THIRUVALLUVAR UNIVERSITY

MASTER OF SCIENCE

DEGREE COURSE

M.Sc. INFORMATION TECHNOLOGY

UNDER CBCS

(With effect from 2017-2018)

The Course of Study and the Scheme of Examinations

Year / Semester	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Max.Marks		
						CIA	Uni. Exam.	Total
I Year I Semester	MAIN	Paper-1	Principles of Communication System	4	4	25	75	100
	MAIN	Paper-2	Object Oriented Programming	4	4	25	75	100
	MAIN	Paper-3	Data Base Management System	4	4	25	75	100
	MAIN	Practical I	Object Oriented Programming Lab	5	-	-	-	-
	MAIN	Practical II	RDBMS Lab	5	-	-	-	-
	MAIN	Practical III	Visual Programming Lab	5	-	-	-	-
	Elective	Paper-1	**(to choose 1 out of 3)** A)Computer Architecture B)Discrete Mathematics C)Operating System	3	3	25	75	100
				30	**15**	**100**	**300**	**400**
I Year II Semester	MAIN	Paper-4	Visual Programming	4	4	25	75	100
	MAIN	Paper-5	Computer Networks	4	4	25	75	100
	Compulsory Paper		**Human Rights**	4	4	25	75	100
	MAIN	Practical I	Object Oriented Programming Lab	5	5	25	75	100
	MAIN	Practical II	RDBMS Lab	5	5	25	75	100
	MAIN	Practical III	Visual Programming Lab	5	5	25	75	100
	Elective	Paper-2	**(to choose 1 out of 3)** A) Software Engineering B) E-Commerce C) Telecommunication Switching Techniques	3	3	25	75	100
				30	**30**	**175**	**525**	**700**

Year / Semester	Subject	Paper	Title of the Paper	Ins. Hrs/ Week	Credit	Max.Marks		
						CIA	Uni. Exam.	Total
II Year III Semester	MAIN	Paper-6	Internet Programming	4	4	25	75	100
	MAIN	Paper-7	Mobile Computing	4	4	25	75	100
	MAIN	Paper-8	Computer Graphics and Multimedia	4	4	25	75	100
	MAIN	Practical IV	Network Lab	5	0	-	-	-
	MAIN	Practical V	Internet Programming Lab	5	0	-	-	-
	MAIN	Practical VI	Graphics and Multimedia Lab	5	0	-	-	-
	Elective	Paper-3	**(to choose 1 out of 3)** A) JSP and EJB B) Client Server Computing C) Image Processing	3	3	25	75	100
				30	**15**	**100**	**300**	**400**
II Year IV Semester	MAIN	Paper-9	Software Project Management	4	4	25	75	100
	MAIN	Paper-10	Network Security	4	4	25	75	100
	MAIN	Practical IV	Network Lab	5	5	25	75	100
	MAIN	Practical V	Internet Programming Lab	5	5	25	75	100
	MAIN	Practical VI	Graphics and Multimedia Lab	5	5	25	75	100
	MAIN	Paper-11	*Project Work / Dissertation and *viva voce*	4	4	25	75	100
	Elective	Paper-4	**(to choose 1 out of 3)** A) High speed Networks B)Optical and Satellite Communication C) Component Technology	3	3	25	75	100
				30	**30**	**175**	**525**	**700**

Subject	Papers	Credit	Total Credits	Marks	Total marks
MAIN	10	4-5	46	100	1000
MAIN PRACTICAL	6	4-5	30	100	600
MAIN PROJECT	1	4	4	100	100
ELECTIVE	4	3	12	100	400
COMPULSORY PAPER	1	2	2	100	100
Total	**23**	**-**	**90**	**-**	**2200**

THIRUVALLUVAR UNIVERSITY

M.Sc. INFORMATION TECHNOLOGY

SYLLABUS
UNDER CBCS
(with effect from 2017-2018)

SEMESTER I

PAPER – 1

PRINCIPLES OF COMMUNICATION SYSTEM

Objectives:

The aim of this course is to introduce the principles of communications, digital communications, and data communications.

UNIT-I

Spectral Analysis and Random Variable Process: Spectral characteristics of a periodic signal - Spectra of common signals related to communication - Cross correlation, auto correlation and power/energy density spectra - random signals and process - Modeling noises.

UNIT-II

Analog Modulation Systems: Basic principles of AM, FM, and PM - Spectra, power consideration, receiver's characteristics and deduction of AM, FM and PM systems performance - Threshold effects reduction.

UNIT-III

Base Band Data Communication: Sampling and quantizing - PCM, ADPCM, DM, ADM - Base band pulse shaping - Binary data formats - Base band transmission - ISI, correlative coding, optimum SNR - Matched filter deduction.

UNIT-IV

Digital Modulation: Digital modulation - Coherent binary modulation techniques - Coherent quadrature modulation techniques - Non-coherent binary modulation - M-array modulations - Performance of digital modulation systems based on probability of error, bandwidth, and ISI.

UNIT-V

Spread Spectrum Techniques: Fundamental concepts - Direct sequence spread spectrum - Frequency hopping spread spectrum.

Text Books:

Herbert Taub and Donald L Shilling, Principles of Communications Systems, 2nd edition, McGraw Hill Publishing, 2003
Simon Haykin, Principles of Communication, Prentice Hall of India, 1990.

References Books:

Thomas and Chandrasekar - communication Theory, 1st Edition year 2006, TMH, New Delhi.

Lathi B.P, Analog and Digital Communication Systems, Prentice Hall of India, 1992.

J.G. Proakis, Digital Communication, McGraw Hill, 4th edition, 1995.

Edward. A. Lee and David. G. Messerschmitt, Digital Communication, 3rd edition, 2003, Allied Publishers.

J Marvin.K.Simon, Sami. M. Hinedi and William. C. Lindsey, Digital Communication Techniques: Signal Design and Detection, 1994, Prentice Hall of India.

PAPER – 2

OBJECT ORIENTED PROGRAMMING

Objectives:

The main goal is to acquire skills and knowledge in Object oriented programming.

UNIT-I

C++ Programming : Introduction to C++ - Tokens, Expressions and Control Structures –Functions in C++ - Classes and Objects – Constructors – Destructors – Operator overloading and Type conversion

UNIT-II

Inheritance and Polymorphism: Inheritance – Multilevel Inheritance – Multiple Inheritance – Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Class – Abstract Class – Virtual Functions-File Stream Operations

UNIT-III

Java Programming : Importance and features of java, Data types, Expressions, Declarations, Statements and Control Structures, Program Structures, String handling, Packages, Interfaces, Working with java.util Package, Object Class.

UNIT-IV

Exception Handling, I/O and JDBC: Fundamental exception types, uncaught exceptions, throw, throw final, built in exception, creating our own exceptions.
Streams, Byte and Character stream, Predefined streams, Reading and Writing from Console and Files, Buffered Reader and Writer, Serialization.
JDBC Basics, JDBC Drivers, Connecting to Database and accessing databases.

UNIT-V

Interfaces, Packages and Threads :Interface – Extending Interface – Implementation Interfaces – Accessing Interface variables – Java API packages – Creating Packages –Accessing and using packages – Creating Threads – Extending the thread class – Stopping and blocking a thread – Thread priority - Synchronization

Text Books:

Balagurusamy E,"Object Oriented Programming ,2nd Edition, Tata Mcgraw Hill ,2001

Balagurusamy E, Programming with Java: A Primer, 3nd Edition, Tata Mcgraw Hill, 2007.

References Books:

Herbert Schildt, "C++ :The complete Reference", Tata McGraw Hill,1999.

Patrick Naughton and Herbert Schildt, Java-2 The complete Reference, 5th Edition, Tata McGraw Hill.

Bruce Eckel, Thinking in Java, 3rd Edition, Prentice Hall, 2000.

PAPER – 3

DATA BASE MANAGEMENT SYSTEM

Objectives:

The primary goal of this subject is to provide the complete knowledge on the object-oriented approach of databases. This serves the skill on Functional Dependencies, Normalization and data base design. It provides the complete set of administration tools on databases.

UNIT-I

Concepts For Object-Oriented Databases : Object Identity, Object Structure, and Type Constructors - Encapsulation of Operations, Methods, and Persistence - Type Hierarchies and Inheritance - Complex Objects - Other Object-Oriented Concepts - Object Databases Standards, Languages and Design - Overview of Object Model of ODMG - The Object Definition Language - The Object Query Language - Overview of C++ Language Binding - Object Database Conceptual Design - Overview of the CORBA standard for Distributed Objects - Object Relational and Extended Relational Database Systems: Evolution and Current Trends of Database Technology - The Informix Universal Server - Object Relational Features of Oracle 8 - An overview of SQL 3 - Implementation - Related Issues for Extended Type Systems - The Nested Relational Data Model.

UNIT-II

Functional Dependencies and Normalization for Relational Database: Informal Design Guidelines for Relational Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms - Boyce-Codd Normal Form - Relational Database Design and further Dependencies: Algorithms for Relational Database schema Design – Multi-valued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form - Inclusion Dependencies - Other Dependencies and Normal Forms - Practical Database Design and Tuning: The Role of Information Systems in Organizations - The Database Design Process - Physical Database Design in Relational Databases - An Overview of Database Tuning in Relational Systems - Automated Design Tools.

UNIT-III

Database System Architecture and The System Catalog: System Architectures For DBMS - Catalogs for Relational DBMS - System Catalog Information in Oracle - Other Catalog Information Accesses by DBMS software Modules - Data Dictionary and Data Repository Systems - Query Processing and Optimization: Translating SQL Queries into Relational Algebra - Basic Algorithms for Executing Query Operations - Using Heuristics in Query Optimization - Using Selectivity and Cost Estimates in Query Optimization - Query Optimization in Oracle - Semantic Query Optimization - Transaction Processing Concepts - Transaction and System Concepts - Desirable Properties of Transactions - Schedules and Recoverability - Serializability of Schedules - Transaction Support in SQL.

UNIT-IV

Concurrency Control Techniques: Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering – Multiversion Concurrency Control Techniques - Validation Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking - Using Locks for Concurrency Control in Indexes - Some other Concurrency Control Issues - Database Recovery Techniques: Recovery Concepts - Recovery Techniques Based On Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging - The ARIES Recovery Algorithms - Recovery In Multi-database Systems - Database Backup and Recovery From Catastrophic Failures - Database Security and Authorization: Database Security Issues - Discretionary Access Control Based on Granting/Revoking of Privileges - Mandatory Access Control for Multilevel Security - Statistical Database Security.

UNIT-V

Enhanced Data Models for Advanced Applications - Active Database Concepts - Temporal Database Concepts - Spatial and Multimedia Database - Distributed Databases and Client - Server Architecture - Distributed Database Concepts - Data Fragmentation, Replication and Allocation Techniques for Distributed Database Design - Types of Distributed Database Systems - Query Processing in Distributed Databases - Overview of Concurrency Control and Recovery in Distributed Databases - An overview of Client - Server Architecture and its Relationship to distributed Databases - Distributed Databases in Oracle-Future Prospects of Client-Server Technology - Deductive Databases - Introduction to Deductive Databases - Prolog/Datalog Notation - Interpretation of Rules .

Basic interface Mechanisms for Logic Programs - Datalog - Programs and their Evaluation - Deductive Database Systems - Deductive Object - Oriented Databases - Applications of Commercial Deductive Database Systems.

Text Books:

Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Addison - Wesley, 2000.

References Books:

Raghu Ramakrishnan, Johannes Gehrtee, “Database Management System”, Tata McGraw Hill, 2002.

Henry F.Korth & Abraham Silberschatz, “Database System Concepts”, McGraw, 1997.

Jeffrey D.Ullman, “Principles of Database Systems”, Galgotia Publishers, 1998.

ELECTIVE

PAPER – 1

A. COMPUTER ARCHITECTURE

Objectives:

To understand the main components of a computer system and the considerations in their design. To understand performance measures, as well as their impact on system architecture. To Understand the interplay among system components such as design trade-offs.

UNIT-I

Basic structure of computer hardware and software - Addressing methods and machine program sequencing - Computer arithmetic - logic design for fast adders - multiplication - Booth's algorithm - Fast multiplication - integer division - floating point number representation- floating point arithmetic.

UNIT-II

Control unit - instruction execution cycle - sequencing of control signals - hardwired control - PLAs - micro programmed control - control signals - microinstructions - micro program sequencing - Branch address modification - Prefetching of micro instructions - emulation - Bit slices.

UNIT-III

Memory organization-Semiconductor RAM memories- internal organization-Bipolar and MOS devices - Dynamic memories - multiple memory modules and interleaving - cache memories - mapping functions - replacement algorithms - virtual memory - address translations - page tables memory management units - Secondary memory - disk drives - organization and operations - different standards.

UNIT-IV

Input-output organizations - accessing I/ O devices - direct memory access (DMA) - interrupts - interrupt handling - handling multiple devices - device identification - vectored interrupts - interrupt nesting - Daisy chaining - I/ O interfaces - serial and parallel standards - buses - scheduling - bus arbitration - bus standards.

UNIT-V

Introduction to parallel organizations - multiple processor organization - symmetric multiprocessors - cache coherence - non uniform memory access - vector computation - introduction to CISC and RISC - Architectures - Comparison.

Text Books:

Hamacher C V, Computer Organization, 4th Edition, McGraw Hill, 1997.
Stallings William, Computer Organization and Architecture, 6th Edition, Pearson Education, 2003

References Books:

Pal Chaudhary P, Computer Organization and Design, Prentice Hall of India, 2004.
Hayes J P, Computer Organization and Architecture, 2nd Edition, Mc Graw Hill, 1998.
Tanenbaum A S, Structured Computer Organization, 6th Edition, Prentice Hall, 2006.
Kai Hwang and Faye A Briggs, Computer Architecture and Parallel Processing, Mc.Graw Hill, 1985.

PAPER – 1

B. DISCRETE MATHEMATICS

Objectives:

To understand the concepts of sets, proposition, permutation and combinations.
To familiarize in relations, digraphs and functions, trees, groups and coding.
To help the students for developing the fundamental mathematical knowledge.

UNIT-I

Fundamentals: Sets and subsets - Operations on Sets - Sequences - Division in the integers - Matrices - Mathematical structures.

Logic: Propositions and Logical operations - Conditional Statements - Methods of Proof - Mathematical Induction.
[
Counting: Permutations - Combinations - The Pigeonhole Principle - Elements of Probability - Recurrence Relations.

UNIT-II

Relations and Digraphs: Product Sets and Partitions - Relations and Digraphs - Paths in relations and Digraphs - Properties of relations - Equivalence Relations - Computer Representation of relations and Digraphs - Manipulation of Relations - Transitive Closure and Warshall's Algorithm.

UNIT-III

Functions: Functions - Permutation Functions - Growth of Functions Topics in Graph Theory: Graphs - Euler Paths and Circuits - Hamiltonian Paths and Circuits - Coloring Graphs

UNIT-IV

Order Relations and Structures: Partially Ordered Sets - External Elements of Partially Ordered Sets - Lattices - Finite Boolean Algebras - Functions on Boolean Algebras - Boolean Functions as Boolean Polynomials.
Trees: Trees - Labeled trees - Tree Searching - Undirected Trees - Minimal Spanning Trees.

UNIT-V

Semigroups and Groups: Binary Operations Revisited - semigroups - Products and Quotients of Semigroups - Groups - Products and Quotients of Groups. Groups and coding: Coding of Binary Information and Error Detection - Decoding and Error Correction

Text Books

Bernard Kolman.Robert C.Busby and Sharon Ross, " Discrete Mathematical Structures", Prentice Hall of India Pvt. Ltd., 1997.

References Books:

Lipschutz - Schaums Outline Series, "Discrete mathematics ", Special Indian Edition 2nd, 2006, TMH, New Delhi.

Veerarjan, "Discrete mathematics ", 1st Edition, 2006, TMH, New Delhi.

Trembley J.P. and Manohar R.P., "DISCRETE MATHEMATICAL STRUCTURES WITH APPLICATIONS TO COMPUTER SCIENCE", TataMcGraw - Hill, 1975

Korthage R.R., " DISCRETE COMPUTIONAL STRUCTURES", Academic Press, 1974.

Preparata, F.P., Yeh R.T., "INTRODUCTION TO DISCRETE STRUCTURES", Addison - Wesley, 1973.

PAPER - 1

C. OPERATING SYSTEM

Objectives:

To learn what an operating system is, what its role in a computing system is, how operating systems have evolved over time, and what the various components of an operating system are and how they work. Several real operating system case studies help to understand how the principles studied are used in practice. The role of an operating system in a distributed system is also to be studied.

UNIT-I

Introduction: Main frame Systems, Desktop Systems - Multiprocessor Systems - Distributed Systems - Clustered Systems - Real Time systems - Hand held Systems, Operating Systems Structures: System Components - Operating System Services - System calls - System Programs - System Design and Implementation - CPU scheduling: Basic Concepts - Scheduling Algorithms.

UNIT-II

Process Management: Process Concepts - Process Scheduling - Operation on Process - Co-Operating process - Inter Process Communication - Threads: Multithreading Models - Process Synchronization: The Critical Section Problem - Synchronization Hardware - Semaphores - classical problem of Synchronization - Monitors - Deadlock: Deadlock Characterization - Methods for handling Deadlocks - Deadlock Prevention - Deadlock Avoidance - Deadlock Detection - Recovery from Deadlock.

UNIT-III

Memory Management: Background - Swapping - Contiguous Memory Allocation - Paging - Segmentation - Segmentation with paging - Virtual Memory: Demand paging - Page Replacement - Thrashing.

UNIT-IV

File Systems: File Concepts - Access methods - Directory Structure - File Protection - File System Implementation: File System Structure and Implementation - Directory Implementation - Allocation methods Free Space Management - Recovery - Disk Structure - Disk Scheduling.

UNIT-V

Distributed Operating System : Design issues in distributed operating system -Distributed file systems - Naming and Transparency-Remote File Access -Stateful versus Stateless service - Distributed Coordination- Event Ordering -Mutual Exclusion - Atomicity - Concurrency Control - Deadlock Handling -Election Algorithms-Case Study-Linux and Windows.

Text Books:

Silberschatz, Galvin, Gagne, Operating System Concepts, 6th Edition, 2003.

Pradeep K.Sinha, Distributed OS concepts and Design, IEEE computer Society Press, PHI 1998.

References Books:

Dhamdhere - Operating System a Concept Based Approach, 2nd Edition, 2006, TMH, New Delhi.

Harris - Schaums Outlines of Operating Systems, 2005, TMH, New Delhi.

Andrew S. Tanenbaum, Modern Operating Systems, Prentice Hall of India, 2nd Edition 2001.

Achut S. Godbole and Kahate Atul, Operating Systems & Systems Programming, Tata Mcgraw Hill, 2003.

Charles Crowley, Operating systems: A Design Oriented Approach, Tata McGraw Hill, 1999.

CORE PRACTICAL – I

OBJECT ORIENTED PROGRAMMING LAB

Objectives:

The main aim is to familiarize the concepts learned in Object Oriented Programming. To write Programs for various object oriented concepts using C++ and Java.

Programs to implement

Function overloading in C++

Simple class design and objects creations in C++

Constructor and destructor in C++

Operator overloading, friend functions

Overloading assignment operator, type conversions

Inheritance and polymorphism in C++

Input/Output operation

Simple class design and objects creation in Java

String handling in Java

Control Structures in Java

Exceptions handling in Java

Java I/O

Multi-threaded programs in Java

Connecting to Database and accessing databases

CORE PRACTICAL – II

RDBMS LAB

Objectives:

To familiarize the concepts learned in RDBMS and to develop various practical applications using SQL and PL/SQL.

Excercises

Study of various SQL commands

Implementation of the concept of Normalization

Inventory control system with a reorder level

Student Mark sheet processing

Pay roll processing

Electricity bill preparation

Telephone Directory Maintenance

Bank Transactions

Library Information processing

Personal Information system

CORE PRACTICAL – III

VISUAL PROGRAMMING LAB

Objectives:

The students will acquire knowledge on software development using the visual programming languages. This course concentrates on the development of software systems in Visual Basic and Visual C++.

Visual Basic

Write a VB project that receives a year number from a text box and month name from list box and displays number of days in the given month. Take care of leap years. Use Lost Focus event for list box.

Write a VB project that stores 10 employee records with fields EMPNO, NAME, AGE, SEX and SALARY, in an array. Display data fields in text boxes and provide command buttons to move to desired record.

Write a VB project that receives a foreign currency value selected from a list box and converts it into equivalent Indian rupees. (e.g. USD 42.45, Sterling 71.30, D.Mark 25.52, SW Franc 31.58, SaudiRiyal 11.40, French Franc 7.60, UAE Dhiram 11.55, Kuwait Dhinar 140.56)
[[
Write a VB project using control array that creates a scientific calculator with appropriate command buttons. Include the following capabilities for the calculator: +, -, *, /, %, power, square root, square and log (base 10).

Write a VB project to create a screen saver that displays a list of pictures with 1 second pause in between succesive pictures.

Write a VB project for commercial bank operations using SB account database, with the following features:

1. ADD NEW ACCOUNT
2. DEPOSIT AMOUNT
3. WITHDRAW AMOUNT (with minimum balance condition)
4. Calculate simple interest and update balance taking average of last 6 month balance in the account.
5. CLOSE ACCOUNT.

Write a VB project using built in Ax control (Rich Text Box), develop the windows NOTEPAD like editor with File and Edit menus and also display the floating menu whenever necessary.

Write a VB project for a Blood Bank that maintains a list of donors with address and their blood group. Provide the following reporting features:
i) Search and display the address of a particular donor, given the name in a text box.
ii) Display all the donors (using data report)
a) in age group 20-30.
b) in particular city.
c) with particular blood group.
d) male donors with particular blood group
e) female donors with particular blood group.

Write a VB project using Ax DLL or EXE add a class module that would perform the following functions:

a) Test whether the given number is perfect or not
b) Whether the gn% number Armstrong or not
c) Find the factorial of the given number
d) sum of digits

Write a VB project using Activex X control to create a Textbox that accepts only numeric value. Provide the following properties for the text box: BackColor, Forecolor and Text.

Visual C++

Write Visual C++ win32 application program using MFC that creates a new font.
Write Visual C++ win32 application program using MFC that displays a message "Hello Good Morning!" wherever the user clicks the mouse button on the client area.
Write Visual C++ win32 application program using MFC that allows the user to draw pictures with the help of mouse as a free hand drawing tool.
Write Visual C++ win32 application program using MFC that creates a list box and displays name of the states in India.
Write Visual C++ win32 application program using MFC that displays line, rectangle, rounded rectangle, ellipse and polygon filled with colors.
Write Visual C++ win32 application program using MFC that fills the background of the client area with a bitmap.
Write Visual C++ win32 application program using MFC that displays a menu. Choose the menu items using keyboard accelerator keys and display appropriate messages for the selected command, in message box.
Write Visual C++ win32 application program using MFC that displays the status of ALT, CTRL, SHIFT, NUM LOCK and SCROLL LOCK keys.
Write Visual C++ win32 application program using MFC that displays current mouse coordinates in status bar.
Write Visual C++ win32 application program using MFC that creates two push buttons OK and CANCEL on the client area. Buttons should respond to user click over them and display appropriate message.

SEMESTER - II

PAPER – 4

VISUAL PROGRAMMING

Objectives:

To learn and understand Windows, Visual Basic and Visual C++ Programming

UNIT-I

Introduction to windows Programming – Event Driven Programming – Data Types – Resources – windows Message – Device context – Document Interfaces – Dynamic Linking Libraries – Software Development Kit (SDK) tools – Context help

UNIT-II

Visual Basic Program – Form Design – VBX control – Properties – Event procedures – Menus and Toolbars – Using Dialog Boxes – Working with control Arrays – Active X controls – Multiple Document Interface (MDI) – File System Controls – Data Control – Database Applications

UNIT-III

Visual C++ Programming – Frame work classes – VC++ Components - Resources – Event Handling – Message Dispatch system – Model and Modeless Dialogs – Important VBX Controls – Document view architecture – serialization – Multiple Document Interface – splitter windows – Coordination between controls.

UNIT-IV

Database Connectivity – Embedding Controls in view – Creating user defined DLL s – Dialog based applications – Dynamic data transfer functions – Database management with ODBC – communicating with other applications – Object linking and embedding.

UNIT-V

Basics of GUI Design – Visual Interface Design – File System – Storage and Retrieval System

Text Books:

Petzold,"Windows Programming", Microsoft Press 1995.
Marion Cottingham,"Visual Basic",Peachpit Press,1999.
Kate Gregory,"Using Visual C++",Prentice Hall of India,1999.

References Books:

Pappar and Murray,"Visual C++: The Complete Reference", Tata McGraw Hill,2000.

PAPER – 5

COMPUTER NETWORKS

Objectives:

Understand the basics of Computer Networks. Understand the operation of the protocols that are used Computer Networks.

UNIT-I

Introduction : Applications of Computer Network - Hardware and Software - Protocol Hierarchies - Design Issues of the layers - Interfaces and services - Service Primitives - Reference Models : The OSI Reference model-The TCP/IP Reference Model -Types of computer Network : LAN,MAN,WAN-Topologies - Transmission Media - Concept of data transmission - Switching Techniques - ISDN and ATM.

UNIT-II

Data Link Layer: Data Link Layer design issues - Framing - Flow control - Error Detection and Correction – Data link protocols: Stop and Wait Protocol - Sliding window protocol - Medium access sub layer: Channel allocation –static and dynamic - Multiple access protocol – FDDI - Data Link Layer in the Internet – SLIP - PPP.

UNIT-III

Network Layer : The Network Layer Design Issues - comparison of virtual circuits and datagram subnets - connectionless internetworking - Internetwork routing - Routing algorithms – Fragmentation - The Network Layer in the Internet – The IP Protocol - IP Address - subnets - Internet control protocols - internet multicasting.

UNIT-IV

Transport Layer : The Transport layer services - The concept of client and server in terms of socket addressing - Quality of service - Transport service primitives and buffering – Multiplexing - Crash Recovery - The Internet Transport Protocols (TCP/IP) – The TCP protocol, The TCP segment header, TCP connection management - TCP transmission policy - TCP congestion control - UDP.

UNIT-V

Presentation and Application Layer : Network Security – Traditional Cryptography - Two fundamental Cryptographic Principles – Symmetric and Asymmetric Key Algorithms - DNS - SNMP -E-mail.

Text Books:

Computer Networks," Andrew .S. Tanenbaum", Prentice Hall of India, 2003

References Books:

Forouzan: Data Communication and Networking, Special Indian Edition 4th Edition 2006, TMH, New Delhi.

Shashi Banzal ,"Data and Computer Network Communication",Firewall Media,2007.

J.F Kurose and K.W. Ross, Computer Networking - A top-down approach featuring the internet, Addison Wesley, 2001.

William Stallings, Data & Computer Communication, 6th Edition, Pearson Education, 2002.

Mani Subramanian, Network Management: Principles and Practice, Addison Wesley, 2000.

ELECTIVE

PAPER – 2

A. SOFTWARE ENGINEERING

Objectives:

The objective of this subject is to make the student familiar with the principles, management and practical methodology followed in any software engineering project development, its implementation and maintenance.

UNIT-I

Software characteristics - Software Engineering Layers - Software Process - Process Models - Linear Sequential, Evolutionary and Formal Methods - Software Measurement Size Oriented, Function Oriented, Extended Function Point Metrics, Metrics for quality.

UNIT-II

Software Project Planning - Software Scope, Resources - Project Estimation - Problem Based, LOC Based, Process Based Estimation - Estimation Models - COCOMO Model - Software Quality - Quality Assurance - Software Reviews - Formal Technical Reviews - Statistical Quality Assurance - Software Reliability - SQA Plan.

UNIT-III

Software Requirement Analysis - Communication Techniques - Analysis Principles - Software Prototyping - Specification - Software Design Concepts - Effective Modular Design - Cohesion - Coupling - Design Documentation - Real Time and Design Methods - Data, Architecture, Transform and Transaction Mapping, Interface and Procedural Design.

UNIT-IV

Object Oriented Software Engineering - Concepts Identifying the Elements of Object Model - Object Oriented Analysis - Domain Analysis - Object Relationship and Behavior Model Design for Object Oriented Systems - System Design Process - Testing Strategies - Test Case Design and Testing Methods - Metrics for Object Oriented Systems - Class Oriented Metrics - Operation Oriented Metrics - Metrics For Object Oriented Testing and Projects.

UNIT-V

Software Testing - Fundamentals White Box, Black Box, Control Structure Testing - Testing on Specialized Environments, Unit, Integration, Validation, System Testing - Art of Debugging - Software

Reengineering - Software Maintenance - Process Model - Reverse Engineering - Forward Engineering - CASE - Building Blocks 0 - Taxonomy I - CASE - Integration Architecture - CASE Repository

Text Books:

Rogger S.Pressman, "Software Engineering - A Practioners Approach" McGraw Hill Companies Inc, 1998.

References Books:

Pressman - Software Engineering a Practitioner approach, 6th Edition 2006, TMH, New Delhi.

Ian sommerville, "Software Engineering" Addison Wesley, Fifth Edition, 1986.

Carlo Ghezzi, Mehdi Jazayasi, Dino Mandrioloi, "Fundamentals of Software Engineering" PHI Pvt.Ltd., 1991.

Richard.E.Fairley,"Software Engineering Concepts", Tata McGraw Hill, First Edition, 1985.

PAPER – 2

B. E- COMMERCE

Objectives:

By the end of the course the student should have :
A background in electronic commerce as it affects small and medium sized business (SMEs)
An understanding of how you can develop and implement anE-commerce strategy for your business
An E-commerce business plan based on the adoption of a selected E-commerce strategy.

UNIT-I

Introduction: Infrastructure for Electronic Commerce - Networks - Packet Switched Networks - TCP/IP Internet protocol - Domain name Services - Web Service Protocols - Internet applications - Utility programs - Markup Languages - Web Clients and Servers - Intranets and Extranets - Virtual private Network.

UNIT-II

Core Technology: Electronic Commerce Models - Shopping Cart Technology - Data Mining - Intelligent Agents - Internet Marketing - XML and E-Commerce

UNIT-III

Electronic Payment Systems: Real world Payment Systems - Electronic Funds Transfer - Digital Payment -Internet Payment Systems - Micro Payments - Credit Card Transactions - Case Studies.

UNIT-IV

Security: Threats to Network Security - Public Key Cryptography - Secured Sockets Layer - Secure Electronic Transaction - Network Security Solutions - Firewalls.

UNIT-V

Inter/Intra Organizations Electronic Commerce: EDI - EDI application in business - legal, Security and Privacy issues - EDI and Electronic commerce - Standards - Internal Information Systems - Macro forces - Internal commerce - Workflow Automation and Coordination - Customization and Internal commerce - Supply chain Management.

Text Book:

Ravi Kalakota and Andrew B Whinston, Frontiers of Electronic commerce, Addison Wesley, 1996

Reference Books:

Baskar - E-Commerce Framework Technologies and Applications 2nd Edition, 2006, TMH, New Delhi.

Pete Loshin, Paul A Murphy, Electronic Commerce, 2nd Edition, Jaico Publishers1996.

David Whiteley, e - Commerce: Strategy, Technologies and Applications, McGraw Hill, 2000.

PAPER – 2

C. TELECOMMUNICATION SWITCHING TECHNIQUES

Objectives:

The objective of the course is to impart theoretical and practical knowledge of the present day telecommunication switching systems and data networks. Topics ranging from the electromechanical switching systems to the voice and data integration systems will be covered. Design of space and time division switching systems will be discussed. The course also deals with data and ATM networks.

UNIT-I

Evolution of Telecommunication Switching And Circuit: Evolution of Public Switched Telecommunication Networks Strowger exchange, Crossbar exchange, Stored program exchange Digital exchange - Basic Tele communication equipment - Telephone handset, Hybrid circuit, Echo suppressors and cancellers, PCM coders, Modems and Relays.

UNIT-II

Electronic Switching: Circuit Switching, Message switching, Centralized stored program switching, Time switching, Spare switching, Combination switching - Digital switching system hardware configuration, Switching system software, Organization, Switching system call processing software, Hardware software integration.

UNIT-III

Telecommunication Signaling and Traffic: Channel associated signaling, Common channel signaling, SS7 signaling protocol, SS7 protocol architecture, Concept of Telecommunication traffic, Grade of service, Modeling switching systems, Blocking models and Delay systems.

UNIT-IV

Integrated Digital Networks: Subscriber loop characteristics, Local access wire line and wire less PCM / TDM carrier standards transmission line codes, Digital multiplexing techniques, Synchronous, Asynchronous, Plesiocronous multiplexing techniques, SONET/ SDH, Integrated Digital Network (IDN) environment - Principles of Integrated Services Digital Network (ISDN) - Cellular Mobile Communication Principles.

UNIT-V

Data Net Works: Data transmission in PSTN - Connection oriented and Connection less protocols - packet switching - ISO-OSI architecture-Satellite based data networks - Multiple access techniques - LAN, WAN - standards - TCP / IP - Internet - Principle of ATM networks.

Text Book:

Viswanathan T, Telecommunication Switching System and Networks, Prentice Hall of India, 1994.

References Books:

Ali,"Digital Switching System Reliability and Analysis", 1st Edition 2005, TMH, New Delhi.

Behrouz Forouzan, "Introduction to Data Communication and Networking", McGraw - Hill, 1998.

L.S.Lawton, "Integrated Digital Networks", Galgotia Publication, New Delhi, 1996.

SEMESTER III

PAPER – 6

INTERNET PROGRAMMING

Objectives:

Upon completion of the course the student will be able to:
Write client-side JavaScript programs for executing in a Web browser.
Do basic HTML design using colors, images, tables, frames, and GUI components such as text boxes, buttons, menus, checkboxes, and radio buttons and develop interactive Web applications that integrate HTML with JavaScript using event handlers.
Explain control structures, functions, and arrays, and illustrate how they are used to create JavaScript programs. Also discuss object-oriented programming and the Document Object Model, built-in and custom objects.
Create JavaScript applications that use cookies to track and save Web preferences.

UNIT-I

Introduction: Introduction to the Internet and World Wide Web - World Wide Web Consortium (W3C) - History of the Internet History of the World Wide Web - History of SGML -XML Introduction to HyperText Markup Language - Editing HTML - Common Elements - Headers - Linking - Images - Unordered Lists - Nested and Ordered Lists - HTML Tables-Basic HTML Forms

UNIT-II

Dynamic HTML: Dynamic HTML Object Model and Collections, Event Model, Filters and Transitions, Data Binding with Tabular Data Control, Dynamic HTML-Structured Graphics ActiveX Controls, Dynamic HTML-Path, Sequencer and Sprite ActiveX Controls.

UNIT-III

JavaScript: JavaScript, Introduction to Scripting, Control Statements, Functions, Arrays, Objects.

UNIT-IV

XML: Creating Markup with XML -Parsers and Well-formed XML Documents -Parsing an XML Document with msxml - Document Type Definition (DTD) - Document Type Declaration - Element Type Declarations - Attribute Declarations - Document Object Model - DOM Implementations - DOM Components - path - XSL: Extensible Stylesheet Language Transformations (XSLT)

UNIT-V

PERL, CGI AND PHP: Perl - String Processing and Regular Expressions - Form Processing and Business Logic - Server-Side Includes - Verifying a Username and Password - Using DBI to Connect to a Database - PHP - Form Processing and Business Logic - Connecting to a Database - Dynamic Content in PHP

Text Books:

Deitel & Deitel, Internet & World Wide Web How to Program, 3rd Edition, Pearson Education India, 2004.

Deitel & Deitel, XML How to Program, Pearson Education, 2001.

References Books:

God bole - Web Technologies, TCP/IP to Internet Application Architectures, 1st Edition - 2005, TMH, New Delhi.

Negrino and Smith, Javascript for the World Wide Web, 5th Edition, Peachpit Press 2003.

Deitel & Deitel, Perl How to Program, Pearson Education, 2001.

Benoit Marchal, XML by Example, 2nd Edition, Que/Sams 2002.

PAPER – 7

MOBILE COMPUTING

Objectives:

The objective is to provide the concepts of mobile computing including access control, digital mobile phone system, wireless LAN and the necessary protocols.

UNIT-I

INTRODUCTION : Mobile and Wireless Devices – Simplified Reference Model – Need for Mobile Computing – Wireless Transmissions – Multiplexing – Spread Spectrum and Cellular Systems – Medium Access Control – Comparisons.

UNIT-II

TELECOMMUNICATION SYSTEMS: Telecommunication Systems – GSM – Architecture – Sessions – Protocols – Hand Over and Security – UMTS and IMT-2000 – Satellite Systems.

UNIT-III

WIRELESS LAN : IEEE 802.11 – Hiper LAN – Bluetooth – MAC layer – Security and Link Management.

UNIT-IV

MOBILE IP : Goals – Packet Delivery – Strategies – Registration – Tunneling and Reverse Tunneling – Adhoc Networks – Routing Strategies.

UNIT-V

WIRELESS APPLICATION PROTOCOL : Wireless Application Protocol (WAP) – Architecture – XML – WML Script – Applications.

Text Book:

Jochen Schiller, "Mobile Communications", Pearson Education, Delhi, 2000.

References Books:

Sandeep Singhal, Thomas Bridgman, Lalitha Suryanarayana, Danil Mouney, Jari Alvinen, David Bevis, Jim Chan and Stetan Hild, "The Wireless Application Protocol : Writing Applications for the Mobile Internet", Pearson Education Asia, 2001

PAPER – 8

COMPUTER GRAPHICS AND MULTIMEDIA

Objectives:

The objective is to provide complete understanding of the theoretical aspects of computer graphics and multimedia. To provide the details of algorithms which facilitate implementation of both 2D and 3D graphics. To provide a basic understanding of the fundamental issues and problems in the representation and manipulation of multimedia content such as images, audio and video.

UNIT-I

Introduction and Hardware: Representative uses of computer graphics - vector display and raster display architectures - display processor - interactive input devices - output primitives - software portability and graphics standards - conceptual framework for interactive graphics.

UNIT-II

2D graphics: Basic raster graphic algorithms for 2D primitives - scan converting lines - circles - ellipses - filling rectangle - character generation - 2D transformations - 2D clipping - windowing transformation.

UNIT-III

3D graphics: 3D representation methods - 3D transformations - viewing and projections - parallel and perspective projections - hidden line elimination - hidden surface elimination.

UNIT-IV

Introduction: Elements of multimedia systems - Multimedia Hardware - Storage for Multimedia - Input, Output and Communication devices.

UNIT-V

Multimedia Building Blocks: Text - Images - Animation – Audio – Video – Animation – Image editing tools - Painting and drawing tools - Sound editing programs - Video formats - Presentation tools - Authoring tools.

Text Books:

Foley, Van Dam, Reiner, Aughes, “Computer graphics Principles and Practice”, Addision Wesley, 1997.

Hearn and Baker, “Computer graphics”, PHI, Ltd., 1995.

Tay Vaughan, Multimedia - Making it Works, 2nd Edition, McGraw Hill, 1997.

Judith Jeffcoate, Multimedia In Practice - Technology and Applications, Prentice Hall of India, 1995.

References Books:

Plastock, ” Computer Graphics ”, 2nd Edition , 2006, TMH, New Delhi.

William M.Neuman, Robert Sproull, “Principles of interactive computer graphics”, Second edition, McGraw Hill, 1989

Steven Harrington, “Computer graphics - A Programming Approach”, McGraw Hill, 1987.

Parekh,” Principles of Multimedia”, 2006, TMH, New Delhi.

Tay Vaughan, ”Multimedia making it work ”, 7th Edition , 2007, TMH, New Delhi.

ELECTIVE

PAPER – 3

A. JSP AND EJB

Objectives:

To provide complete skills on Internet programming paradigm and also programming knowledge about J2EE such as JSP and EJB.

UNIT-I

Introduction : J2EE-JSP Basics-Elements – Directives –Scripting Elements – Web Application Server Architecture – Important Servlet API features –Introduction to JSP and Java Beans – JDBC
JSP session – persistent connections – cookies and Java sessions – HTTPS and SSL

UNIT-II

Error Handling and Debugging: JSP Error Handling – types – JSP specific Exception classes - handling different types of errors – Debugging techniques.
Database connectivity – RDBMS - Driver types – coding with JSP and JDBC

UNIT-III

Tag extensions and libraries –simple tags – implementation of Body tag interface – Dynamic GUI – creation of web sites – co-branded model –web portal

UNIT-IV

Introduction – transaction process – Benefits and models of transaction – 2 tier architecture – 3 tier architecture – server side component architecture- distributed transaction processing – The Java 2 Platform Enterprise Edition – Enterprise Bean – type of bean – Logical architecture – EJB - design and implementation of a bean

UNIT-V

Session beans – Enterprise Bean class – Life cycle – Stateful Session Bean Example – Stateless Session Bean Example –session context – EJB Security

Entity Beans – Persistence concept - Definition and features of Entity Beans – Developing and using Entity Beans- Entity context – Life cycle of Entity Beans – container – managed persistence Bean – Debugging problems

Text Books:

Karl Avedal, Danny Ayers et. Al.,"Professional JSP ",Wrox Press, May 2000

Simon Brown,Robert Burdick,Danko Coker , Professional JSP ",Wrox Press, May 2001

Richard Monson Haefel, "Enterprise Java Beans ",O'Reilly,Shroff Publishers and Distributers Pvt. Ltd.,January 2001

References Books:

Wrox Author Team,"Professional EJB ",Wrox Press, July 2001

PAPER – 3

B. CLIENT SERVER COMPUTING

Objectives:

To familiarize the concepts of client/server computing and its characteristics and the Role of client and server components.

UNIT-I

Basic concepts of Client / Server – Upsizing Down sizing – Right sizing – Characteristics – File servers – Database servers – Transactions servers – Groupware servers – Object
Client/Servers – Web Servers – Middleware.
Client / Server building blocks – Operating System services – Base services – External services – server scalability – Remote procedure calls – Multiservers.

UNIT-II

SQL Database servers – server architecture – Multithread architecture – Hybrid architecture – stored Procedures – Triggers – Rules – Client / Server Transaction Processing – Transaction models – Chained and nested transactions – Transaction processing monitors – Transaction Management Standards.

UNIT-III

Database Connectivity solutions : ODBC – The need for Database connectivity – Design overview of ODBC – Architecture – components – Applications – Driver Managers – Drivers – Data sources – ODBC 2.5 and ODBC 3.0.

UNIT-IV

Visual C++: The Windows Programming Model – GDI – resource based programming – DLL and OLE Applications – Visual C++ components – frame work / MFC class Library – basic event handling – SDI – Appwizard – ClassWizard – Model and Models dialogues – other controls – Examples.

UNIT-V

Multiple Document Interface – Data Management with Microsoft ODBC – OLE client – OLE server – Client / Server Data Exchange format – Dynamic Data Exchange.

Text Books:

Robert Orfali, Dan Harkey and Jerri Edwards, Essential Client / Server Survial Guide, John Wiley and sons Inc. 1996.

David J. Kruglinski, Inside Visual C++, Microsoft Press 1992.

References Books:

Bvar, B.H., Implementing Client / Server Computing : A Strategic Prospective, McGraw Hill, 1993.

Bruce Elbert, Client / Server Computing, Artech Press, 1994.

Alex Berson, Client / Server Architecture, McGraw Hill, 1996.

PAPER – 3

C. IMAGE PROCESSING

Objectives:

To familiarize the concepts of Image Processing and its Applications

UNIT-I

Introduction : Image perception – light, luminance, brightness and contrast – Monochrome vision models – Image fidelity criteria – color representation. Digital image sampling and quantization –Basic relationship between pixels

UNIT-II

Image enhancement : point operations – contrast stretching, clipping and thresholding – Histogram modeling – Spatial operations – averaging and low pass filtering, smoothing filter, sharpening filter and median filtering - Image Enhancement in frequency domain – smoothing and sharpening filters – Homomorphic filter

UNIT-III

Image restoration : Image observation models – Inverse and wiener filtering – Least square filters – Image analysis – Edge detection – Boundary extraction – Boundary representation – Region representation – Image segmentation – Classification techniques – Image understandings.

UNIT-IV

Image data compression : Redundancies – Image compression models – Error free compression – Lossy compression - Entropy coding, Run length, Bit plane – Predictive techniques – Delta modulation - DCPM

UNIT-V

Morphological Image Processing : Introduction – Dilation – Erosion – Opening –Closing – Morphological Algorithm operations on binary and Gray scale images
Image Representation and Description : Representation Schemes – Boundary Descriptors – Regional Descriptors

Text Books:

Gonsalez and Woods, “Digital Image Processing”, second Edition, Pearson Education,2002.

Anil K.Jain, “Fundamentals of digital image processing”, Prentice Hall information and System Science series, 1989.

References Books:

Pratt W.K. ,“Digital Image Processing”, 2nd Edition, John Wiley & Sons, 1991.

Rosenfied A. & Kak, A.C., “Digital Picture Processing”, Vol. I & II, Academic press, 1982.

Nick Efford – Digital Image Processing: A Practical introduction using Java – Addison Wesley / Benjamin Cummings, 2000.

CORE PRACTICAL – IV

NETWORK LAB

Objectives:

To familiarize the concepts learned in Computer Network. Programs for various Network functions can be written using Java.

Network Programming

Retrieving data with URLs

Implementation of Socket Programming

Using TCP/IP

Using UDP

Implementation of FTP

Implementation of ECHO/PING/TALK

Implementation of Remote command Execution

Implementation of ARP

Implementation of RARP

Implementation of RMI / RPC

Implementation of Shortest Path Routing Algorithm

Implementation of Sliding Window Protocol

CORE PRACTICAL – V

INTERNET PROGRAMMING LAB

Objectives:

To implement the concept learned in internet programming and make familiarize with the creation of web based applications.

Creating a web page with cascading style sheets and Embedded style sheets.

Create a web page with the following.

Order form using HTML form elements

Validate the details in client side by using Java script

Design a web page to perform screen saver animations using Java script

Design a web page to display the text file contents using data binding concepts in DHTML.

Design a HTML Editor using Java applet.

Design a web page for library Management using Java applet and JDBC.

Write a Java RMI program to copy a text file from server to client.

Design a web page to conduct On-line Quiz using Java server pages.

Write a servlet program to do the following.

Set the URL of another server.

Display the header details during request of a page.

Display response header as well as contents during response from the server.

Design a web page to demonstrate session tracking Management using Java servlet.

CORE PRACTICAL – V

GRAPHICS AND MULTIMEDIA LAB

ObjectiveS:

To make the students to understand practically various concepts learned in Computer graphics and Multimedia.

Program for Line drawing using Bresenham, DDA Line Drawing Algorithms.

Program for Circle Drawing using Bresenham Circle Drawing Algorithms.

Program for Clipping Algorithm using Line Clipping

Program for 2D Transformations like Translations and Scaling and Rotations.

Program for 3D Transformations like Translations and Scaling and Rotations.

Performing various editing operations on an Image

Creating different Animations.

SEMESTER IV

PAPER – 9

SOFTWARE PROJECT MANAGEMENT

Objectives:

The goal of the course is to study about Software Process, Project Estimation, Project Scheduling and Quality Standards

UNIT-I

Introduction – Product Life – Project life cycle models - water fall model – Prototyping model – RAD model – Spiral Model – Process Models – Metrics.

UNIT-II

Software Configuration Management – Definitions and terminology – processes and activities – Configuration audit – Matrics – Software Quality assurance – definitions – quality control and assurance – SQA Tools – Organisation of Structures – Risk Management – Risk Identification, quantification Monitoring – Mitigation.

UNIT-III

Project initiation – Project Planning and tracking – what, cost, when and how – organisational processes – assigning resources – project tracking – project closure – when and how.

UNIT-IV

Software requirements gathering – steps to be followed – skills sets required – challenges – matrics – Estimation 3 phases of estimation – formal models for size estimation – translating size estimate to effort schedule estimate, matrics – Design and Development phases – reusability, Technology choices, Standards, Portability user interface – testability – iagonosability etc.

UNIT-V

Project Management in testing phase – in the maintenance phase – Impact on internet on project Management.

Text Books:

1. Gopalaswamy Ramesh, “Managing Globle Software Projects” Tata McGraw Hill Publishing Company Ltd, New Delhi, 2002

References Books:

Bob Hughes and Mike Cotterell “Software Project Management”2nd edition, Tata McGraw Hill Publishing Company Ltd., New Delhi, 2002.

PAPER – 10

NETWORK SECURITY

Objectives:

The goal of the course is to provide students with a foundation allowing them to identify, analyze, and perhaps solve network-related security problems in computer systems. The course covers fundamentals of number theory, authentication, and encryption technologies, as well as the practical problems that have to be solved in order to make those technologies workable in a networked environment, in particular in the wide-area Internet environment.

UNIT-I

Introduction: Attacks - Services - Mechanisms - Conventional Encryption - Classical and Modern Techniques - Encryption Algorithms - Confidentiality.

UNIT-II

Public Key Encryption: RSA - Elliptic Curve Cryptography - Number Theory Concepts.

UNIT-III

Message Authentication: Hash Functions - Digest Functions - Digital Signatures - Authentication Protocols.

UNIT-IV

Network Security Practice: Authentication, Applications - Electronic Mail Security - IP Security - Web Security.

UNIT-V

System Security: Intruders - Viruses - Worms - Firewalls Design Principles - Trusted Systems.

Text Books:

William Stallings, Cryptography and Network Security: Principles & Practice, Prentice Hall, 3rd Edition, 2002.

References Books:

Kahate - Crytography and Networks Security - 1st Edition 2005, TMH, New Delhi.

Bruce, Schneier, Applied Cryptography, 2nd Edition, Wiley & Sons, 1996.

Man Young Rhee, Internet Security, Wiley, 2003.

Pfleeger and Pfleeger, Security in Computing, Pearson Education, 3rd Edition, 2003.

ELECTIVE

PAPER – 4

A. HIGH SPEED NETWORKS

UNIT-I

HIGH SPEED NETWORKS : Fast Ethernet technology, FDDI, SONET and SDh standards, Performance of HIGH speed LAN- throughput, delay and reliability. Wave length division multiplexed LANrouting and switching MDM networks, Gigabit LAN.

UNIT-II

ISDN and STANDARDS : Overview of ISDN – user interface, architecture and standards. Packet switched call over ISDN, B and D channels, link access procedure (LAPD) ISDN layered architecture, signaling. Limitations of Narrowband ISDN (N-ISDN) and evolution of broad band ISDN (B-ISDN).

UNIT-III

ASYNCHRONOUS TRANSFER MODE NETWORKS : ATM protocol architecture, ATM adaption layer, fast packet switching techniques and VP/VC encapsulation. ATM cells, ATM cell header interpretation, source characteristics.

UNIT-IV

ATM TRAFFIC MANAGEMENT : Traffic management issues in ATM-resource management, connection management, policing and reactive control principles. Discrete time queue analysis and application to CAC, leaky bucket and ECN/ICN.

UNIT-V

ATM SIGNALING AND DATA COMMUNICATION OVER ATM : ATM signaling fundamentals and meta-signaling. TCP/IP over ATM-challengers and proposal LAN emulation over ATM. Performance of Data Communication over ATM.

Text Books:

1. Onvural.R.O., “Asynchronous Transfer Mode Networks”, Performance Issues, Artech House, 1995.
2. Stallings.W., “High Speed Networks, TCP-IP and ATM design Principles”, Prentice Hall of India, Delhi, 1998.

References Books:

1. Craig Patridge, “Gigaabit Networking”, Addision Wesley, 1997.
2. Stallings W,”ISDN with frame relay and ATM”, P.H.International, 1995

PAPER – 4

B. OPTICAL AND SATELLITE COMMUNICATION

Objectives:

This course is devoted to the analysis and design of a general optical and satellite communication link. Students will understand hardware and performance capabilities and limitations of modern optical and satellite communications.

UNIT-I

Optical Fibers, Sources and Detector: Structure, wave guiding and characteristic modes and configuration, group velocity, dispersion, mode coupling, single mode fiber design – Laser Diodes, light emitting diodes, modal, partition and reflection noise, power coupling, splicing, connectors, PIN – Diode, avalanche photo-diodes. Detector response time.

UNIT-II

Receiver Operation: Probability of error, quantum, limit, receiver sensitivity calculation, performance curves, preamplifiers, light speed circuits, power budget, rise-time budget, line coding, eyr-pattern.

UNIT-III

Communication Satellite – Orbit and Description: Orbital period and velocity, effects of orbital inclination, coverage angle and slantrange, placement of satellite in a geo-stationary orbit, Satellite description – Communication subsystems, telemetry, command and ranging subsystems, attitude control and electrical power.

UNIT-IV

Earth Station: Earth station antenna types, gain and radiated power, pointing loss, noise temperature, G/T ratio, high power amplifiers, redundancy configurations, carrier and power combining, low noise amplifiers – redundancy configuration and non-linearity, up converter and down converter – conversion process, hopping and redundancy configurations.

UNIT-V

Applications and Services: Satellite packet communications – ALHOA, slotted ALOHA and packet reservation. Very small aperture terminal (VSAT) networks – technologies and configurations. Mobile satellite (MSAT) networks – Operating environment, low orbital satellites, Iridium satellites.

Text Books:

Gowar J, Optical Communication Systems, Prentice Hall, 1993.

Rody D, Satellite Communication, Prentice Hall, 1989.

Reference Books:

Selvarajan , " Optical fiber Communications Principles and Systems", 1st Edition, 2005, TMH, New Delhi.

Senior J, "Optical Communication-Principles and Practice", Prentice Hall, 1994.

Bharghava et. Al., "Digital Communication by Satellite", Prentice Hall, 1992.

Ha T, 'Satellite Communications ', McGraw Hill, 1996.

PAPER – 4

C. COMPONENT TECHNOLOGY

Objectives:

Aim of this course is to provide the concepts of distributed objects and computing methodologies and CORBA

UNIT-I

INTRODUCTION : Objects – distributed objects – Historical perspective on Distributed objects and computing methodologies.

UNIT-II

CORBA : Architecture – Interface Definition Language – Static and dynamic method invocation- Interface Repository – Basic Object adapter – Services.

UNIT-III

DEVELOPMENT OF A CORBA APPLICATION : Client applet – Server – IDL contract – Database interface.

UNIT-IV

DCOM : Model and services – Objects and Object hierarchies – Location transparency – Configuration information – interface definition language (MIDL) – Applications.

UNIT-V

CURRENT ISSUES : Internet Inter Orb Protocol – CORBA – DCOM interoperability issues – CORBA facilities – CORBA domains – CORBA migration process – Other distributed object paradigms.

Text Books:

Mowbray, T.J. and Ruh, W.A., “Inside CORBA”, Addition Wesley, 1997.

References Books:

Orfali, R. and Harkey, D. "Client / Server Programming with Java and CORBA", 2nd Edition, John Wiley and Sons, 1999.

Henning, M. and Vnonki, S. "Advanced CORBA Programming with C++", Addison Wesley, 1999.

Slama, Garbis and Russel, "Enterprise CORBA", Addison Wesley, 1999.

Redmond, F.E., "DCOM: Microsoft Distributed Component Object Model", IDG Books Worldwide Inc., 1997.

Sessions, R., "COM and DCOM", John Wiley and Sons, 1998.

Thai, T.I. "Learning DCOM", O'Reilly, 1999.

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