THIRUVALLUVAR UNIVERSITY

MASTER OF SCIENCE

DEGREE COURSE

M.Sc. COMPUTER SCIENCE

UNDER CBCS

(with effect from 2008-2009)

The Course of Study and the Scheme of Examinations

Year / Semester	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Exam hrs	Max.Marks		
							IA	Uni. Exam.	Total
I Year I Semester	Core	Paper I	Object Oriented Programming using C++	4	3	3	25	75	100
	Core	Paper II	Computer Architecture and Parallel Processing	5	4	3	25	75	100
	Core	Paper III	Advanced DBMS	4	3	3	25	75	100
	Core Practical	Practical I	Object Oriented Programming using C++ Lab	6	4	3	40	60	100
	Core Practical	Practical II	Advanced DBMS Lab	6	4	3	40	60	100
	Elective I	Paper I	(a) Operating System **(or)** (b) Object Oriented Analysis and Design	5	5	3	25	75	100
I Year II Semester	Core	Paper IV	Data Communication and Networks	4	3	3	25	75	100
	Core	Paper V	Visual Programming	5	4	3	25	75	100
	Core	Paper VI	Microprocessor and its Applications	4	3	3	25	75	100
	Core	Practical III	Visual Programming Lab	5	4	3	40	60	100
	Core	Practical IV	Microprocessor Lab	5	4	3	40	60	100
			Human Rights	2	2	3	25	75	100
	Elective II	Paper II	(a) Embebbed System **(or)** (b) Mobile Computing	5	5	3	25	75	100
II Year III Semester	Core	Paper VII	Design and Analysis of algorithms	4	4	3	25	75	100
	Core	Paper VIII	Internet and Java Programming	4	4	3	25	75	100
	Core	Paper IX	Data Mining and Warehousing	4	4	3	25	75	100
	Core Practical	Practical V	Internet and Java Lab	4	4	3	40	60	100

Year / Semester	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Exam hrs	Max.Marks		
							IA	Uni. Exam.	Total
	Core Practical	Practical VI	Mini Project	4	4	3	40	60	100
	Elective III	Paper III	(a) Network Security **(or)** (b) Principles of Complier Design	5	5	3	25	75	100
	Elective IV (Non-Major Subject)	Paper IV	Multimedia and Animation	5	5	3	25	75	100
II Year IV Semester			Project Work and *viva voce**	30	12	-	50	150	200
			Total	**120**	**90**				**2200**

* Two reviews are to be conducted during the period of Project Work

THIRUVALLUVAR UNIVERSITY

M.Sc. COMPUTER SCIENCE

SYLLABUS

UNDER CBCS

(with effect from 2008-2009)

I SEMESTER

PAPER I

OBJECT ORIENTED PROGRAMMING USING C++

UNIT-I

Introduction to OOP: Overview of C++ - classes - structures - union - friend function - friend class - inline function - constructors - static members - scope resolution operator - passing 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 functions - overloading 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.

Reference

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 II

COMPUTER ARCHITECTURE AND PARALLEL PROCESSING

UNIT-I

Central Processing Unit: General Register and Stack Organization - Instruction formats - Addressing Modes - Data Transfer and Manipulation - Program Control - RISC - Pipelining - Arithmetic, Instruction and RISC Pipelining - Vector Processing - Array Processor.

UNIT-II

Input-Output organization - Peripheral devices - I/O Interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt - DMA - I/O Processor - Serial Communication - Memory Organization - Memory Hierarchy - Auxiliary Memory - Associative Memory and Virtual Memory

UNIT-III

Need for parallel computers, Modules of Computation, Analyzing Algorithms, Expressing Algorithms - Broadcast, All sum and selection algorithms and SIMD model - Searching a sorted sequence: EREW, CREW SMSIMD algorithms, Searching a Random sequence on shared memory SIMD, Tree and mesh interconnected computers.

UNIT-IV

Sorting on a Linear array, Sorting a Mesh, Sorting on EREW SIMD computer, MIMD Enumeration sort, MIMD Quick sort, Sorting on other Networks.

UNIT-V

Matrix by matrix multiplication: Mesh Multiplication, Cube multiplication - Solving numerical problems, Solving systems of Linear equations: An SIMD algorithm, An MIMD algorithm.

Text Books

1. M. Morris Mano - Computer System Architecture PHI -1993
2. V.C. Hamacher, G. Vranesic, S.G. Zaky - Computer Organisation, TMG, 1990
3. J.P.Hayes, Computer Architecture, McGraw Hill, 1988'
4. Selim G.AKL - The Design and Analysis of parallel Algorithms - PHI.
5. Mechael Quinn - Parallel Algorithms - McGraw Hill.

Reference

1. Nicholas Carter, "Computer Architecture", TMG, 2006.
2. Kai Hwang, "Advance computer architecture", TMG, 2006.

PAPER III

ADVANCED DBMS

UNIT-I

Relational Model: Introduction - Structure of Relational Data Base - Relational Algebra - Relational Calculus. Relational Query Languages - Introduction - Codd's Rules - Structured Query Language - Embedded Structured Query Language. ER Model - Basic Concepts - Conversion of ER Model into Relations - ER Diagram Symbols.

UNIT-II

Data Base Design: Introduction - Software Development Life Cycle - Database Development Life Cycle - Automated Design Tools. Functional Dependency and Decomposition - Functional Dependency - Decomposition. Normalization - Introduction - Normalization - Normal Forms - BCNF - 4 NF - 5 NF.

UNIT-III

Query Processing and Optimization: Introduction - Query Processing - Syntax Analyzer - Query Decomposition - Query Optimization. Transaction Processing and Concurrency Control: Transaction Concepts - Concurrency Control - Locking Methods - Timestamp Methods - Optimistic Methods.

UNIT-IV

Data Base Recovery Systems: Introduction - Recovery Concepts - Types of Failures - Types of Recovery - Recovery Techniques - Buffer Management. Data Base Security: Goals - Firewalls - Data Encryption.

UNIT-V

Distributed Data Base Systems: Introduction - Distributed Data Bases - Architecture of Distributed Data Bases - Distributed Data Base System Design - Distributed Query Processing. Emerging Data Base Technologies: Internet Data Bases - Digital Libraries - Multimedia Data Bases - Mobile Data Bases - Spatial Data Bases.

Text Books

1. S.K. Singh, "Database Systems Concepts, Design and Applications", Pearson Education Pte. Ltd., New Delhi: 2006.
2. C.J. Date and others, "An Introduction to Database Systems", Eighth Edition, Pearson Education Pte. Ltd., New Delhi: 2006.

Reference

1. Abraham Silberschatz, "Database Systems", McGraw Hill International, 1997.
2. Paneerselvam R, "Database management systems", PHI, 2005.
3. Narang Rajesh, "Database management systems", PHI, 2005.
4. ISRD Group, "Introduction to database management systems", TMG, 2006.
5. Ramakrishnan, Gehrke, "Database management systems", 3/E, TMG, 2003.

CORE PRACTICAL I

OBJECT ORIENTED PROGRAMMING USING C++ 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

CORE PRACTICAL II

ADVANCED DBMS (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

ELECTIVE I

PAPER I

(to choose either A or B)

A) 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.

References

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.
5. Mukesh singhal, Niranjan G shivaratri, "Advanced concepts in operating systems", TMG, 2007.

B) OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT-I

System Development - Object Basis - Development life cycle - Methodologies - Patterns - Frameworks - Unified Approach - UML

UNIT-II

Use - Case Models - Object Analysis - Object relations - Attributes - Methods - Class and object responsibilities - Case studies

UNIT-III

Design Process - Design Axioms - Class Design - Object storage - Object Interpretability - Case Studies

UNIT-IV

User interface design - View layer Classed - Micro - level processes - View Layer Interface - Case studies

UNIT-V

Quality Assurance Tests - Testing strategies - Object oriented on testing - Test Cases - Test Plans - Continuous testing - Debugging Principles - System usability - Measuring user satisfaction - Case Studies.

Text Book

Ali Bahrami, "Object Oriented Systems Development", McGraw Hill International Edition, 1999.

Reference

Grady Booch ," Object oriented Analysis and design ", Pearson Education ,2/e.

II SEMESTER

PAPER IV

DATA COMMUNICATION AND NETWORKS

UNIT-I

Data Communications and Networking Overview: A Communication Model - Data Communications - Data Communication Networking. Protocol Architecture: Need - A Simple Protocol Architecture - OSI - TCP/IP Protocol Architecture. Guided Transmission Media - Wireless Transmission.

UNIT-II

Digital Data Communication Techniques: Asynchronous and Synchronous Transmission - Types of Errors - Error Detection - Error Correction - Line Configuration - Interfacing. Data Link Control Protocols: Flow Control - Error Control – High - Level Data Link Control.

UNIT-III

Circuit Switching and Packet Switching: Switched Communication Networks - Circuit - Switching Networks - Concepts - Packet-Switching Principles - X.25 - Frame Relay. Routing in Switched Networks: Routing in Circuit - Switching Networks - Routing in Packet-Switching Networks - Least-Cost Algorithms. Congestion in Data Networks: Effects of Congestion - Congestion Control - Traffic Management.

UNIT-IV

Local Area Network Overview - Background - Topologies and Transmission Media - LAN Protocol Architecture - Bridges. High-Speed LANs - The Emergence - Ethernet - Token Ring - Fiber Channel. Wireless LAN Technology.

UNIT-V

Internet Protocols: Basic Protocol Functions - Principles of Internetworking - Connectionless Internetworking - Internet Protocol. Network Security - Security Requirements and Attacks - Confidentiality with Symmetric Encryption - Message Authentication and Hash Function - Public - Key Encryption and Digital Signatures.

Text Books

1. Wiliam Stallings, "Data Computer Communications", Seventh Edition, Pearson Education Pte. Ltd., New Delhi: 2004.
2. Behrouz and Forouzan, "Introduction to Data Communication and Networking", Tata McGraW Hill Publishing Company Ltd., New Delhi: 1999.

Reference

1. ISRD Group, "Data communication and computer networks", TMG, 2007.
2. Gupta P.C., "Data Communications and Computer Networks", PHI, 2006.
3. Singh Brijendra, "Data Communications and Computer Networks", 2/E.PHI, 2006.

PAPER V

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.

PAPER VI

MICROPROCESSOR AND ITS APPLICATIONS

UNIT-I

Microcomputer, microprocessor and assembly language - microprocessor architecture and its operations - memory input/output - interfacing devices - 8085 based microcomputer system - addressing modes - instruction classification, format, timings and operation status.

UNIT-II

Instruction set - Data transfer instructions: Arithmetic operations - logic and branch operation - Looping, counting and indexing - 16 bit arithmetic instructions - arithmetic operation related to memory - logic operations: rotate, compare, counters and time delays.

UNIT-III

Stack - subroutine - call and Return instruction - parallel input/output - 8255 programmable peripheral interface - 8253 Programmable timer - The 8085 Interrupts: 8259 programmable interrupt controller - Direct Memory Access - 8257 DMA controller - Restart as software instruction.

UINT-IV

Basic concepts of advanced microprocessors - concepts of arithmetic coprocessor - The 80x87 architecture - Introduction to 80386 microprocessor - 80386 Memory management - The memory paging mechanism - Introduction to the 80486 microprocessor. Introduction to the Pentium Microprocessor.

UNIT-V

Microprocessor Applications: Interfacing keyboards, displays, A/D and D/A converters, stepper motor control.

Text Book

Ramesh Goankar S, Microprocessor Architecture, Programming and Applications with 8085/8080 A, Wiley Eastern limited, 1986.

Reference

1. Badri Ram, Fundamentals of Microprocessor and Microcomputer, Dhanpar Rai Sons, 1988.
2. Douglas V.Hall, Digital System and Microprocessors, McGraw Hill, 1996.
3. Yu chang Liu and Glenn A.Gibson, Microcomputer System. The 8086/8088 family, Prentice Hall of India 1991.
4. B.Govindarajalu, IBM PC and CLONES, Tata McGraw Hill 1991.
5. Barry B. Brey. The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, And Pentium Pro Processor Architecture, Programming and Interfacing 7th Edition, PHI, 2006.

CORE PRACTICAL III

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

CORE PRACTICAL IV

MICROPROCESSOR LAB

1. Study of 8085 microprocessor.
2. Performing logical operations.
3. Performing 8 bit arithmetic operations.
4. Performing 16 bit arithmetic operations.
5. Finding the sum of N elements.
6. Finding maximum and minimum in an array
7. Conversion of hexadecimal number into binary number.
8. Sorting an array of numbers.
9. Finding number zeros, positive and negative numbers in an array.
10. Finding the square of a number using look up table.
11. Square wave generation using 8253.
12. Simulation of counters using 8255.
13. Data transfer using USART.
14. Message display using 8279.

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

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 & K. Cheous (Ed) - International Encyclopedia of Peace, Security 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.

ELECTIVE II

PAPER II

(to choose either A or B)

A) EMBEDDED SYSTEMS

UNIT-I

Introduction: Overview of dedicated and automated systems - their specific requirements - robust design - environmental issues - temporal constraints - technological constraints - software systems - product design cycle.

UNIT-II

Development of a System Specification: Evaluation - justification of the available levels of system integration (custom chip design through turnkey - systems) - technological choice.

UNIT-III

Software Issues: Development environment compilers - linkers - debuggers - emulators - real time operating systems - kernels - Designing and implementing code for dedicated systems.

UNIT-IV

Hardware Issues: Choice of processor - I/O - memory - speed integration - development facilities - economics - DSP devices.

UNIT-V

Transducers: Sensors for measuring physical phenomena - output devices such as power actuators - motors. Data transformation - signal conditioning - data conversion. The impact of EMC regulations on design practice.

Text Book

Heath S. "Embedded Systems Design", Elsevier, 1997.

References

1. Kirk Zurell - "C Programming for Embedded Systems" R & D Books - 2000
2. David. E, Simon, "An embedded software primer", PHI/Pearson Education, 2001.
3. Michael Barr, "Programming Embedded Systems in C and C++", Shroff Publishers & Distributors Pvt.Ltd., Calcutta, 2001.
4. Raj Kamal, "Embedded systems architecture, programming and design", TMG, 2007

B) MOBILE COMPUTING

UNIT-I

Introduction: Medium Access Control: Motivation for Specialized MAC - SDMA - FDMA - TDMA - CDMA - Comparison of Access mechanisms - Tele communications: GSM - DECT - TETRA - UMTS - IMT - 200 - Satellite Systems: Basics - Routing - Localization - Handover - Broadcast Systems: Overview - Cyclic Repetition of Data - Digital Audio Broadcasting - Digital Video Broadcasting.

UNIT-II

Wireless Networks: Wireless LAN: Infrared Vs Radio Transmission - Infrastructure Networks - Ad hoc Networks - IEEE 802.11 - HIPERLAN - Bluetooth - Wireless ATM: Working Group - Services - Reference Model - Functions - Radio Access Layer - Handover - Location Management - Addressing Mobile Quality of Service - Access Point Control Protocol.

UNIT-III

Mobile Network Layer: Mobile IP: Goals - Assumptions and Requirement - Entities - IP packet Delivery - Agent Advertisement and Discovery - Registration - Tunneling and Encapsulation - Optimization - Reverse Tunneling - IPv6 - DHCP - Ad hoc Networks.

UNIT-IV

Mobile Transport Layer: Traditional TCP - Indirect TCP - Snooping TCP - Mobile TCP - Fast retransmit/ Fast Recovery - Transmission/ Timeout Freezing - Selective Retransmission - Transaction Oriented TCP.

UNIT-V

WAP: Architecture - Datagram Protocol - Transport Layer Security - Transaction Protocol - Session Protocol - Application Environment - Wireless Telephony Application.

Text Books

J.Schiller, Mobile Communication, Addison Wesley, 2000.

Reference

1. William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.
2. William Stallings, Wireless Communication and Networks, PHI/ Pearson Education, 2003.
3. Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.
4. Asoke K Talukder, Roopa R Yavagal, "Mobile computing", TMG, 2006.

III SEMESTER

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

Reference

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

INTERNET AND JAVA PROGRAMMING

UNIT-I

Internet concepts - Internet services - Types of Accounts - Media for Internet - ISP - TCP/IP and connection software - Disconnecting from the internet - Dial - up Networking - Setting up and internet connection - Testing connection - Contenders - Issues in high - speed connection - Connecting via ISDN and cable modem

UNIT-II

E-mails - Downloading E-mails - Signatures and Stationery - Web based E-mail - E-mail tasks - Outlook express - Sending and Receiving files using Eudora - Outlook express and Pine - Multiple E-mail accounts - Sending from letters - Formatting e-mail - E-mail mailing lists.

UNIT-III

Servlet overview - The java web server - your first servlet - Servlet chaining - Server side includes - Session Management - Security - HTML forms - Using JDBC in servlets - Applet to servlet communication - The Software component assembly model - The java beans development kit - Developing beans - Notable beans - Using infobus - Glasgow developments

UNIT-IV

EJB architecture - EJB requirements - Design and implementation - EJB session beans - EJB entity beans - EJB Clients - Deployment - tips, tricks and traps for building distributed and other systems - Implementation and future directions of EJB.

UNIT-V

Variable in pearl - Pearl control structures and operators - Functions and Scope.

Text Books

1. Margaret Levine Young - Internet - The Complete Reference - Millennium Edition - TMH Edition 1999.
2. Harley Hahn - The Internet - Complete reference - Second Edition TMH Edition.
3. Karl Moss - Java Servlets - Second Edition - Tata McGraw Hill Edition.
4. Deitel, Deitel, "Java How to Program", 6/E, PHI, 2005.
5. Dustin T. Callway - Inside Servlets - Addison Wesley
6. Joseph O'Neil - Java Beans Programming - TMH
7. Tomvalesky - Enterprise Java Beans - Addison Wesley
8. Cay G. Horstmann & Gary Cornell - Core Java - Vol II Advanced Features - Addison Wesley Pvt. Ltd. Indian Branch

PAPER IX

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.

PRACTICAL V

INTERNET AND JAVA LAB

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images
4. Write programs in Java to do the following.
   - Set the URL of another server.
   - Download the homepage of the server.
   - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
   - HTTP request
   - FTP
   - SMTP
   - POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets

8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML
   i) To embed a map in a web page
   ii) To fix the hot spots in that map
   iii) Show all the related information when the hot spots are clicked.
10. Create a web page with the following.
   i) Cascading style sheets.
   ii) Embedded style sheets.
   iii) Inline style sheets.
   iv) Use our college information for the web pages.

PRACTICAL VI

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)
    - Testing & Validation of the developed system
    - Learning in the project
- Consolidated report preparation

ELECTIVE III

(to choose either A or B)

PAPER III

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.

Reference

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) 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.

Reference

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

ELECTIVE IV

PAPER IV

(NON MAJOR SUBJECT)

MULTIMEDIA AND ANIMATION

UNIT-I

Definition - Taxonomy - Multimedia Information Representation - Text - Images - Audio - Video - Multimedia Architecture - Multimedia Applications - Challenges of Multimedia Systems.

UNIT-II

Compression Principles - Need for Compression - Redundancy and Visibility - Text Compression - Binary Image Compression - Color, Gray Scale and Still - Video Image Compression - Audio Compression - Video Compression.

UNIT-III

Data and File Formats : RTF, TIFF, RIFF, MIDI, JPEG, AVI Video File Formats, MPEG Standards - TWAIN Architecture - Digital Audio and Video as Multimedia I/O Technology - Animation.

UNIT-IV

Multimedia Application Design - Virtual Reality & Design - Organizing Multimedia Databases - Application Workflow Design Issues - Distributed Application Design Issues.

UNIT-V

Multimedia Presentation and Authoring - Hypermedia Messaging - Multimedia in Future : High Definition Television and Desktop Computing - Knowledge Based Multimedia systems.

Text Books

1. Prabhat K. Andleigh and Kiran Thakrar, Multimedia System Design, Pearson Education.
2. Ralf Steinmetz and Klara Nahrstedt, Multimedia Computing, Communications and Applications, Pearson Education.
3. Fred Halsall, Multimedia Communications : Applications, Networks, Protocols and Standards, Pearson Education.
4. John F Koegel Buford, Multimedia Systems, Pearson Education.
5. Judith Jeffcoate, Multimedia in Practice - Technology and Applications, Prentice Hall of India, 2001.

SEMESTER IV

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 (10 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).

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