade Point</u> <u>Average (GPA)</u> and <u>Cumulative Grade Point Average (CGPA)</u>. These two are calculated by the following formulae:

$$GPA = \frac{n}{\sum_{i=1}^{\Sigma} C_i G_i}{n}$$

$$\frac{n}{\sum_{i=1}^{\Sigma} C_i}{i=1}$$

Where ' G_i ' is the Credit earned for the Course i in any semester; ' G_i ' is the Grade point obtained by the student for the course i and 'n' is the number of courses <u>passed</u> in that semester.

CGPA = GPA of all the courses starting from the first semester to the last semester.

10. Ranking:

Candidates who pass all the examinations prescribed for the course in the first appearance itself alone are eligible for Ranking / Distinction.

Provided in the case of Candidates who pass all the examinations prescribed for the course with a break in the First Appearance due to the reasons as furnished in the Regulations 7. (iii) supra are only eligible for Classification / Distinction,

11. The Medium of Instruction and Examinations

The medium of instruction and Examinations shall be in English.

12. Submission of Record Notebooks for Practical Examinations

Candidates taking the Practical Examinations should submit bonafide Record Note Books prescribed for the Practical Examinations. Otherwise the candidates will not be permitted to take the Practical Examinations. However, in genuine cases where the students could not submit the record note books may be permitted to take the Practical Examinations provided the Head of the Department concerned from the institution certifies that the candidate has

performed the experiments prescribed for the Course. For such candidates who do not submit Record Note Books, zero (o) marks will be awarded for record note books.

13. Improvement of Marks in the subjects already passed

Candidates who have passed in theory paper / papers are allowed to appear again for theory paper / papers only once in order to improve his/her marks, by paying the fee prescribed from time to time. Such Candidates are allowed to improve within a maximum period of 6 Semesters counting from his/her first semester of his/her admission. If candidate improves his marks, then his improved marks will be taken into consideration for the award of Classification only. Such improved marks will not be counted for the award of Prizes / Medals, Rank and Distinction. If the Candidate does not show improvement in the marks, his previous marks will be taken into consideration.

No candidate will be allowed to improve marks in the Practicals, Mini Project, Viva-voce, Field work.

14. Evening College

The above Regulations shall be applicable for candidates undergoing the respective Courses in the Evening Colleges also.

15. Transitory Provision:

Candidates who have undergone the course of study prior to the academic year 2008-2009 will be permitted to appear for the examinations under those Regulations for a period of three years i.e., upto and inclusive of April/May 2012 Examinations. Thereafter, they will be permitted to appear for the examination only under the Regulations then in force.

THIRUVALLUVAR UNIVERSITY

MASTER OF COMPUTER APPLICATION

SYLLABUS

UNDER CBCS

(with effect from 2008-2009)

I SEMESTER

PAPER I

PROGRAMMING IN C

UNIT-I

C language fundamentals: Program structure-identifiers-data types - integer - float - double-char - constants-variables-operators and expressions-managing input and output operations

UNIT-II

C control structures: Decision making with IF statement - IF...ELSE statement - nested IF statement - FOR statement-DO...WHILE statement - WHILE...DO statement - GOTO statement - SWITCH statement.

UNIT-III

C functions: Mathematical functions-string functions - user defined functions.

UNIT-IV

Array: Arrays - passing arrays to a function Structure: Definitions - assigning structure variable-assigning initial values - structures and functions-union.

UNIT-V

Pointers and file operations: Understanding pointers - pointers and functions - understanding files - I/O functions - formatted I/O - working with structures - reading and writing disk files.

Text Books

- 1. Balagurusamy E, "Programming in ANSI C", 3/E, TMG, 2007.
- 2. Rajaraman V,"Programming in C", PHI, 1996.

- 1. B.W.Kernighan and D.M.Ritchie," The C Programming Language: ANSI C version ", Second Edition ,PHI/Pearson Education Pvt. Ltd.
- 2. B.S.Gottfried,"Programming with C",2/e,SchaumOutline Series, TMH,2005.
- 3. Somashekara , "Programming in C", PHI, 2006.

PAPER II

DIGITAL LOGIC AND COMPUTER ORGANIZATION

UNIT-I

Number System - converting numbers from one base to another - Complements -Binary codes - Integrated Circuits - Boolean algebra - properties of Boolean algebra -Boolean functions - Canonical and Standard forms - Logic operations - Logic gates -Karnaugh Map up to 6 variables - Don't care condition - Sum of products and Products of Sum simplification - Tabulation Method.

UNIT-II

Adder - Subtractor - code converter - Analyzing a combinations Circuit - Multilevel NAND and NOR circuits - properties of XOR and equivalence function - Binary parallel Adder - Decimal Adder - Magnitude Comparator - Decoders - Multiplexers - ROM - PLA.

UNIT-III

Flip flops - Triggering of flip-flops - Analyzing a sequential circuit - State reduction - Excitation tables - Design of sequential circuits - Counters - Design with state equation - registers - Shift Registers - Ripple and Synchronous Counters.

UNIT-IV

Memory Unit - Bus Organization - Scratch Pad Memory - ALU - Design of ALU - Status Register - Effects of Output carry - Design of shifter - Processor Unit - Microprogramming - Design of Specific Arithmetic Circuits.

UNIT-V

Accumulator - Design of Accumulator - Computer configuration - Instructions and Data formats - Instruction sets - Timing and Control - Execution of Instruction -Design of Computer - H/W control - PLA Control and Micro program Control.

Text Book

M. Morris Mano - Digital logic and computer design PHI – 1994

- 1. M.M.Mano and C.R. Kime, Logic and Computer fundamentals, 2nd Edition Pearson Education, 2001.
- 2. Thomas C.Barteei, "Digital Computer Fundamentals ", 6/e, Tata McGrawHill.
- 3. Rajaraman V and Radhakrishnan, "Digital logic and Computer Organization", PHI, 2007.

PAPER III

PRINCIPLES OF INFORMATION TECHNOLOGY

UNIT-I

Computer Basics: Evolution - Generations - Classifications-Components- Applications of Computers - Central Processing Unit - Instruction Format, Instruction Cycle, Instruction Set - Data Representation - Coding Schemes -Memory Hierarchy - Random Access Memory (RAM) - Read Only Memory (ROM) - Types of Secondary Storage Devices-Types of Input and Output Devices.

UNIT-II

Software: Introduction - Categories - Installing and Uninstalling - Piracy - Terminologies. Operating Systems: Evolution - Types and Functions of Operating Systems. Basics of Microsoft Windows and Unix Operating Systems.

UNIT-III

Microsoft Word 2000: Introduction - Working with Word 2000 - Checking Spelling and Grammar - Adding Graphics - Printing.

Microsoft Excel 2000: Introduction - Working with Excel 2000 - Formulas and Functions - Inserting Charts - Printing.

PowerPoint 2000: Introduction - Working with PowerPoint 2000 - Designing Presentation - Printing.

UNIT-IV

Data Communication and Computer Networks: Introduction - Data Communication -Transmission Media - Modulation - Multiplexing - Switching - Computer Network -Network Topologies - Communication Protocol - Network Devices.

Internet: Introduction - Evolution - Connect to Internet - Internet Applications - Data over Internet.

Internet Tools: Introduction - Web Browser - Browsing Internet Using Internet Explorer - Electronic Mail (E-Mail) - Search Engines - Instant Massaging.

Computer Security: Introduction - Computer Security: Definition - Malicious Programs - Cryptography - Digital Signature - Firewall - Users Identification and Authentication - Security Awareness and Policies.

UNIT-V

Database Fundamentals: Introduction - Logical and Physical Data Concepts - Database Management System (DBMS) - DBMS Architecture - Database Models - Normalization - Types of Databases - Data Warehousing and Data Mining.

Structured Query Languages (SQL): Introduction - DDL and DML Commands - Querying Multiple Table - Nesting Select Statements.

Database Management with Microsoft Access 2000: Introduction - Starting Access - Tables - Queries - Forms - Reports.

Text Books

- 1. Introduction to Information Technology, ITL Education Solutions Ltd., Pearson Education, 2007.
- 2. Rajaraman V,"Introduction to Information technology",PHI,2005.
- 3. Sumitabha Das, Unix: Concepts and Applications, Fourth Edition, Tata McGraw Hill, 2006.

- 1. Dennis P. Curtin, Kim Foley, Kunal Sen, Cathieen Morin, "Information Technology", TMG, 2006.
- 2. ISRD Group, "Basics of OS UNIX and shell Programming", TMG, 2007.

PAPER IV

DATA STRUCTURES

UNIT-I

Introduction to Data Structures - Overview - Types - Primitive and Non-Primitive Data Structures and Operations. Arrays - Types - Strings - Array of Structures - Sparse and Dense Matrices - Row - Major and Column - Major Arrays - Pointers and Arrays - Array of Pointers - Pointers and Strings. Recursion - Types - Rules - Recursion Vs. Iterations - Towers of Hanoi - Advantages and Disadvantages.

UNIT-II

Stacks - Operations - Pointers and Stack - Representation of Arithmetic Expressions -Infix, Prefix and Postfix Notations - Evaluation of Postfix Expression - Conversion of Expression - Applications. Queues - Operations - Disadvantages - Implementation -Types and Applications.

UNIT-III

List - Operations - Linked List - Memory Allocation and De-Allocation - Operations - Singly Linked List - Linked List with and without Header - Operations - Circular Linked List - Doubly Linked List - Circular Doubly Linked List - Applications. Storage Management - Allocation Techniques - Storage Allocations - Storage Release - Compaction - Garbage Collections.

UNIT-IV

Trees - Terms - Binary Trees - Types - Representation - Operation and Traversal -Conversion of Expression - Binary Search Tree - Threaded Binary Tree - B-Tree - B+ Tree. Graph - Terminologies - Representation - Traversal - Spanning Trees.

UNIT-V

Sorting - Methods : Insertion - Selection - Bubble - Quick - Tree - Merging List - Heap - Radix - Partition Exchange. Searching - Linear and Binary Search - Hashing Method - Hashing Function - Division - Mid-Square - Folding - Length - Dependent - Digit Analysis Methods.

Text Books

- 1. Ashok N Kamthane, "Introduction to Data Structures in C", Pearson Education (S) Pte. Ltd., New Delhi : 2005.
- 2. Samanta D,"Classic Data Structures",PHI,2003.

- 1. Jean-Paul Tremblay and Paul G Sorenson, "An Introduction to Data Structures with Applications", Second Edition, Tata McGraw-Hill Publishing Company Lt., New Delhi : 1995.
- 2. ISRD Group, "Data structures using C", TMG, 2007.

PAPER V

DISCRETE MATHEMATICS

UNIT-I

Matrices : Introduction - Matrix operations - Inverse of a Square Martix - Elementary Operations and Rank of a Matrix - Simultaneous Equations - Inverse by Partitioning - Eigen Values and Eigen Vectors.

UNIT-II

Set Theory : Introduction - Sets - Notations and Description of Sets - Subsets - Venn-Diagram - Operations on Sets - Properties of Set Operations - Verification of the Basic Laws of Algebra by Venn Diagrams - The Principles of Duality - Relations: Cartesian Product of Two sets - Relations - Representation of a Relation - Operations on Relations - Equivalence Relation - Closure and Warshall's algorithm - Partitions and Equivalence Classes - Functions: Function and Operators - One-to-one, Onto Functions - Special Types of Functions - Invertible Functions - Composition of Functions.

UNIT-III

Logic : Introduction - TF Statements - Connectives - Atomic and Compound Statements - Well Formed Formulae - Truth Table of a Formula - Tautology -Tautology Implications and Equivalence of Formulae - Replacement Process -Functionally Complete Sets of Connectives and Duality Law - Normal Forms -Principles of Normal Forms - Theory of Inference - Open Statements - Quantifiers -Valid Formulae and Equivalence - Theory of Inference for Predicate Calculus -Statements involving more than one Quantifier.

UNIT-IV

Finite Automata - Definition of Finite Automation - Representation of Finite Automaton - Acceptability of a String by Non-Deterministic Finite Automata - Equivalence of FA and NFA - Procedure for finding an FA equivalent to a given NFA - Properties of Regular Sets - Finite State Machines - The monoid of a Finite State Machine - The Machine of a Monoid - Phrase Structured Grammars.

UNIT-V

Chomsky Hierarchy of Languages - Finite Automata and Regular Languages - Derivation Trees for Context-free Grammars - Normal Forms for Context-free Grammars - Ambiguity, Polish Notation - Simple Precedence Grammar - Pushdown Automation - Instantaneous Description of a PDA - Important Properties of Move Relation - Acceptance by PDA - Equivalence of two types of a Acceptance by PDA - Context-free Languages and PDAs - Turing Machines - The Language accepted by a TM - Turing Machine as a Computer Integer Functions - Techniques for Turing Machine Construction.

Text Books

1. Discrete Mathematics - Venkatraman M K, Sridharan N, Chandrasekaran N, The National Publishing Company, Chennai, 2000.

2. Somasundaram RM," Discreate Mathematical Structures",PHI,2003.

- 1. Introduction to Automata Theory, Languages & Computation, Hopcraft and Ullman, 2nd Edition, Pearson Education.
- 2. Discrete Mathematical structures with applications to computer science, Tremblay and Manohar, Tata McGraw Hill.
- 3. Discrete Mathematical Structures with Applications to Combinatorics, Ramaswamy V, University Press, 2006.
- 4. Veerarajan T, "Discrete mathematics with graph theory and combinatorics", TMG, 2007

CORE PRACTICAL I

C AND DATA STRUCTURES LAB

- 1. Implementation of arrays
- 2. Singly linked list
- 3. Circular linked list
- 4. Implementation of stacks
- 5. Implementation of queues
- 6. Implementation of circular queue.
- 7. Evaluation of expressions
- 8. Binary tree traversal
- 9. Binary search tree
- 10. Shortest path (Dijkstra)

CORE PRACTICAL II

OFFICE AUTOMATION LAB (MS WORD, POWERPOINT, MS ACCESS, EXCEL)

- 1. Creation of New document with various format options
- 2. Creation of Document with Table and their manipulations
- 3. Creation of Document with Mail Merge options
- 4. Creation of Slides with varying Slide Transitions
- 5. Creation of Slides with Pictures and their groupings
- 6. Create a worksheet with various Mathematical functions
- 7. Create a worksheet with various Financial Functions
- 8. Draw suitable Charts for the data
- 9. Create a database with forms and reports for Student data
- 10. Create a database with forms and reports for an Employee data
- 11. Database Manipulations for student and employee data
- 12. Use of import and Export options in Database Manipulations

II SEMESTER

PAPER VI

OBJECT ORIENTED PROGRAMMING IN C++

UNIT-I

Introduction to OOP: Overview of C++-classes-structures-union-friend functionfriend class-inline function-constructors-static members-scope resolution operatorpassing objects to functions-function returning objects

UNIT-II

Arrays-pointers-this pointer-references-dynamic memory allocation-functions overloading-default arguments-overloading constructors-pointers to functions

UNIT-III

Operator overloading-member operator function-friend operator function-type conversion-inheritance-types of inheritance-virtual base class-polymorphism-virtual function.

UNIT-IV

Class templates and generic classes-function templates and generic functionsoverloading a function templates-power of templates-exception handling-derived class exception-exception handling functions

UNIT-V

Streams-formatted I/O with its class functions and manipulators-creating own manipulators-file I/O-conversion functions-standard template library.

Text Book

Balagurusamy E, "Object Oriented Programming with C++", 3/E, TMG, 2006.

- 1. Hubbard ,"Programming with C++", 2/e, Schaum Outline Series,TMH, 2006.
- 2. Bjarne Stroustrup, "The C++ Programming Language", Addison Wesley Publications, Second Edition, 1991.
- 3. Sarang Proonachandra,"Object Oriented Programming with C++",PHI, 2006.
- 4. Jagadev A K,Rath A M, and Dehuri S,"Object Oriented Programming Using C++",PHI, 2007.

PAPER VII

DESIGN AND ANALYSIS OF ALGORITHMS

UNIT-I

Introduction - Algorithm - Specification - Performance Analysis - Divide - And Conquer - General Method - Binary Search - Finding the Maximum and Minimum -Merge Sort - Quick Sort.

UNIT-II

The Greedy Method - General Method - Knapsack Problem - Tree Vertex Splitting Dynamic Programming - General Method - Multistage Graphs - All pairs shortest paths - Single - Source Shortest paths - The traveling salesperson problem - Flow shop scheduling.

UNIT-III

Basic Traversal and Search Techniques - Binary Trees - Graphs - Connected Components and Spanning Trees - Biconnected Components.

UNIT-IV

Backtracking - General Method - 8 Queens Problem - Graph Coloring - Branch and Bound - Method - 0/1 Knapsack Problem

UNIT-V

NP-Hard and NP-Complete Problem - Basic Concepts - Cooke's Theorem - NP-Hard Problems - Clique Decision Problem - Job Shop Scheduling - Code generation with Common Sub expressions - Approximation Algorithms - Introduction - Absolute Approximations - E-Approximations

Text Book

Ellis Horowitz, Sartaj Sahni and Sanguthevar Rajasekaran, "Computer Algorithms", Galgotia Publications Pvt. Ltd., 2002

- 1. Sara Baase and Allen Van Gelde, "Computer Algorithms, Introduction to Design and Analysis", 3rd Edition, Pearson Education, Delhi, 2002.
- 2. Aho, Hoporoft and Ullman, "The Design and Analysis of Computer Algorithm", Pearson Education, Delhi, 2001.
- 3. Basu S.K.,"Design Methods and Analysis of Algorithms", PHI, 2006.
- 4. Brassad and Bratley,"Fundamentals of Algorithms", PHI, 1995.
- 5. Sanjoy Dasgupta, Christos Papadimitriou, Umesh vazirani, "Algorithms", TMG, 2007.

PAPER VIII

COMPUTER GRAPHICS

UNIT-I

Video Display devices - Raster scan systems - Input devices - Hard copy devices - Graphics software - Output primitives - Attributes of output primitives.

UNIT-II

Two - Dimensional Transformation - Clipping - Window - View port mapping.

UNIT-III

User dialogue - Input of Graphical Data - Input functions - Input device parameters - Picture construction Techniques - Virtual Reality Environments.

UNIT-IV

Three Dimensional concepts - 3D Transformations -3D Viewing.

UNIT-V

Visible - Surface Detection : Back - Face Detection - Depth - Buffer method - Scan Line Method - A Buffer method - Properties of Light - Infinitive color concepts -RBG color Models - Computer Animation.

Text Book

D.Hearn and M.P.Baker-Computer Graphics-Second Edition-PHI-1996.

- 1. W.M.Neuma and R.F.Sproull-Priciple of Interactive computer Graphics-McGraw Hill 1979.
- 2. Foley, Van Dan, Feiner, Hughes-Computer Graphics-Addison Wesley-2000.
- 3. ISRD Group "Computer Graphics", TMG, 2006.

PAPER IX

ACCOUNTING AND FINANCIAL MANAGEMENT

UNIT-I

Financial Accounting: Meaning and Scope of Accounting - Principles - Concepts -Conventions - Accounting Standards - Final Accounts - Trail Balance - Trading Account-Profit and Loss Account - Balance Sheet - Accounting Ratio Analysis -Funds Flow Analysis - Cash Flow Analysis

UNIT-II

Accounting: Meaning-Objectives-Elements of Cost - Cost Sheet - Marginal Costing and Cost Volume Profit Analysis-Break Even Analysis - Applications - Limitations - Standard Costing and Variance Analysis - Material - Labor - Overhead-Sales-Profit Variances.

UNIT-III

Budgets And Budgeting Control: Budgets and Budgetary Control – Meaning - Types-Sales Budget - Production Budget - Cost of Production Budget - Flexible Budgeting -Cash Budget - Master Budget - Zero Base Budgeting - Computerized Accounting

UNIT-IV

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Investment Decision and Cost of Capital: Objectives and Functions of Financial Management - Risk - Return Relationship - Time Value of Money Concepts - Capital Budgeting - Methods of Appraisal - Cost of Capital Factors Affecting Cost of Capital - Computation for Each Source of Finance and Weighted Average Cost of Capital.

UNIT-V

Financing Decision and Working Capital Management: Capital Structure - Factors Affecting Capital Structure - Dividend Policy - Types of Dividend Policy - Concepts of Working Capital - Working Capital Policies - Factors affecting Working Capital - Estimation of Working Capital Requirements.

Text Book

- 1. S.N.Maheswari, Financial and Management Accounting, Sultan Chand & Sons, 2003
- 2. I.M.Pandey, Financial Management, Vikas Publications, 4th Reprint, 2002

- 1. Cost and Management Accounting, S.P.Iyengar, Sultan Chand & Co,
- 2. Elements of Management Accounting, I.M.Pandey, Vikas Publishing House, 19993.
- 3. Bose Chandra,"Fundamentals of Financial Management",PHI,2007.
- 4. Ramachandra Aryasri A, Ramana Murthy, "Engineeering economics and financial accounting", TMG, 2006.

HUMAN RIGHTS COMPULSORY PAPER

UNIT-I

Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights - Historical Development of Human Rights.

UNIT-II

International Human Rights - Prescription and Enforcement upto World War II -Human Rights and the U .N .O. - Universal Declaration of Human Rights -International Covenant on Civil and Political Rights - International Convenant on Economic, Social and Cultural Rights and Optional Protocol.

UNIT-III

Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner.

UNIT-IV

Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts.

UNIT-V

Contemporary Issues on Human Rights: Children's Rights - Women's Rights - Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment.

Fundamental Rights in the Indian Constitution - Directive Principles of State Policy -Fundamental Duties - National Human Rights Commission.

Books for Reference:

- 1. International Bill of Human Rights, Amnesty International Publication, 1988.
- 2. Human Rights, Questions and Answers, UNESCO, 1982
- 3. Mausice Cranston
- What is Human Rights 4. Desai, A.R.
- 5. Pandey

- Violation of Democratic Rights in India - Constitutional Law.
- Working for Justice and Human Rights. 6. Timm, R.W.

- 7. Human Rights, A Selected Bibliography, USIS.
- 8. J.C.Johari Human Rights and New World Order.
- 9. G.S. Bajwa Human Rights in India.
- 10. Amnesty International, Human Rights in India.
- 11. P.C.Sinha &
 - International Encyclopedia of Peace, Security
 - K. Cheous (Ed) Social Justice and Human Rights (Vols 1-7).
- 12. Devasia, V.V. Human Rights and Victimology.

Magazines:

- 1. The Lawyer, Bombay
- 2. Human Rights Today, Columbia University
- 3. International Instruments of Human Rights, UN Publication
- 4. Human Rights Quarterly, John Hopkins University, U.S.A.

CORE PRACTICAL III

C++ AND ALGORITHMS LAB

- 1. Classes and objects
- 2. Function overloading
- 3. Constructors
- 4. Friend function
- 5. Inline function
- 6. Operator overloading
- 7. Conversion function
- 8. Inheritance
- 9. Polymorphism
- 10. Files
- 11. Sorting algorithms.
- a. selection sort.
- b. Straight insertion.
- c. Heap sort
- d. Quick sort
- 12. Searching:
- a. Binary search
- b. Linear search.

CORE PRACTICAL IV

COMPUTER GRAPHICS LAB

- 1. Develop a Program for 2D Translation
- 2. Develop a Program for 2D Scaling
- 3. Develop a Program for 2D Rotation
- 4. Develop a Program for 3D Translation
- 5. Develop a Program for 3D Scaling
- 6. Develop a Program for 3D Rotation
- 7. Draw a line using Line Drawing Algorithms
- 8. Draw a circle using Circle Drawing Algorithms
- 9. Draw a Ellipse Using Breshenham Algorithm
- 10. Develop a Program using Graphics Primitives
- 11. Develop a Program for Line Clipping
- 12. Develop a Program for Window to View port

III SEMESTER

PAPER X

OPERATING SYSTEMS

UNIT-I

Introduction: Definition of OS - early History - history of DOS and UNIX operating system Process: Definition of process-process states-process state transition - interrupt processing-interrupt classes - context switching - semaphores - deadlock and definite postponement.

UNIT-II

Storage management: Real storage management strategies - contiguous versus non - contiguous storage allocation - single user contiguous storage allocation - fixed partition multiprogramming - variable partition multiprogramming - multiprogramming with storage swapping. Virtual storage: Virtual storage management strategies - page replacement strategies - working sets - demand paging - paging sets.

UNIT-III

Processor management: Preemptive versus non-preemptive scheduling-priorities - deadline scheduling - FIFO - RR - Quantum size - SJF-SRT-SHN. Distributed computing: Classification of sequential and parallel processing-array processors - dataflow computers - multiprocessing - fault tolerance.

UNIT-IV

Device and information management: Operation of moving head disk storage-need for disk scheduling-seek optimization-FCFS-SSTF-SCAN-RAM disks-optical disks. Files and database systems: File system-function-organization-allocating and freeing space-file descriptor-access control matrix.

UNIT-V

Case studies: DOS - memory management - overlaying - extended and expanded memory - memory allocation - file system and allocation method - internal and external command memory management functions-file management functions. UNIX: Process in UNIX - memory management - I/O systems-file systems and allocation method - semaphores - command systems.

Text Book

H.M.Deital, "An introduction to operating systems", Addison wisely, second edition,1998.

- 1. Willam Stallings, "Operating Systems", 5/e PHI/Pearson Education,1997.
- 2. Silberschatz, Peterson, Galvin, "Operating System Concepts", Addisson Wessely, Fifth Edition, 1998.
- 3. Charles Crowley, "Operating systems A Design Oriented Approach", Tata McGraw Hill, 1998.
- 4. Andrew S. Tannenbaum, " Operating Systems: Design and Implementation", 3/e, PHI, 2006.

PAPER XI

DATABASE MANAGEMENT SYSTEMS

UNIT-I

Basic Concepts - Definitions - Data Dictionary - Data Base System - DBA - Data Base Languages - Data Base System Architecture : Schemas, Sub-Schemas and Instances - Three-Level Architecture - Data Independence - Mappings - Data Models - Types - ER Model - Relational Algebra - Relational Calculus.

UNIT-II

Relational Query Languages: Introduction - Codd's Rules - Information System Based Language - Structured Query Language (SQL) - Embedded SQL.

UNIT-III

Normalization: Introduction to Data Base Design - Functional Dependency - Decomposition - Normalization - Normal Forms - BCNF - Multi-valued and Join Dependencies.

UNIT-IV

Transaction Processing and Concurrency Processing: Transaction Concepts -Concurrency Control - Locking Methods - Timestamp Methods - Optimistic Methods for Concurrency Control - Data Base Recovery System - Recovery Concepts - Types - Recovery Techniques - Buffer Management - Data Base Security - Goals -Firewalls - Data Encryption.

UNIT-V

Parallel Data Base System: Introduction - Architecture - Key Elements - Query Parallelism - Deduction Data Base System - Distributed Data Bases - Distributed Query Processing - Concurrency Control and Recovery Control in Distributed Data Bases.

Text Book

S.K.Singh,"Database Systems Concepts, Design and Applications", Peasrson Education Pte Ltd., 2006

- 1. Abraham Silberschatz, "Database Systems", McGraw Hill International, 1997.
- 2. C. J. Date, "An Introduction to Database Systems", Sixth Edition, Addition-Wesley Publishing Company, New York : 1995.
- 3. Paneerselvam R, "Database Management Systems", PHI,2005.
- 4. Narang Rajesh, "Database Management Systems", PHI,2005.
- 5. ISRD Group, "Introduction to Database Management Systems", TMG, 2006.
- 6. Ramakrishnan, Gehrke, "Database Management Systems", 3/E, TMG, 2003.

PAPER XII

SOFTWARE ENGINEERING

UNIT-I

Introduction - Evolving Role of Software - Changing Nature of Software - Software Myths. A Generic View of Process : Layered Technology - Process Models : Waterfall Model - Evolutionary Process Models. Software Engineering : Computer Based Systems - The System Engineering Hierarchy.

UNIT-II

Requirements Engineering: Tasks - Initiating the Requirements Engineering Process - Eliciting Requirements - Building the Analysis Model - Requirements Analysis - Data Modeling Concepts - Flow Oriented Modeling - Class Based Modeling - Creating a Behavioral Model.

UNIT-III

Data Engineering: Design Process and Design Quality - Design Concepts - The Design Model. Creating an Architectural Design : Software Architecture - Data Design - Architectural Design - Mapping Data Flow into Software Architecture. Performing User Interface Design : Golden Rules - User Interface Analysis and Design - Interface Analysis - Interface Design Steps - Design Evaluation.

UNIT-IV

Testing Strategies : Strategic Approach to Software Testing - Test Strategies for Conventional and Object Oriented Software - Validation Testing - System Testing -Art of Debugging . Testing Tactics : Fundamentals - White Box - Basis Path -Control Structure - Black Box Testing Methods - Object Oriented Testing Methods.

UNIT-V

Project Management: Management Spectrum - People - Product - Process - Project. Estimation: Project Planning Process - Resources - Software Project Estimation -Decomposition Techniques - Empirical Estimation Models. Project Scheduling: Project Scheduling - Scheduling. Quality Management: Quality Concepts - Software Quality Assurance - Formal Technical Reviews.

Text Book

Roges S Pressman, "Software Engineering A Practitioner's Approach", Sixth Edition, McGraw Hill International Edition, New York : 2005.

- 1. Ian Somerville, "Software Engineering", Seventh Edition, Pearson Education Pvt. Ltd., New Delhi : 2006.
- 2. Mall Rajib, "Software Engineering",2/E,PHI, 2006.

CORE PRACTICAL V RDBMS (ORACLE) LAB

SQL

- 1. Simple Queries using DDL, DML and DCL
- 2. SQL Aggregate Functions
- 3. SET Operations
- 4. Views and Snapshots
- 5. Multiple Tables and Nested Queries

PL/SQL

- 6. PL/SQL Block
- 7. Function and Procedures
- 8. Subprograms and Packages
- 9. Triggers
- 10. Cursors

FORMS AND REPORTS

- 11. Designing Oracle Forms using Menus and Buttons
- 12. Developing Oracle Reports

CORE PRACTICAL VI

OPERATING SYSTEMS LAB

- 1. Process Scheduling
- 2. Process Synchronization
- 3. Deadlock Algorithms
- 4. Page Replacement Algorithms
- 5. Simulation of Paging and Segmentations
- 6. Consumer Problem
- 7. Unix Shell Programming
- a. Menu Creation.
- b. Fibonacci Series
- c. Sum of digits
- d. Grep Command
- e. Counting chars, Words, Lines
- f. Palindrome
- g. Prime number

ELECTIVE

PAPER I

(To choose either A or B)

A) Soft Computing

UNIT-I

Introduction To Soft Computing And Neural Networks - Evolution of Computing -Soft Computing Constituents - From Conventional AI to Computational Intelligence -Adaptive Networks - Feed forward Networks - Supervised Learning Neural Networks - Radia Basis Function Networks - Reinforcement Learning - Unsupervised Learning Neural Networks - Adaptive Resonance architectures.

UNIT-II

Fuzzy Sets And Fuzzy Logic Fuzzy Sets - Operations on Fuzzy Sets - Fuzzy Relations - Fuzzy Rules and Fuzzy Reasoning - Fuzzy Inference Systems - Fuzzy Logic - Fuzzy Expert Systems - Fuzzy Decision Making.

UNIT-III

Neuro-Fuzzy Modeling - Adaptive Neuro-Fuzzy Inference Systems - Coactive Neuro-Fuzzy Modeling - Classification and Regression Trees - Data Clustering Algorithms - Rulebase Structure Identification - Neuro-Fuzzy Control.

UNIT-IV

Machine Learning - Machine Learning Techniques - Machine Learning Using Neural Nets - Genetic Algorithms (GA) - Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT-V

Support Vector Machines - Support Vector Machines for Learning - Linear Learning Machines - Support Vector Classification - Support Vector Regression - Applications.

Text Books:

- 1. Jyh-Shing Roger Jang, Chuen-Tsai Sun, Eiji Mizutani, "Neuro-Fuzzy and Soft Computing", Prentice-Hall of India, 2003.
- 2. James A. Freeman and David M. Skapura, "Neural Networks Algorithms, Applications, and Programming Techniques", Pearson Edn., 2003.

References:

- 1. George J. Klir and Bo Yuan, "Fuzzy Sets and Fuzzy Logic-Theory and Applications", Prentice Hall, 1995.
- 2. Amit Konar, "Artificial Intelligence and Soft Computing", First Edition,CRC Press, 2000.
- 3. Simon Haykin, "Neural Networks: A Comprehensive Foundation", Second Edition Prentice Hall, 1999.
- 4. Mitchell Melanie, "An Introduction to Genetic Algorithm", Prentice Hall, 1998.
- 5. David E. Goldberg, "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, 1997.
- 6. Fakh Redine, Kar Larfare, Soft Computing and Intelligent System Design Theory, Tools and Applications, Pearson, 2009.

B) DIGITAL IMAGE PROCESSING

UNIT-I

Introduction: Digital image Representation, Fundamental steps in Image processing, Elements of Digital Image processing systems.

Digital Image Fundamentals: Elements of Visual Perception, Sampling and Quantisation, Basic Relationships between Pixels.

UNIT-II

Image Transformation and Enhancement: Image transforms and their properties-Fourier transform, Discrete Fourier transform, Fast Fourier transform, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar, Slant, Hotelling Transforms.

Image Enhancement-Spatial Domain, Frequency Domain methods, Enhancement by point processing, Spatial Filtering.

UNIT-III

Image Compression - Redundancy, fidelity Criteria, Image Compression models, Elements of Information Theory, Error-Free Compression, Lossy Compression, Image file formats.

UNIT-IV

Image Segmentation: Image Segmentation - Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region-Oriented Segmentation.

UNIT-V

Image Representation: Image Representation and Description - Representation schemes, Boundary Descriptors, Regional descriptors, Morphology.

Text book

Rafael C. Gonzalez, Richard E.Woods, Digital Image Processing, PHI/Pearson Education, 1998.

- 1. Anil K.Jain, Fundamentals of Digital Image Processing, PHI, 1995
- 2. Sid Ahmed, "Image Processing", McGrawHill, 1994.
- 3. Chanda B, and Dutta Majumdar D,"Digital Image Processing and Analysis", PHI, 2000.

ELECTIVE PAPER II

(NON-MAJOR SUBJECT)

WEB DESIGNING

UNIT-I

Introduction: Internet Principles - Basic Web Concepts - Client/Server model - Retrieving data from Internet - HTML and Scripting Languages - Standard Generalized Mark-up Language - Next Generation Internet - Protocols and applications. Introduction to How Web Advertising Works, Banner Ads - Sidebar Ads - Varied Shapes and Sizes - PopUp and PopUnder - Floating Ads.

UNIT-II

Enterprise Application development environment: Web servers - Server Administration - IDL - Database Connectivity - Web Application architecture - Distributed Web Applications - Remote method Invocation - Web Customization - Mark Up Languages.

UNIT-III

Scripting Languages: HTML - DHTML - XHTML - XML - JavaScript - Perl - CGI - PHP - ColdFusion.

UNIT-IV

Business and the Marketing Concept : How to Make a Web Page - Elements of Good Web Site Design - Starting a Business Online - Server Services - Domain Names - Web Oriented Industries. Online Marketing - Email Marketing - Search Engine Marketing - Banner Ad Placement - Link Exchange.

UNIT V

Real Time Applications: Shopping Cart - Home Banking Applications - Design and Implementation - Fire Wall - Business models - Tools usage.

Reference Books

- 1. Themas A. Powell, The Complete Reference Web Design, Tata McGraw Hill, Third Edition, 2003.
- 2. H. M. Deitel, P. J. Deitel, A. B. Goldberg, Internet and World Wide Web How to Program, Third Edition, Pearson Education 2004.
- 3. Ashley Friedlein, Web Project Management, Morgan Kaufmann Publishers, 2001.
- 4. Ed Roman, Mastering EJB and the Java 2 Platform Enterprise edition, John Wiley and Sons.
- 5. Stepehen Aubury, Scott R.Weiner, Developing Java Enterprise Applications, Wiley Computer publishing, 2001.
- 6. Achyat Godbole and Atul Kahate, "Web Technologies", TCP / IP to Internet Application's Architecture", Tata McGraw Hill, 2006.
- 7. Rickard Oberg, Mastering RMI: Developing Enterprise Applications in Java and EJB, John Wiley and Sons, Book and CDROM edition 2001.
- 8. Harold, Elliote Rusty Harold, XML Bible, 2nd Edition Hungry Minds, Inc.
- 9. Paul Wilton, Beginning Java Script, Wrox Press, Inc., Revised Edition.
- 10. Alex Homer, Professional ASP 3.0, Wrox Press, Inc.
- 11. Joel Sklar, Principles of Web Design, Thomson Learning, 2001.

IV SEMESTER

PAPER XIII

PRINCIPLES OF COMPILER DESIGN

UNIT-I

Lexical analysis: Regular expression-nondeterministic automata-deterministic automata Equivalent to NFAs-minimizing the states of DFA-implementation of lexical analyzer.

UNIT-II

Syntax analysis: Top down parsing concepts-recursive descent parsing - predictive parsers - non recursive predicate parsing - bottom-up parsing - handle pruning - shift reduce parsing-operator parsing - LR parsers-parser generators -YACC.

UNIT-III

Intermediate code generation: Syntax directed definitions - construction of syntax trees - top down translation - bottom up evaluation of inherited attributed - recursive evaluators-assigning space at compiler construction time - type checking - overloading of functions and operators - polymorphic function.

UNIT-IV

Storage organization: Storage organization-storage allocation strategies - parameter passing - symbol tables - dynamic storage allocation - intermediate languages - representation of declarations - assignment statement - Boolean expression - back patching - procedure calls.

UNIT-V

Code generation and Code optimization: Design of code generators - runtime storage management - basic blocks - flow graphs - register allocation and assignment - DAG representation of basic blocks - peephole optimization - code optimization - the principle sources of optimization - optimization of basic blocks - global data flow analysis - loop optimizations.

Text Book

Alfred Aho, Ravi Sethi, Jeffy D.Ullman, "Compilers - Principles, Techniques and Tools", Pearson, 1986.

- 1. Chattopadhyay Santhanu,"Compiler Design",PHI,2006.
- 2. Holub Allen,"Compilers in C", PHI,1997.

PAPER XIV

PROGRAMMING IN JAVA

UNIT-I

An overview of Java, Java versus C / C++, Object oriented Programming and Technology - Language fundamentals - Data types - variables - type conversion - casting - arrays - operators - arithmetic, bitwise, relational, boolean, precedence - Control Statements.

UNIT-II

Classes - methods - constructors - overloading - inheritance - Packages - interfaces - String handling.

UNIT-III

Exception handling - Input/Output Java streams - Threads - Abstract Windowing Toolkit - Overview, working with Windows, Graphics, Text, Images - AWT Controls - Applets - Scripts - Exploring Java.

UNIT-IV

Laying out components - Introducing Java Foundation Classes - Swing Packages - Swing objects.

UNIT-V

Advanced Java: Java beans - Networking - JDBC - Java API for Data base Connectivity - Multimedia.

Text Book

Patrick Naughton and Herbert Schildt, "Java: The Complete Reference", Tata McGraw-Hill, New Delhi, 1997.

- 1. Aaron Walsh and John Fronckowick, "Java Bible, Programming Version 2", IDG Books Worldwide, Inc. 2000.
 - 2. Balagurusamy E, "Programming with JAVA", TMG, 2007

PAPER XV

RESOURCE MANAGEMENT TECHNIQUES

UNIT-I

Linear Programming Models: Mathematical Formulation - Graphical Solution of linear programming models - Simplex method - Artificial variable Techniques - Variants of Simplex method

UNIT-II

Transportation and Assignment Models: Mathematical formulation of transportation problem - Methods for finding initial basic feasible solution - optimum solution degeneracy - Mathematical formulation of assignment models - Hungarian Algorithm - Variants of the Assignment problem

UNIT-III

Integer Programming Models: Formulation - Gomory's IPP method - Gomory's mixed integer method - Branch and bound technique.

UNIT-IV

Scheduling by Pert and CPM: Network Construction - Critical Path Method - Project Evaluation and Review Technique - Resource Analysis in Network Scheduling

UNIT-V

Queueing Models: Characteristics of Queuing Models - Poisson Queues - (M / M / 1): (FIFO / ∞ / ∞), (M / M / 1): (FIFO / N / ∞), (M / M / C): (FIFO / ∞ / ∞), (M / M / C): (FIFO / N / ∞) models.

Text Books

Taha H.A., Operations Research: An Introduction , 8th Edition, PHI/Pearson Education, 2006.

- 1. A.M.Natarajan, P.Balasubramani, A.Tamilarasi, Operations Research, Prem Kumar Gupta, D.S. Hira, S.Chand & Company Ltd, New Delhi, 3rd Edition, 2003.
- 2. Paneerselvam R,"Operations Research",2/E,PHI,2006.
- 3. Srinivasan R,"Operations Research : Principles and Applications", PHI, 2007.
- 4. Sivarethinamohan R, "Operations research", TMG, 2005.

PAPER XVI

VISUAL PROGRAMMING

UNIT-I

Customizing a form - Writing a simple program - Tool box - Creating control - Name property_Command button - Access keys-Image control - Text boxes - Labels - Message boxes-Grid _Editing tools-Variables data types - String number.

UNIT-II

Displaying information-Determinate tools ,Indeterminate tools-Conditionals built in function-Function and procedure.

UNIT-III

Alies - List - Sorting and searching record_control arrays - Grid control - Project with multiple form - Do events and sub main - Error traffic.

UNIT-IV

VB objects - dialogue boxes - Common control - Menus-MDI forms - Texting - Debugging and Optimization_Working with Graphics.

UNIT-V

Monitoring - Mouse activity - File and handling - File system control - File system objects - COM - Automation BCC servers - OLE drag and drop.

Text Books

Gary Cornell, "Visual Basic 6.0", TMG, 2006.

Reference

Noel Jerke, "Visual Basic (The Complete Reference)", TMG, 1999.

CORE PRACTICAL VII

JAVA LAB

Develop a Program in Java

- 1. To convert Fahrenheit value to centigrade value.
- 2. To create an arithmetic calculator.
- 3. To create a triangular multiplication table.
- 4. To implement matrix operations using arrays.
- 5. To implement stack operations using constructors.
- 6. To implement String operations.
- 7. To perform Operator overloading operations.
- 8. To perform Exception Handling for arithmetic and array exceptions.
- 9. To compute student's result using Inheritance.
- 10. To create sine and cosine series using threads.
- 11. To maintain student's database using JDBC.
- 12. To choose font colour for the text using AWT controls.
- 13. To copy one file to another file using streams.

CORE PRACTICAL VIII VISUAL PROGRAMMING LAB

- 1. Building simple application
- 2. Working with Intrinsic controls and ActiveX controls
- 3. Application with multiple forms
- 4. Application with dialogues
- 5. Application with menus
- 6. Application Using Data Control
- 7. Application using Format Dialogues
- 8. Drag and Drop Events
- 9. Database Management
- 10. Creating ActiveX Controls

ELECTIVE

PAPER III

(to choose either A or B)

A) E-COMMERCE

UNIT-I

Electronic Commerce Environment and Opportunities : Background - Electronic Commerce Environment - Electronic Marketplace Technologies - Modes of Electronic Commerce : Overview - Electronic Data Interchange - Migration to open EDI - Electronic Commerce with WWW/Internet – Commerce Net Advocacy.

UNIT-II

Approaches to Safe Electronic Commerce : Secure Transport Protocols - Secure Transactions - Secure Electronic Payment Protocol - Secure Electronic Transaction - Certificates for Authentication - Security on Web Servers & Enterprise Networks - Electronic Cash and Electronic Payment Schemes : Internet Monetary Payment and Security Requirements - Payment and Purchase Order Process - On-line E-Cash.

UNIT-III

Internet/Intranet Security Issues and Solutions : Need for Computer Security - Specific Intruder Approaches - Security Strategies - Security Tools - Encryption - Enterprise Networking and Access to the Internet - Antivirus Programs - Security Teams.

UNIT-IV

MasterCard/Visa Secure Electronic Transaction: Introduction - Business Requirements - Concepts - Payment Processing - E-mail and Secure E-mail Technologies for Electronic Commerce: Introduction - The means of Distribution - A Model for Message Handling - How Does E-mail Work ? - MIME: Multipurpose Internet Mail Extensions - MOSS: Message Object Security Services - Comparisons of Security Methods - MIME and Related Facilities for EDI over the Internet.

UNIT-V

Internet & Website Establishment: Technologies for Web Servers - Internet Tools Relevant to Commerce - Internet Applications for Commerce - Internet Charges -Internet Access & Architecture - Searching Internet. Applications: EP - Web Based EP - Intellectual Property Issues in EP, Multimedia/Hypermedia Development.

Text Books

Daniel Minoli & Emma Minoli," Web Commerce Technology Handbook", Tata McGraw Hill Publishing Company Ltd., New Delhi : 1999.

- 1. Ravi Kalakota and Andrew B Whinston, "Frontiers of Electronic Commerce", Peasrson Education Pvt. Ltd., New Delhi : 2006.
- 2. Joseph P.T.,"E- commerce Indian Perspective",2/E, PHI, 2006.

B) MULTIMEDIA AND ITS APPLICATIONS

UNIT-I

Multimedia: Introduction - use - making multimedia - multimedia skills - hardware - Memory and Storage devices, Input devices, Output hardware, Communication devices.

UNIT-II

Multimedia Software: Basic Tools - Text editing, Image Editing Tool - Painting and Drawing Tools, Sound Editing Programs, Video Formats, Digital movie tools - Authoring tools - types.

UNIT-III

Multimedia building blocks: Text - Font editing, Designing, Hypermedia -Sound - Digital audio, MIDI - Images - Still images, Image file formats - Animation - Video - Standards, Analog, Digital Video, Recording, Editing.

UNIT-IV

Multimedia and Internet: Connections, Services - Tools for WWW - Designing for WWW - Text, Images, Sound, Animation.

UNIT-V

Assembling and Delivering a Project: Planning and Costing -Designing and Producing -Content and Talent - Delivering - CD ROM Technology - Multimedia applications single user, networks.

Text Book

Tay Vaughan, "Multimedia: Making it work", 7/E, TMG, 2007.

- 1. Anleigh P.K, and Takkar K,"Multimedia Systems Design",PHI,2003.
- 2. Linda Tway,"Multimedia in Action", AP professional, 1995

- 3. Judith Jeffcoate, "Multimedia in practice Technology and Applications", PHI, 1995.
- 4. Walterworth John A, "Multimedia Technology and Applications ", Ellis horowood Ltd, 1991.
- 5. Arch C Luther, " Designing Interactive Multimedia ", bantam Books, 1992.

V SEMESTER

PAPER XVII

WEB TECHNOLOGY

UNIT-I

Internet Basic - Introduction to HTML - List- Creating Table - Linking document - Frames - Graphics to HTML Doc - Style Sheet - Style sheet basic - Add Style to document - Creating Style sheet rules - Style sheet Properties - Font - List - Color and Background color - Box - Display Properties.

UNIT-II

Introduction to Java Script - Advantage of JavaScript Syntax - Data type - Variable - Array - Operator and Expression - Looping Constructor - Function - Dialog box.

UNIT-III

JavaScript document object model - Introduction - Object in HTML - Event Handling - Window Object - Document object - Browser Object - Form Object - Navigator object - Screen Object - Built in Object - User defined Object - Cookies

UNIT-IV

ASP .NET Language structure - Page structure - Page event , Properties & Compiler Directives. HTML server controls - Anchor, Tables, Forms, Files. Basic Web server Controls - Label, Textbox, Button, Image, Links, Check & Radio button, Hyperlink. Data List Web Server Controls - Check box list, Radio button list, Drop down list, List box, Data grid, Repeater.

UNIT-V

Request and Response Objects, Cookies, Working with Data - OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced Issues - Email, Application Issues, Working with IIS and page directives, Error handling. Security - Authentication, IP Address, Secure by SSL & Client Certificates.

Text Books

- 1. Bayross, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl, CGI, BPB Publications, 2000.
- 2. J. Jaworski, Mastering Javascript, BPB Publications, 1999

- 1. Richard Anderson, Professional ASP .NET, Wrox Press Ltd.
- 2. T.A. Powell, Complete Reference HTML(3rd Edition) , TMH, 2002
- 3. G. Buczek, ASP .NET Developers Guide, TMH 2002
- 4. Achyut S Godbole, Atul Kahate, "Web technologies TCP/IP to Internet Application Architectures", TMG, 2006.

PAPER XVIII

COMPUTER NETWORKS

UNIT-I

Introduction to networks and communication media: Uses - network hardware - network software - reference models - example networks - network standardization - basis for data communication - transmission media - wireless transmission - telephone systems - satellite communication.

UNIT-II

Data link layer: Data link layer design issues - error detection and correction methods - elementary data link protocols - sliding window protocols - verification methods - channel allocation - multiple access protocols - IEEE 802 standards.

UNIT-III

Network layer: Network design issues - routing algorithms - congestion control algorithms - internetworking - network layer in the Internet.

UNIT-IV

Transport layer: Transport service - transport protocols - Internet transport protocols UDP - TCP - performance issues.

UNIT-V

Application layer: Application layer design issues - domain name system - electronic mail - WWW - multimedia - other applications - network security - basic cryptography - DES-RSA.

Text Book

Andrews S.Tanenbaum,"Computer Networks ",4/E, PHI/Pearson Education, 4/e, 2003.

- 1. Behrouz Forouzan, "Data Communication and Networking", 2 / E, TMH, 2006
- 2. William Stallings ,"Data and Computer Communications",2/E, PHI/Pearson Education.
- 3. Kundu Sudakshina,"Computer Networks, PHI, 2006.
- 4. ISRD Group, "Data communication and computer networks", TMG, 2007.
- 5. Gupta P.C., "Data Communications and Computer Networks", PHI, 2006. Singh Brijendra, "Data Communications and Computer Networks", 2/E.PHI, 2006.

PAPER XIX

C# PROGRAMMING AND .NET FRAMEWORK

UNIT-I

Introduction to the .NET Platform - Common Language Runtime(CLR) - The Common Type Specification(CTS) - The Common Language Specifications (CLS) - Assemblies - .NET Base Classes - CLR Debugger.

UNIT-II

Introduction to C# - Data Type - Operators - Flow Control and Iteration - Arrays and Strings - Basics of C# Classes - Boxing and Unboxing - Reflection - Interoperability - The Preprocessors - Attributes - Name Spaces.

UNIT-III

Object-Oriented Programming in C# - Encapsulation, Inheritance, and Polymorphism - Exception Handling - Garbage Collection - Input and Output (Directories, Files, and Streams).

UNIT-IV

Implementing the ICIoneable and IComparable Interfaces - Introduction to .NET Collections (including Custom Collections) - Custom Indexers, Delegates and Events - Multithreading and Synchronization - Type Reflection and Attributes - Programming the Windows Registry.

UNIT-V

GDI+ Graphics Tutorial (including Fonts, Brushes, Images, and using .NET Resources) - COM, COM+, and .NET Interoperability - ADO.NET for Database Programming with Datasets and Object Model. - Windows Applications: Winforms - Winforms Namespace - Creating Winforms Applications in VS.NET - Distributed applications with .NET - .NET remoting architecture - .NET and .COM - Marshalling - Deployment.

Text Books

- 1. Robert J.Oberg, "Introduction to C# using .NET", PHI, 2002.
- 2. Andrew Troelsen, "C# and .NET Platform", Apress, 1st edition, 2001.
- 3. E.Balagurusamy, "Programming in C#", Tata McGraw Hill, 2002.

Reference Books

- 1. Ben Albahari, "Peter Drayton and Brad Merrill", C# Essentials, SPD, 2001.
- 2. Microsoft, "C# Language Specifications", WP Publishers and Distributors Pvt.Ltd., 2001.
- 3. Simon Robins on Christian Nagel, Karli Watson, Jay Gltnn, Morgan skinner, Bill Evjen, "Professional c#", Wiley Dreamtech, 3rd edition, 2004.
- 4. David S. Platt, "Introducing Microsoft .NET", Microsoft Press, 3rd edition, 2003.

PAPER XX DATA MINING AND WAREHOUSING

UNIT-I

Introduction: Definition of data mining - data mining vs query tools - machine learning - taxonomy of data mining tasks - steps in data mining process - overview of data mining techniques.

UNIT-II

Data Warehousing: Definition - Multidimensional Data Model - Data Cube - Dimension Modelling - OLAP Operations - Warehouse Schema - Data Warehouse Architecture -Data Mart - Meta Data - Types of Meta Data - Data Warehouse Backend Process -Development Life Cycle.

UNIT-III

Data Pre-Processing And Characterization :Data Cleaning - Data Integration and Transformation - Data Reduction - Discretization and Concept Hierarchy Generation -Primitives - Data Mining-Query Language - Generalization - Summarization -Analytical Characterization and Comparison - Association Rule - Mining Multi Dimensional data from Transactional Database and Relational Database.

UNIT-IV

Classification: Classification - Decision Tree Induction - Bayesian Classification - Prediction - Back Propagation - Cluster Analysis - Hierarchical Method - Density Based Method - Grid Based Method - Outlier Analysis.

UNIT-V

Cluster analysis: Types of data - Clustering Methods - Partitioning methods - Model based clustering methods - outlier analysis.

Advanced topics: Web Mining - Web Content Mining - Structure and Usage Mining - Spatial Mining - Time Series and Sequence Mining - Graph Mining Applications : Case studies in Data Mining applications

Text Books

- 1. Paulraj Ponnaiah, Data Warehousing Fundamentals, Wiley Publishers, 2001.
- 2. Jiawei Han, Micheline Kamber, Data Mining: Concepts and Techniques, Morgan Kaufman Publishers, 2006.

Reference Books

- 1. Usama M.Fayyad, Gregory Piatetsky Shapiro, Padhrai Smyth, Ramasamy Uthurusamy, Advances in Knowledge Discover and Data Mining, The M.I.T. Press, 2007.
- 2. Ralph Kimball, Margy Ross, The Data Warehouse Toolkit, John Wiley and Sons Inc., 2002.
- 3. Alex Berson, Stephen Smith, Kurt Thearling, Building Data Mining Applications for CRM, Tata McGraw Hill, 2000.
- 4. Margaret Dunham, Data Mining: Introductory and Advanced Topics, Prentice Hall, 2002.
- 5. Daniel T. Larose John Wiley & Sons, Hoboken, Discovering Knowledge in Data: An Introduction to Data Mining, New Jersey, 2004.

CORE PRACTICAL IX

WEB TECHONOLOGY and .NET LAB

Exercises for WEB TECHONOLOGY

- 1. Create a simple page introducing you and modify it with bullet list.
- 2. Put an existing image on a web page. Create table with data
- 3. Create a web page with various HTML tags.
- 4. Write a script to create an array of 10 elements and find the total of it.
- 5. Write a function in JavaScript to reverse the string and check for palindrome
- 6. Create a simple calculator using form fields
- 7. Create a document and add a link to show the page using mouse events
- 8. Create Web form for an online library and do the various operations.
- 9. Create Web form for online Banking application system
- 10. Create Web form for online Railway Reservation system
- 11. Create Web form for online Sales system
- 12. Create Web form for online Airline Reservation system

Exercises for .NET Lab

- 1. Program for mean and Standard Deviation
- 2. Check for prime nos.
- 3. Sorting nos. using command line arguments
- 4. Max. and Min. of nos.
- 5. Separation of list into odd and even lists
- 6. Bill preparation of items
- 7. Addition of two times using class.
- 8. Bank transaction using class
- 9. Evaluation of objective type questions using files.
- 10. Exception handling

CORE PRACTICAL X MINI PROJECT

Students are to take up sample project development activities with the guidelines given below:

- Preparing a project brief proposal including
 - Problem Identification
 - Developing a model for solving the problem
 - A statement of system / process specifications proposed to be developed (Data Flow Diagram)
 - List of possible solutions including alternatives and constraints
 - Cost benefit analysis
 - Time line activities
- A report highlighting the design finalization [based on functional requirements & standards (if any)]
- A presentation including the following
 - Implementation phase (Hardware / Software / both)
 - \circ Testing & Validation of the developed system
 - Learning in the project
- Consolidated report preparation

ELECTIVE (to choose either A or B)

PAPER IV

A) NETWORK SECURITY

UNIT-I

Security attacks - security services - a model for internetwork security -conventional encryption model - steganography - the data encryption standard.

UNIT-II

Principles of public key cryptosystems - the RSA algorithm - key management -Diffie-Hellman key exchange - prime and relatively prime numbers - Fermat's ad Eulers's theorems - testing of primality - Euclid's algorithm - the Chinese remainder theorem.

UNIT-III

Authentication requirements - authentication functions - message authentication codes - hash functions - digital signatures - authentication protocols - digital signature standards.

UNIT-IV

Kerberos - pretty good privacy - S/MIME - IP security overview - IP security architecture - authentication header.

UNIT-V

Intruder - viruses and related threads - recommended reading - firewall design principles - trusted system.

Text Books

William Stallings,"Cryptography and network security", 4/E, PHI, 2006.

- 1. Singh, Brijendra, "Network Security and Management", PHI, 2007.
- 2. Charles.P.Pleeger, "Security in Computing", PHI, 1989.

- 3. Hans, "Information and Communication Security", Springer Verlag, 1998.
- 4. Simonds, "Network Security", McGraw Hill, 1998.
- 5. Derek Atkins, "Internet Security", Techmedia, 1998.
- 6. Kernel Texplan, "Communication Network Management", PHI, 1992.
- 7. BAXER, "Networking Security", MCGRAW-HILL, 1996.

B) ENTERPRISE RESOURCES PLANNING (ERP)

UNIT-I

Introduction to ERP: Integrated management Information-Seamless Integration-Supply chain management - Resource management-Integrated data model-Benefits of ERP-Business engineering and ERP-Definition of business engineering-Significance of business Engineering - Principles of business engineering-Business engineering with Information technology.

UNIT-II

BUSINESS MODELING FOR ERP:Building the business model-ERP implementation-an overview-Role of consultant,vendors and users-Customization-Precautions-ERP post implementation options.ERP implementation technology-Guidelines for ERP implementation.

UNIT-III

ERP AND THE COMPETITIVE ADVANTAGE: ERP domain-MPG/PRO-IFS/ Avalon-Industrial and financial systems-Baan IV SAP- Market dynamics and dynamic strategy.

UNIT-IV

COMMERCIAL ERP PACKAGE: Description-multi-client server solution-Open technology-User Interface- Application integration.

UNIT-V

ARCHITECTURE: Basic architecture concepts-The system control Interfaces-Services-Presentation interface-Database interface.

TEXT BOOK:

1. Vinod kumar Garg &N.K.Venkita krishnan, Enterprise resources planning - Concepts and practice, PHI, 1998.

REFERENCES:

- 1. Jose Antonio Fernandz, The SAP R/3 handbook, TMH, 1998.
- 2. Sadagopan: ERP Tata McGraw Hill, 1999.

VI SEMESTER

PROJECT WORK AND VIVA VOCE

The objective of the project is to enable the students to work in a project of latest topic / research area / industrial applications. Each project student shall have a guide who is a faculty member.

During this semester the students are expected to do literature survey, formulate the problem and form a methodology of arriving at the solution of the problem. Also during this semester, the students are expected to complete the project and submit a full-fledged report comprising of the complete system developed along with implementation and test results. The departmental committee shall examine the students for 50 marks and the evaluation is based on continuous internal assessment comprising of two reviews.

After two reviews internal 50 marks (is based on seminar (20 marks), demo (20 marks) and internal viva-voce (I0 marks)) will be given by the guide with the consultation of the departmental committee. At end of the semester, a viva-voce examination will be conducted for 150 marks (75 marks for internal examiner and 75 marks for external examiner).
