## UNIVERSITY DEPARTMENTS
### ANNA UNIVERSITY  :  :  : CHENNAI 600 025
### REGULATIONS - 2010
### M.Sc. (INFORMATION TECHNOLOGY)
### FIVE YEAR INTEGRATED PROGRAMME

#### Semester I

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LEARNING OBJECTIVES

- To develop the four basic skills of language (reading, writing, speaking and listening) in order to acquire a creative and analytical mind that would fit into this new age of technological and global communication.
- To explore the various ways language is used effectively in media.
- To learn the appropriate form and structure essential for effective communication.

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


Total: 45 Periods
REFERENCES
3. Dept. of Humanities & Social Sciences, Anna University, English for Engineers and Technologists. Chennai: Orient Longman, 2006
**XC 9101  MATHEMATICS I**

**UNIT I  MATRICES**


**UNIT II  SEQUENCES & SERIES**


**UNIT III  FUNCTIONS OF SEVERAL VARIABLES**


**UNIT IV  ORDINARY DIFFERENTIAL EQUATIONS**


**UNIT V  LAPLACE TRANSFORM**

Transform of standard functions – Unit step and impulse functions – Periodic functions – Properties - Transforms of derivatives and integrals – Shifting theorems – Initial and Final Value Theorems – Inverse Transforms – Convolution Theorem – Application to linear differential equations with constant coefficients and simultaneous equation of first order with constant co-efficients.

L: 45 + T: 15 = Total 60 Periods

**TEXT BOOK**


**REFERENCES**

AIM: To provide an awareness to Computers and Computing

OBJECTIVES:
• To enable the student to learn the major Components of a Computer System
• To learn how arithmetic is handled in computers
• To know the correct and efficient ways of solving problems
• To learn to use office automation tools

UNIT I  COMPUTER GENERATIONS AND CLASSIFICATIONS  6
World of Computers – Computers in Life – Computer and its scope – Computers to fit every need – Computer Networks and the Internet – Computer and Society

UNIT II  DATA REPRESENTATION AND BINARY ARITHMETIC  6
Data and Program representation – System Unit- CPU – Performance and improvement

UNIT III  INPUT/OUTPUT UNITS AND MEMORY DEVICES  12

UNIT IV  OPERATING SYSTEMS AND LANGUAGES  9

UNIT V  APPLICATION SOFTWARE AND NETWORK  12

Total : 45 Periods

TEXT BOOK

REFERENCES
2. ITL Education Solution Ltd. “Introduction to Information Technology” , Pearson Education, New Delhi, 2009
UNIT I  ELECTRICAL PROPERTIES OF METALS  9

UNIT II  SEMICONDUCTOR PHYSICS  9

UNIT III  SEMICONDUCTOR AND OPTOELECTRONIC DEVICES  9
PN Junction: Forward bias: diffusion current, recombination and total current, Reverse bias, Bipolar Transistor, Junction Field Effect Transistor, MOSFET – Laser Characteristics- Semiconductor laser - Homojunction, Hetrojunction - Photo detectors- Photodiodes-phototransistors. Optical fiber and characteristics - Acceptance angle, Numerical aperture, fiber optic communication, -

UNIT IV  DISPLAY DEVICES  9

UNIT V  MAGNETIC DATA STORAGE AND OPTICAL MATERIALS  9

L: 45 + T:15 =Total 60 Periods

TEXT BOOKS

REFERENCES
UNIT I  POLYMER IN ELECTRONICS


UNIT II  COMPOSITES

Introduction, Advantages, characteristics, classifications – particulate. Fibrous and laminated composites, hybrid composites – Application of composites in electrical and electronic components

UNIT III  SPECIALITY MATERIALS


UNIT IV  FABRICATION OF INTEGRATED CIRCUITS

Introduction – Fabrication – MOS – NMOS, PMOS, CMOS, Ga-As Technologies, Printed circuit boards – Fabrications (Single layer only) – lamination, printing (photo and screen printing) and mechanical operation

UNIT V  BATTERIES

Primary and Secondary – Requirements – commercial batteries – Dry Cell, acid cells, alkaline batteries (Ni-Cd), Li-ion. Fuel cells – (hydrogen-oxygen) – UPS

Total: 45 Periods

TEXT BOOKS

REFERENCES
LEARNING OBJECTIVES

- to develop the students' language ability to a level that enables them to use English in their professional and academic environment
- To improve the communication skills of students seeking a career in IT industry

1. Listening Comprehension focusing on varying elements of vocabulary and structure
2. Video Comprehension developing combined audio-video receptive skills to deduce meaning from context - Use of online resources – Making short speeches
3. Seminar skills - agreeing and disagreeing, clarifying, questioning, persuading, emphasizing, concluding, interrupting; evaluating ideas and actions, presenting solutions, recommending action, comparing and contrasting, probability and possibility, cause and effect, criticizing - Group Discussion Activities on current issues – Presenting your viewpoints
4. Listening Comprehension of authentic materials – Self-instruction using listening and video materials from the self access language laboratory with comprehension exercises.
5. Use of the Internet to extract authentic materials on specific areas of interest

Total: 60 Periods

REFERENCES

2. Newspapers and Technical Magazines can be used for reference

XC 9103  FUNDAMENTALS OF COMPUTING LABORATORY  L T P C  0 0 4 2

a) WORD PROCESSING
   1. Document creation, Text manipulation with Scientific notations.
   2. Table creation, Table formatting and Conversion.
   4. Drawing - flow Chart
   5. LaTex Basics

b) SPREAD SHEET
   6. Chart - Line, XY, Bar and Pie.
   7. Formula - formula editor.
   8. Spread sheet - inclusion of object, Picture and graphics, protecting the document and sheet.
   9. Sorting and Import / Export features.

(c) DATABASE
   10. Creating and Manipulating MS-ACCESS File

Total: 60 Periods
LEARNING OBJECTIVES

- To develop the essential language skills needed to present technical material in oral and written form.
- To introduce different forms of technical writing and help students learn the required skills to write such technical material.

UNIT I
Reading Comprehension of Authentic Materials - Reading for real life context - Listening to different accents & understanding - Communicative & decision making activities based on authentic reading materials - Language Functions: agreeing, disagreeing, expressing likes & dislikes etc - Written communication tasks for authentic task oriented goals - Types of writing - process writing, Evaluative & Analytical Writing - Homophones - British / American Vocabulary - Framing Questions: Auxiliary Verbs, Question Tags

UNIT II
Understanding reading materials like schedules, brochures etc - Listening to authentic broadcasts from Radio & TV - Group discussion activities - Descriptive language development of equipment use & functions - Giving directions / instructions - Language of Instruction, Writing Recommendations - Futuristic writing - Official letters - inviting, accepting, Refusing - Foreign Words in English - Technical Jargons - Abbreviations, Acronyms

UNIT III
Reading Technical Documents & interpreting them - Listening to follow instructions - Note taking Exercises - Analysing problems & offering solutions - Presenting statistical information - Presenting numbers & figures - Role play - Mock Interviews - Job Application with CV - Writing a project proposal - Writing a post for a discussion forum - Compound Words - Time, Quality, Cost & Numbering Vocabulary - Numerical Expressions.

UNIT IV
Reading Reports & Analysing them - Reading for Specific Purposes - Listening to tonal inflections - Listening & Responding - Listening for collecting information - Information gathering activities concerning time, place, cost and personal description - Discussion on blog post or about discussion forum - Report Writing - Letter to Editor - Taking part in an online conversation - Blog entry - Reported Speech - Editing & Error Correction

UNIT V
Reading & understanding press releases pertaining to technical information - Listening for technical information - Public Speaking - Non-verbal Communication - Body Language, Eye Contact - Effective use of space, silence - Writing Technical Documents - User Manual, Instruction Manual etc - Posting a comment in an Online Conversation - Collocations in IT context - Active & Passive - Phrasal Verbs

Total : 45 Periods
REFERENCES

UNIT I    IMPROPER INTEGRALS
Improper integrals of the first and second kind and their convergence –
Evaluation of integrals involving a parameter by Leibnitz rule – Beta and Gamma
functions – Properties – Evaluation of integrals using Beta and Gamma functions – Error
functions.

UNIT II    MULTIPLE INTEGRALS
Double integral – Change of order of integration – Double integrals in polar coordinates
– Area enclosed by plane curves – Triple integrals – Volume as triple integral.

UNIT III   VECTOR CALCULUS
Gradient, divergence and curl of functions – Line, surface and volume integrals –
Green, Gauss and Stokes theorems – Verification and Applications.

UNIT IV    FOURIER SERIES
Dirichlet’s conditions - General Fourier series – Half range sine and cosine series –
RMS value – Parseval’s identity.

UNIT V     FOURIER TRANSFORMS
Statement of Fourier Integral Theorem – Fourier Transform and its Inverse – Sine and
Cosine transforms and their inverses – Properties – Convolution Theorem - Parseval’s
identity.

L: 45 +T:15 =Total 60 Periods

TEXT BOOK
   Delhi (2007).

REFERENCES
   Delhi (2007).
UNIT I  FUNDAMENTALS AND INPUT/OUTPUT STATEMENTS  9

UNIT II  CONTROL STATEMENTS, FUNCTIONS AND STORAGE CLASSES  9
While, do-while, for, if-else, switch and go to statements - break and continue statements. Defining a function - accessing a function- passing arguments to a function - Recursion Automatic, External and Static variables.

UNIT III  ARRAYS AND POINTERS  9
Defining and processing an array - passing arrays to a function - multi dimensional arrays Pointer declarations- passing pointers to a function - pointers and arrays - operations on printers - arrays of pointers – passing functions to other functions.

UNIT IV  STRUCTURES AND UNIONS  9
Defining a structure - Processing a structure - user-defined data type - Structure and pointers – passing structures to a function - self-referential structures - Unions.

UNIT V  FILE HANDLING  9
File Creation – Opening & Closing files – Read, Write, Appending data – ftell() and fseek() – File I/O – Command line arguments

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I PROGRAMMING CONCEPTS, IDENTIFICATION AND ENVIRONMENT DIVISIONS AND DATA DIVISION


UNIT II PROCEDURE DIVISION

Coding Complete COBOL Programs: The PROCEDURE DIVISION, The format of the Procedure division, Statements typically coded in the Main Module of Batch Programs, Statements typically coded for Processing Input records and Producing output records. Moving Data, Printing Information, and Displaying Output Interactively, The instruction formats of the MOVE STATEMENT, Numeric MOVE, Nonnumeric or Alphanumeric MOVE, Other Options of the MOVE STATEMENT. PRINTING OUTPUT, Interactive output that is displayed on a screen. Computing in COBOL: The Arithmetic Verbs and Intrinsic Functions, the Basic Arithmetic Verbs, Options Available with Arithmetic Verbs, The COMPUTE Statement, Use of Signed Numbers in Arithmetic Operations, Improving Program Efficiency with the USAGE Clause.

UNIT III CONDITIONS AND CONDITIONAL STATEMENTS

Decision Making Using the IF and EVALUATE Statements, Selection using a simple IF statement, Selection using other Options of the IF statement, CONDITION-NAMES. Iteration: The simple PERFORM, Iteration using other types of PERFORM Statements, Using Nested PERFORM varying statements. Control Break Processing: An introduction to control break processing, Program Requirements for control break processing, Multiple-level control breaks. Data Validation: Avoiding logic errors by validating input, What to do if input errors occur, When data should be validated, Understanding program interrupts.

UNIT IV TABLE HANDLING

Single level OCCURS clause, Processing data stored in an array, Using an OCCURS clause for Table Handling, Use of the Search statement for Table and Array processing, Varying option of SEARCH verb SEARCH ALL statement, Multiple level OCCURS Clause. Systems overview of Sequential processing: Sequential file updating, Validity checking in update procedures, Update procedures with multiple transaction records, Rewriting records on a disk.

UNIT V SORTING, MERGING AND FILEHANDLING

Sorting and Merging: The SORT features - an overview, Processing data before/after sorting, MERGE statement, Indexed and Relative File Processing: Systems considerations for organizing disk files, Features of magnetic disks and disk drives, Processing indexed disk files, Processing relative Disk Files, Converting a key field to a relative key.

L: 45 + T: 15 = Total 60 Periods
TEXT BOOKS

REFERENCES
5. Some presentations, home work exercises in: http://www-03.ibm.com/systems/z/advantages/charter/skills_coursematerials.html#COBOL
UNIT I  NUMBER SYSTEMS AND BINARY CODES


UNIT II  BOOLEAN ALGEBRA AND LOGIC GATE


UNIT III  GATE-LEVEL MINIMIZATION


UNIT IV  COMBINATIONAL LOGIC


UNIT V  SEQUENTIAL LOGIC


Total : 45 Periods

TEXT BOOK

REFERENCES
XC 9154  C PROGRAMMING LABORATORY  L T P C  0 0 4 2

1. Input/Output statements
2. Control functions
3. Functions with recursion
4. Arrays
5. Pointers
6. Structures and Unions
7. File Handling

Total : 60 Periods

XC 9155  DIGITAL SYSTEMS LABORATORY  L T P C  0 0 4 2

1. Study of logic gates
2. Simplification of Boolean expressions using K-maps
3. Adders - Subtractors
4. Code Converters
5. Multiplexers - Demultiplexers
6. Comparators
7. Parity Checkers
8. Pattern Detector
9. Construction of Flip Flops using logic gates
10. Study of Flip-flops using IC's
11. Shift Registers
12. Counters
13. Circuits Simulation for the above experiments

Total : 60 Periods
1. Develop a COBOL program to understand the arithmetic verbs viz., ADD, SUBTRACT, DIVIDE, MULTIPLY and COMPUTE.

2. Develop a COBOL program for the creation of a sequential data file. Assume suitable record structure.

3. Develop a COBOL program to access a desired record from a sequential file and to print it. Assume appropriate record structure.

4. Develop a COBOL program to create and manipulate an INDEXED file. The manipulation includes accessing a particular record, modify a desired record, add a record and delete a record. Assume a suitable record structure.

5. Develop a COBOL program to create and manipulate a RANDOM file. The manipulation includes accessing a particular record, to modify a desired record, to add a record to an existing file and to delete a record.

6. Develop a COBOL program to illustrate the concepts of REDEFINES and RENAMES clauses in COBOL.

7. Develop a COBOL program illustrating the usage of level-88 entry.

8. Develop a COBOL program for the implementation of ‘mid-square’ technique.

9. Develop a COBOL program illustrating the OCCURS clause.

10. Develop a COBOL program illustrating the SORT verb. Assume appropriate record structure.

11. Develop a COBOL program illustrating the MERGE verb. Assume appropriate record structure.

12. Develop a COBOL program to implement ‘Bubble sort’ technique on a file. Assume appropriate record structure.

Apart from the above problems, the course instructor may give some other exercise to the students from the topics of Business Data Processing.

Total : 60 Periods
UNIT I  ANALYTIC FUNCTIONS  

Function of a complex variable – Analytic function – Cauchy-Riemnn Equations – Properties of analytic functions – Conformal mapping of \( w = z + a \), \( w = 1/z \), \( w = cz \), \( w = z^2 \), \( w = e^z \) and Bilinear transformations.

UNIT II  COMPLEX INTEGRATION


UNIT III  Z-TRANSFORM

Transforms of elementary sequences – Unit Step and impulse functions – Properties – Shifting theorems – Initial and Final Value Theorems – Convolution Theorem – Inverse transform by power series and partial fractions – Application to linear difference equations with constant coefficients.

UNIT IV  FIRST ORDER PARTIAL DIFFERENTIAL EQUATIONS


UNIT V  HIGHER ORDER PARTIAL DIFFERENTIAL EQUATIONS

Homogeneous linear equations with constant coefficients – Complementary function – Particular integral – Non-homogeneous linear equations.

L: 45 + T: 15 = Total 60 Periods

TEXT BOOK


REFERENCES

UNIT I  FUNDAMENTALS OF LOGIC


UNIT II  COMBINATORICS


UNIT III  GROUPS

Groups – Definitions and Examples – Subgroups and Homomorphisms – Cosets and Lagrange’s theorem – Normal Subgroups – Group codes.

UNIT IV  LATTICES


UNIT V  GRAPH THEORY


Total 45 Periods

TEXT BOOKS
   [Sections: Chapter 2 ; 1.1 to 1.3, 5.5, 8.1, 8.2, 10.1 to 10.3; Chapter 11; 12.1, 12.2]
   [Sections: 3-5.1 to 3-5.4, 3-7.2 to 3-7.3; 4-1, 4-2]

REFERENCES
UNIT I      STACKS AND RECURSION
Arrays, Structures and Stacks – Recursion.

UNIT II      QUEUES AND LISTS
Queue and its sequential representation, Linked lists, Lists, Circular Linked lists.

UNIT III     TREES
Binary Trees – Binary tree representation – Application of trees.

UNIT IV      SORTING
Exchange sorts – Selection and Tree sorting – Insertion sorts – Merge sort.

UNIT V      SEARCHING
Basic Search Technique (except Interpolation search) – Tree Searching (except Balance Trees) – Hashing - Open Addressing – Deleting Items.

Total : 45 Periods

TEXT BOOK
   (Chapter 1 : Sections 1.2, 1.3, Chapter 2, Chapter 3 : Sections 3.1 to 3.3, Chapter 4 : Sections 4.1 to 4.3 and 4.5, Chapter 5 : Sections 5.1, 5.2 and 5.5, Chapter 6 : Sections 6.2 to 6.5, Chapter 7 : Sections 7.1, 7.2 and 7.4 (topics mentioned in the syllabus alone)

REFERENCE
**XC 9204**  
**OBJECT ORIENTED PROGRAMMING AND C++**  
**L T P C**  
**3 0 0 3**

**UNIT I**  
**OOP AND C++ FUNDAMENTALS**  
9

Object-oriented paradigm - Elements of object oriented programming – Merits and 
demerits of OO methodology - Characteristics of OOP - C++ data types - Operators - 
Expressions- Pointers - References - Enumeration - Classes.

**UNIT II**  
**CLASSES**  
9

Classes and Objects - Members and Member function - This pointer Constructors and 
Destructors – Friend functions - Template classes - New and Delete operators.

**UNIT III**  
**FUNCTIONS IN C++**  
9

Function Prototype - Arguments passing - Return type - Default arguments - Inline 
functions – Operator overloading - Function overloading - Operator function - Template 
functions.

**UNIT IV**  
**INHERITANCE**  
9

Derived class - Single Inheritance - Multiple Inheritance - Hierarchical Inheritance - 
Hybrid Inheritance - Virtual Functions - Virtual Base class - Nesting of classes.

**UNIT V**  
**INPUT/OUTPUT**  
9

Input/Output operations - Overloading the insertion and extraction operators - I/O stream 
classes – File input/output - Exception handling command line arguments.

TOTAL : 45 Periods

**TEXT BOOKS**

**REFERENCES**
UNIT I INTRODUCTION


UNIT II ARITHMETIC AND LOGIC UNIT

Introduction – Binary addition and subtraction – Complement representation of numbers – Binary multiplication and division – Floating point representation – Floating point arithmetic operations – Bit-Sliced ALU

UNIT III CONTROL UNIT

Micro-operations – Micro-programmed control – Micro instruction sequencing – Macro instruction execution – Hardwired Control

UNIT IV MEMORY AND I/O UNIT

CPU – Memory interaction – Storage technology – Memory array – Associative memory – Virtual memory – Auxiliary memory – Cache memory – Internal memory – Secondary Storage – I/O devices – I/O processing

UNIT V ADVANCED ARCHITECTURE

RISC – Parallel processing – Pipeline processors – Multiprocessors – Interconnection Structures: Time-shared Common Bus, Multiport Memory, Crossbar Switch, Multistage Switching network, Hypercube Interconnections

Total : 45 Periods

TEXT BOOKS


REFERENCES

UNIT I DATABASE SYSTEM CONCEPTS

UNIT II RELATIONAL DATABASE SYSTEM DESIGN
Relational Databases – Relational Algebra – Views – Tuple and Domain Relational Calculus – Domain Constraints – Referential Integrity – SQL – QBE – Triggers

UNIT III NORMALIZATION
Functional Dependencies – Inference rules – Decomposition – Properties – Normal Forms (NF) – First NF, Second NF, Third NF, Boyce-Codd NF, Forth NF, and Fifth NF.

UNIT IV DATA STORAGE AND QUERYING

UNIT V TRANSACTION MANAGEMENT

Total : 45 Periods

TEXT BOOK

REFERENCES
Data Structures:
1. Arrays and structures in C
2. Infix, Postfix, Prefix expressions using Stack
3. Linked list, Circular Linked list
4. Queues as Circular list
5. Operation on binary trees
6. Insert sort, Quick Sort, Heap Sort
7. Sequential Search and Binary Search

OOP:
1. Create a complex number class with all possible operators
2. Static members, Friend functions.
3. Operator overloading, overloading of assignment operator
4. Type conversions such as integer to complex, double to complex, complex to double.
5. Constructor, Destructor, Copy constructor.

Total: 60 Periods
1. DDL, DML, DCL
2. Subquery, Set functions
3. Date, Time, String functions
4. Queries
5. Single row functions, Group functions
6. Joins – Left, Right, Full, Equi
7. Index, Views
8. Triggers
9. PL/SQL Functions, Procedures
10. Database design and implementation with any one of the following case studies
    a. Library Information System
    b. Railway Reservation System
    c. Provisional Stores Information System

Total: 60 Periods

REFERENCE
UNIT I  DISTRIBUTED DATABASES


UNIT II  PARALLEL DATABASES


UNIT III  OODBMS AND ORDBMS


UNIT IV  ACTIVE AND XML DATABASES


UNIT V  MOBILE DATABASES

Mobile Databases: Location and Handoff Management – Effect of Mobility on Data Management – Location Dependent Data Distribution – Mobile Transaction Models

TEXT BOOKS


REFERENCES

UNIT I  SIGNAL AND SYSTEMS ANALYSIS  

UNIT II  ANALOG MODULATION TECHNIQUES  

UNIT III  ANALOG TO DIGITAL CONVERSION AND CODING TECHNIQUES  
Sampling – Quantization – Signal to Quantization Noise Ratio – Companding Information – Entropy – Entropy Coding Techniques - Shannon Fano Coding – Huffman Coding

UNIT IV  PULSE MODULATION AND MULTIPLEXING  

UNIT V  DIGITAL MODULATION AND TRANSMISSION  
Shift Keying Techniques – Binary ASK, Binary FSK, Binary PSK, QPSK – Modulation and Demodulation Principles – Comparison in terms of Bandwidth and Bit Error Rate

TEXT BOOK  

REFERENCES  

Total : 45 Periods
UNIT I  MARKUP AND SCRIPTING LANGUAGES  9

HTML – Javascript and VB Script – Control Structures – Functions – Arrays – Objects –
DHTML – Cascading style sheets – Object model and collections – Event model – Filters and Transitions – Data binding with tabular control – ActiveX control – Multimedia

UNIT II  JAVA FUNDAMENTALS  9

Objects and Classes – Packages – Inheritance – Interfaces and Inner classes – Exceptions – Generic programming – Collections

UNIT III  JAVA I/O, NETWORKING, THREADING  9


UNIT IV  APPLETS AND GUI  9


UNIT V  SERVER SIDE PROGRAMMING  9

Servlets – Java Server Pages – Database Connectivity - JDBC.  
Total : 45 Periods

TEXT BOOKS

REFERENCES
1. Deitel and Deitel, “Java – How to program”, Prentice Hall of India, 2009
UNIT I INTRODUCTION AND PROCESSES


UNIT II PROCESS MANAGEMENT

Threads – Multithreading Models – Threading Issues – Critical-Section Problem – Synchronization Hardware - Semaphores – Classic Problems of Synchronization — Monitors - CPU scheduler – Scheduling criteria – Scheduling algorithms – Multiple-Processor Scheduling

UNIT III DEADLOCKS, MEMORY MANAGEMENT AND VIRTUAL MEMORY


UNIT IV FILE SYSTEM


UNIT V CASE – STUDY : LINUX OPERATING SYSTEM


Total : 45 Periods

TEXT BOOK


REFERENCES

UNIT I ANALYZING ALGORITHMS

Algorithms – Analyzing algorithms – Designing algorithms – Growth of functions – Recurrences

UNIT II SORTING


UNIT III GRAPH ALGORITHMS


UNIT IV STRING MATCHING


UNIT V NP COMPLETENESS


L: 45 + T:15 = Total 60 Periods

TEXT BOOK
   Chapters 2.3,6,7,23: Sections: 1.1, 4.1 to 4.3, 8.1, 22.1 to 23.3, 24.1, 24.3, 32.1,32.3, 32.4, 30.1, 30.2, 34.1, to 34.3, 34.5.1, 34.5.4.

REFERENCES
1. Introduction to, used DB system (Oracle), simple post-relational database creation
2. Manipulation techniques for post-relational data - simple queries (e.g. Object-oriented database systems).
3. More complicated queries
4. Different kinds of queries
5. Connection to DB via JDBC
6. Demonstration of Java client

Total: 45 Periods

XC 9255 OPERATING SYSTEMS LABORATORY

1. Basic LINUX commands
2. Shell programming
3. Filters – grep, sed, awk
4. Introduction to C programming with Linux (cc, Makefile, gdb)
5. File Systems - create, open, read, write, close, lseek, stat
6. Process management - Fork, Exec commands, Wait

Total: 60 Periods
1. Console Java Applications
2. Convert hostname to IP address and vice versa
3. Identify the component parts (protocol, path, query string etc) of a URL and construct a URL from its component parts
4. Retrieve data from a URL
5. Socket Programming
6. Multi-threaded Applications
7. Applet programs
8. GUI programming using applets and frames
9. Client side scripting
10. Server side scripting
11. Designing and developing a website

Total : 60 Periods
UNIT I ONE-DIMENSIONAL RANDOM VARIABLES
Discrete and continuous random variables – Moments – Moment generating functions – Binomial, Poisson, Geometric, Uniform, Weibull, Normal, Exponential and Gamma distributions – Functions of random variables.

UNIT II TWO-DIMENSIONAL RANDOM VARIABLES
Joint distributions – Marginal and conditional distributions – Conditional expectations – Correlation – Regression curves.

UNIT III RELIABILITY MODELS
Failure distributions – Reliability and hazard functions – Exponential and Weibull failure models - Reliability of series and parallel systems – k-out of m systems – Redundancy – Weakest link technique.

UNIT IV TESTING OF HYPOTHESIS
Sampling distributions – Type I and Type II errors - Tests of hypothesis for Mean, Difference of means, Variance, Ratio of variances, independence of attributes and goodness of fit using normal, t, chi-square and F – distributions.

UNIT V DESIGN OF EXPERIMENTS
Analysis of variance – Completely randomized design – Randomized block design – Latin square design.

TEXT BOOKS

REFERENCES
UNIT I  COMMUNICATION FUNDAMENTALS  9

UNIT II  DATA LINK LAYER  9

UNIT III  NETWORK LAYER  9

UNIT IV  TRANSPORT LAYER  9

UNIT V  APPLICATION LAYER  9

Total: 45 Periods

TEXT BOOKS

REFERENCES
UNIT I  BASIC FEATURES OF C#  9

UNIT II  ADVANCED FEATURES OF C#  9

UNIT III  DATABASE PROGRAMMING  9
Windows Applications – Advanced Controls – Accessing data with ADO.Net – SQL – Executing SQL Statements (Insert, Delete, Update)

UNIT IV  ASP.NET, WEB FORMS AND WEB CONTROLS  9

UNIT V  ASP.NET AND WEB SERVICES  9

Total : 45 Periods

TEXT BOOKS

REFERENCES
UNIT I INTRODUCTION

UNIT II SOFTWARE PROJECT MANAGEMENT AND REQUIREMENT ENGINEERING
Management activities –project planning-project scheduling-Risk analysis and management- Functional and non-functional requirements-user requirements-system requirements-feasibility study-requirements elicitation and analysis - requirements validation -requirement management

UNIT III REQUIREMENT ENGINEERING AND DESIGN
System Organization-Modular Decomposition-Cohesion Coupling - multi processor architecture –Client server Architecture-distributed object architecture-Object Oriented design Process

UNIT IV SOFTWARE TESTING AND COST ESTIMATION
System testing – Integration Testing –Release testing-performance testing-Component Testing-Interface testing-Test Case Design-Partition testing-Structural testing-path testing –Software productivity-Estimation techniques-Algorithmic Cost modeling-Project duration and staffing

UNIT V SOFTWARE QUALITY AND CONFIGURATION MANAGEMENT

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I  VB.NET FUNDAMENTALS  9
Introduction to .NET Framework - Controls – Menus and Dialog Boxes – Variables and Operators – Decision Structures –Loops and Timers - Debugging -Trapping and Handling Errors

UNIT II  VB.NET PROGRAMMING  9

UNIT III  VB.NET UI DESIGN AND DATABASE APPLICATIONS  9

UNIT IV  VC++ FUNDAMENTALS  9

UNIT V  VC++ UI DESIGN AND DATABASE APPLICATIONS  9

Total : 45 Periods

TEXT BOOKS
1. Michael Halvorson, “Visual Basic.NET”, Prentice Hall of India, New Delhi, 2002. (Units 1, 2, 3 – Chapters 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20)
2. David J. Kruglinski, “Programming VC++”, Microsoft Press, 1998. (Units 4, 5 – Chapters 1, 2, 3, 4, 5, 6, 7, 8, 17, 18, 20, 31)

REFERENCES
3. MSDN Library
UNIT I INTRODUCTION TO NUMBER THEORY


UNIT II CONVENTIONAL ENCRYPTION


UNIT III PUBLIC KEY CRYPTOGRAPHY AND DIGITAL SIGNATURES


UNIT IV MESSAGE AUTHENTICATION


UNIT V NETWORK SECURITY


Total : 45 Periods

TEXT BOOK


REFERENCES

XT 9304  .NET PROGRAMMING LABORATORY

1. Console applications using C#
2. Windows applications using C# with DB connectivity
3. Web applications using ASP.net
4. Programs that utilize ADO.net to add / modify / delete / view database records
5. Usage of cookies and sessions in web applications
6. Publishing and Consuming Web Service
7. Remoting Applications

Total : 60 Periods

XC 9305  GUI APPLICATIONS LABORATORY

1. Dialog based applications with common controls and ActiveX Controls
2. Applications with menus and toolbars
3. Database Applications to Add, Delete, Modify and View Records
4. Applications with document/view architecture (SDI, MDI )
5. Applications with serialization
6. Database connectivity.

Total : 60 Periods
UNIT I  LINEAR PROGRAMMING

Formulation of linear programming models - Graphical solution - The simplex method - The dual simplex method.

UNIT II  APPLICATIONS OF LINEAR PROGRAMMING AND GOAL PROGRAMMING

Transportation problem - Assignment problem – Goal programming Formulation – Goal programming algorithms- The preemptive method.

UNIT III  NON-LINEAR PROGRAMMING

Lagrange multipliers – Equality constraints – Inequality constraints – Kuhn-Tucker conditions – Quadratic programming.

UNIT IV  QUEUEING MODELS


UNIT V  DETERMINISTIC DYNAMIC PROGRAMMING


Total: 45 Periods

TEXT BOOKS


REFERENCES

UNIT I  OVERVIEW OF OBJECT ORIENTED SYSTEM DEVELOPMENT  9

Overview of OOSD - Unified approach - Object basis - Classes - Software development process - OO methodologies

UNIT II  METHODOLOGY, MODELING AND UML OBJECT MODELING TECHNIQUE  9

Rumbaugh object modeling technique - Booch methodology – Jacobson methodologies - patterns - framework - UML

UNIT III  OBJECT ORIENTED ANALYSIS USE CASE DRIVEN  9

Use case - Business process modeling - classification - Association - Aggregation identifying object relationships, attributes and methods

UNIT IV  OBJECT ORIENTED DESIGN AND DEVELOPMENT PROCESS  9


UNIT V  CASE STUDIES IN OBJECT ORIENTED DESIGN AND DEVELOPMENT  9

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I  DISTRIBUTED DATABASES  

UNIT II  ELEMENTARY TCP SOCKETS  

UNIT III  APPLICATION DEVELOPMENT  

UNIT IV  SOCKET OPTIONS, ELEMENTARY UDP SOCKETS  

UNIT V  ADVANCED SOCKETS  

REFERENCES

Total : 45 Periods
### UNIT I XML BASICS


### UNIT II DATABASE PROGRAMMING


### UNIT III SERVERSIDE PROGRAMMING


### UNIT IV EJB AND WEB SERVICES


### UNIT V WEB FRAMEWORKS AND SCRIPTING

Struts – Java Server Faces – Ruby on Rails – Ajax

**Total : 45 Periods**

### TEXT BOOKS


### REFERENCES

AIM

To create awareness in every engineering graduate about the importance of environment, the effect of technology on the environment and ecological balance and make them sensitive to the environment problems in every professional endeavour that they participate.

OBJECTIVE

At the end of this course the student is expected to understand what constitutes the environment, what are precious resources in the environment, how to conserve these resources, what is the role of a human being in maintaining a clean environment and useful environment for the future generations and how to maintain ecological balance and preserve bio-diversity. The role of government and non-government organization in environment managements.

UNIT I ENVIRONMENT, ECOSYSTEMS AND BIODIVERSITY 14

Definition, scope and importance of environment – need for public awareness - concept of an ecosystem – structure and function of an ecosystem – producers, consumers and decomposers – energy flow in the ecosystem – ecological succession – food chains, food webs and ecological pyramids – Introduction, types, characteristic features, structure and function of the (a) forest ecosystem (b) grassland ecosystem (c) desert ecosystem (d) aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) – Introduction to biodiversity definition: genetic, species and ecosystem diversity – biogeographical classification of India – value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values – Biodiversity at global, national and local levels – India as a mega-diversity nation – hot-spots of biodiversity – threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India – conservation of biodiversity: In-situ and ex-situ conservation of biodiversity.

Field study of common plants, insects, birds
Field study of simple ecosystems – pond, river, hill slopes, etc.

UNIT II ENVIRONMENTAL POLLUTION 8

Definition – causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards – soil waste management: causes, effects and control measures of municipal solid wastes – role of an individual in prevention of pollution – pollution case studies – disaster management: floods, earthquake, cyclone and landslides.

Field study of local polluted site – Urban / Rural / Industrial / Agricultural.

UNIT III NATURAL RESOURCES 10

Forest resources: Use and over-exploitation, deforestation, case studies- timber extraction, mining, dams and their effects on forests and tribal people – Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems – Mineral resources: Use and
exploitation, environmental effects of extracting and using mineral resources, case studies – Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies – Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources. case studies – Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification – role of an individual in conservation of natural resources – Equitable use of resources for sustainable lifestyles.

Field study of local area to document environmental assets – river / forest / grassland / hill / mountain.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT


UNIT V HUMAN POPULATION AND THE ENVIRONMENT


Total = 45 Periods

TEXT BOOKS

REFERENCES
XC 9354  NETWORK PROGRAMMING LABORATORY  L T P C  0 0 4 2

1. Socket Programming
   a. TCP Sockets
   b. UDP Sockets
   c. Applications using sockets.
2. Simulation of ARP/RARP.
4. Simulation of routing protocols.
5. RPC.
6. DNS/HTTP.

Total : 60 Periods

XC 9355  WEB TECHNOLOGY LABORATORY  L T P C  0 0 4 2

1. Creating DTD/XML schema
2. Working with XSL
3. Using DOM and SAX Parser
4. Data Base Programming (JDBC/ ODBC/OLE DB)
5. Server Side Programming (ASP/JSP/PHP)
6. Session and Entity Bean
7. AJAX enabled Rails Applications

Total : 60 Periods

XC 9356  CASE TOOLS LABORATORY  L T P C  0 0 4 2


Suggested List of Applications

1. Student Marks Analyzing System
2. Online Ticket Reservation System
3. Payroll System
4. Course Registration System
5. ATM Systems

Total : 60 Periods
UNIT I  SOLUTION OF EQUATIONS AND EIGENVALUE PROBLEMS


UNIT II  INTERPOLATION

Newton’s divided difference formula, Lagrange’s formula. Newton’s forward and backward difference formulae, Natural Cubic Spline

UNIT III  NUMERICAL DIFFERENTIATION AND INTEGRATION

Numerical differentiation with interpolating polynomials, Numerical integration by Trapezoidal and Simpson’s 1/3rd rule. Double integrals using Trapezoidal and Simpson’s rules.

UNIT IV  INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS


UNIT V  BOUNDARY VALUE PROBLEMS FOR ORDINARY AND PARTIAL DIFFERENTIAL EQUATIONS

Finite difference solution for the second order ordinary differential equations. Finite difference solution for one dimensional heat equation (explicit scheme), one dimensional wave equation and two dimensional Laplace and Poisson equations.

TEXT BOOK


REFERENCES

Aims & Objectives:
1. To provide a firm understanding of modern practices in software engineering.
2. To study the concepts, methods, and tools for the analysis, design, construction, and measurement of complex software-intensive systems. Emphasize underlying principles.
3. To cover state-of-the-art software engineering and promising research areas, including principles of software engineering, requirements analysis, design, implementation, testing, and project management.

UNIT I  INTRODUCTION TO SOFTWARE PROJECT MANAGEMENT  9
Project Definition – Contract Management – Activities Covered By Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II  PROJECT EVALUATION  9

UNIT III  ACTIVITY PLANNING  9

UNIT IV  MONITORING AND CONTROL  9

UNIT V  MANAGING PEOPLE AND ORGANIZING TEAMS  9

Total : 45 Periods

TEXT BOOK
REFERENCES
UNIT I  WIRELESS COMMUNICATION FUNDAMENTALS


UNIT II  WIRELESS SERVICES

Voice services-Data services-GSM -system Architecture- protocols- connection establishment-Handover-Routing-GPRS-EDGE- Voice over IP.

UNIT III  WIRELESS NETWORKS


UNIT IV  WIRELESS DEVELOPMENT ENVIRONMENTS


UNIT V  MOBILE LAYERS

Mobile IP-DHCP-Routing-TCP over wireless networks and types of TCP.

Total : 45 Periods

TEXT BOOKS


REFERENCES

UNIT I  OVERVIEW OF COMPUTER GRAPHICS  9


UNIT II OUTPUT PRIMITIVES AND 2D TRANSFORMATIONS  9


UNIT III  3D GRAPHICS  9


UNIT IV INTRODUCTION TO MULTIMEDIA  9


UNIT V MULTIMEDIA INFORMATION REPRESENTATION  9


Total : 45 Periods

TEXT BOOKS

REFERENCES

The above exercises are to be carried out in open GL environment.

Tweened Animation- Motion tween – Motion along open/closed guided path - Shape tween – Size tween – Color Tween

Total : 60 Periods
UNIT I ENTERPRISE RESOURCE PLANNING


UNIT II ERP IMPLEMENTATION


UNIT III ERP AND TECHNOLOGY

ERP and Technology –Introduction - Business intelligence – E-commerce and E-Business – Business process re-engineering (BPR) – online analytical processing (OLAP)-Supply Chain Management (SCM) – Customer Relational ship Management (CRM).

UNIT IV MODULES IN ERP


UNIT V CURRENT TRENDS IN ERP


Total : 45 Periods

TEXT BOOKS

UNIT I MANAGEMENT AND ITS EVOLUTION 10

Definition - importance - different approaches to management - classical, behavioral and modern perspectives - business environment and its relevance - business ethics and social responsibility – Business ethics and social responsibility in the Perspective of Software Industry.

UNIT II PLANNING 7

Definition - purpose of planning - types of planning - formulation of objectives - premising and forecasting - guides to planning – planning methodologies in software companies.

UNIT III ORGANISING 8

Definition - line and staff functions - delegation of authority - co-ordination of functions - organizational structure - Different types of organizational structure specifically in software industry - centralization and decentralization of decisions - staffing.

UNIT IV LEADING 10

Definition - management versus leadership - different approaches to leadership - motivation - theories of motivation – Motivational tools for software employees - communication - Types of communication - communication process - Effective communication barriers in software companies.

UNIT V CONTROLLING 10

Definition - characteristics - importance - budgetary and non-budgetary controlling techniques - management by objectives and management by exception - management decision-making – Exclusive western and eastern management practices in software companies.

Total : 45 Periods

TEXT BOOKS

REFERENCES :
UNIT I   BASICS OF SOFTWARE QUALITY ASSURANCE  8

UNIT II SOFTWARE QUALITY STANDARDS AND PLAN  8

UNIT III DESIGNING TEST CASE  11
Role of process in software quality, Testing as a process, Software Testing principles, The Tester’s role in software development organization, Testing Design strategies – using black box approach to test case design, Equivalence class partitioning, boundary value analysis – using White box approach to test design, test adequacy criteria, covering code logic, paths - role in white box based test design, evaluating test adequacy criteria - levels of testing and different types of testing.

UNIT IV MANAGEMENT ON TESTING  9
Introduction – Testing and debugging goals and policies, Test planning, Test plan components, Test plan attachments, locating test items, reporting test results. Skills needed by a test specialist, building a testing group.

UNIT V TRACKING AND CONTROLLING  9
Definition terms, measurement and milestones for controlling and monitoring, reports and control issues, criteria for test completion, Developing a review program, Components of review plans and reporting review results.

Total : 45 Periods

TEXT BOOKS

REFERENCES
UNIT I SOFTWARE ARCHITECTURE AND SOA 9
Types of IT Architecture-SOA (Service Oriented Architecture)-Evolution-key components- Enterprise-wide SOA-Enterprise Applications-Software platforms for Enterprise Applications-contents Service-Oriented Enterprise Applications.

UNIT II SOA DESIGN AND GOVERNANCE 9
Service Oriented Analysis and Design-Technologies for SOA-Business case for SOA-SOA Implementation and Governance-Trends in SOA.

UNIT III WEB SERVICES 9

UNIT IV WEB SERVICES IMPLEMENTATION 9
Java implementation-JAXP-JAX-RPC-JAXM-JAXR-JAXB- .NET framework- Web Service through .NET.

UNIT V ADVANCED TOPICS 9

Total: 45 Periods

TEXT BOOKS

REFERENCES
Testing of the following software using software engineering methodology:

Use Rational Suite and other Open source Tools.

1. Perform experiments to do the following:
   
a. Unit Testing
   b. System and Integration Testing
   c. Regression Testing
   d. User Acceptance Testing (UAT)
   e. Performance Testing – Front-end and Back-end

2. Mini projects on any relevant current topics. Suggested topics:
   
a. Insurance Management Application
b. Reservation Systems for Air lines, Railways etc.
c. Knowledge Management System in education
d. Remote Procedure Call Implementation
e. Banking Applications

Total : 60 Periods

XC 9506  SERVICE ORIENTED ARCHITECTURE LABORATORY

1. XML-RPC and SOAP implementation.
2. Web services using Java.
3. Web services using .NET.
5. Integration of heterogeneous Web services.
6. Case studies.

Total : 60 Periods
UNIT I  INTRODUCTORY CONCEPTS  9

UNIT II  SEARCH ENGINES AND DATA VISUALIZATION  9

UNIT III  STATISTICS AND DATA MINING  9

UNIT IV  PATTERN MATCHING  9

UNIT V  MODELING AND SIMULATION  9

Total : 45 Periods

TEXT BOOK

REFERENCE
UNIT I  SOURCE CODING


UNIT II  CHANNEL CAPACITY AND CODING

Channel Models—Channel Matrix—Channel Capacity—Channel Coding Theorem—Information Capacity Theorem and Shannon Limit.

UNIT III  ERROR CONTROL CODING

Error Correction using Linear block codes—Generator and Parity—Check Matrices—Cyclic Codes—BCH codes—Gorenstein Zierler Decoding algorithm—Golay codes—efficiency of LBC—Convolution coding—decoding algorithms—Viterbi decoding

UNIT IV  TEXT AND IMAGE COMPRESSION

Compression principles—Text compression—Dynamic Huffman Coding—Arithmetic Coding—Image Compression—Graphic interchange format—Tagged image file format—Discrete Cosine Transform—Discrete Fourier Transform

UNIT V  AUDIO AND VIDEO COMPRESSION

Audio Compression—Differential Pulse Code Modulation—Adaptive Coding—Video Compression—MPEG2 and MPEG4

L : 45 + T : 15 = Total 60 Periods

TEXT BOOKS


REFERENCES

UNIT I
GIS – Definition -History of GIS -Basic Components of GIS – Hardware, Software, Data, Methods, People – List of GIS Software: Popular software, Open Source software

UNIT II

UNIT III

UNIT IV

UNIT V

Total: 45 Periods

TEXT BOOK

REFERENCES
1. Peter A. Burrough, Rachael A. McDonnell, Principles of GIS, Oxford University Press, 2000
UNIT I  SIGNALS SYSTEMS  

UNIT II  FFT  

UNIT III  IIR FILTER DESIGN  

UNIT IV  FIR FILTER DESIGN  

UNIT V  FINITE WORD LENGTH EFFECTS  

Total : 45 Periods

TEXT BOOK  

REFERENCES  
UNIT I FOURIER ANALYSIS

Fourier and inverse Fourier transforms – Continuous time convolution and the delta function – Fourier transform of square integrable functions – Poisson’s summation formula.

UNIT II WAVELET TRANSFORMS AND TIME-FREQUENCY ANALYSIS


UNIT III MULTI RESOLUTION ANALYSIS AND WAVELETS

The Haar wavelet construction – Multi resolution analysis – Riesz basis to orthonormal basis – Sealing function and scaling identity – Construction of wavelet basis.

UNIT IV COMPACTLY SUPPORTED WAVELETS

Vanishing moments property – Meyer’s wavelets – Construction of a compactly supported wavelet – Smooth wavelets.

UNIT V APPLICATIONS

Digital Filters – Discrete wavelet transforms and Multi resolution analysis – Filters for perfect reconstruction – Para unitary filters and orthonormal wavelets – Filter design for orthonormal wavelets – Biorthogonal filters.

Total: 45 Periods

TEXT BOOKS

UNIT I  INTRODUCTION


UNIT II  MEMORY MANAGEMENT AND INTERRUPTS


UNIT III  REAL-TIME OPERATING SYSTEMS – RTOS


UNIT IV  EMBEDDED SYSTEM DESIGN AND IMPLEMENTATION

Requirements of an embedded system – architecture styles and patterns – design practices – implementation aspects and choices.

UNIT V  EMBEDDED SOFTWARE DEVELOPMENT TOOLS

Host and target machines – cross compilers – linker and locators for embedded software – address resolution – locating program components – initialized data and constant strings – PROM programmers – ROM emulators – Flash memory.

Total : 45 Periods

TEXT BOOKS


REFERENCES

UNIT I  FAULT TOLERANT DESIGN  9


UNIT II  SOFTWARE RELIABILITY MODELING  9

Concepts – General Model Characteristic – Historical Development of models – Model Classification scheme – Markovian models – General concepts – General Poisson-Type Models – Binomial – Type Models – Poisson-Type models – Fault reduction factor for Poisson-Type models.

UNIT III  COMPARISON OF SOFTWARE RELIABILITY MODELS  9


UNIT IV  INFORMATION SECURITY AND INTEGRITY  9


UNIT V  SECURITY ANALYSIS  9


Total : 45 Periods

REFERENCES

UNIT I MEASUREMENTS THEORY


UNIT II DATA COLLECTION AND ANALYSIS


UNIT III PRODUCTS METRICS


UNIT IV QUALITY METRICS


UNIT V MANAGEMENT METRICS


Total : 45 Periods

REFERENCES:

UNIT I  TIME AND SPACE BOUNDED COMPUTATIONS AND MODELS OF COMPUTATIONS  

Finite Automaton, Turing machines, Non-deterministic Turing Machines, Oracle Turing Machines – Order of magnitude, running time and work space of TMs – Time and Space constructability

UNIT II  CENTRAL COMPLEXITY CLASSES  

Basic definitions and relationships – Computing functions – Invertibility and honesty – Polynomial time many-one reducibility – Natural Np Complete Sets – Natural PSPACE complete sets.

UNIT III  TURING REDUCIBILITY AND NON-UNIFORM COMPLEXITY  


UNIT IV  UNIFORM DIAGONALIZATIONS  

Uniform Deagonalization – Presentability and other properties – Recursive sets and diagonalization – Applications to recursively presentable sets – Delayed diagonalization.

UNIT V  POLYNOMIAL TIME HIERARCHY  

Polynomial time hierarchy – Characterization – Relations with quantifies – Complete sets and presentability – Alternating TM

TEXT BOOK


REFERENCES

UNIT I  OVERVIEW AND PLANNING PROCESS  9

UNIT II  SOFTWARE SIZE, PROBE SIZE ESTIMATION AND SCHEDULE ESTIMATION  9

UNIT III  DESIGN AND CODE METHODOLOGIES AND REVIEWS  9

UNIT IV  SOFTWARE QUALITY MANAGEMENT AND PROCESS DESCRIPTION  9

UNIT V  DATA SUMMARY AND CAUSAL ANALYSIS AND DEVELOPING PSP PROCESS SCRIPTS  9

Total : 45 Periods

TEXT BOOK
UNIT I  HIGH SPEED NETWORKS


UNIT II  CONGESTION AND TRAFFIC MANAGEMENT


UNIT III  TCP AND ATM CONGESTION CONTROL


UNIT IV  INTEGRATED AND DIFFERENTIATED SERVICES


UNIT V  PROTOCOLS FOR QOS SUPPORT


Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I OVERVIEW OF PATTERN RECOGNITION


UNIT II UNSUPERVISED CLASSIFICATION

Clustering for unsupervised learning and classification ,clustering concepts C- means algorithm - hierarchical clustering - Graph theoretic approach to pattern clustering-Validity of clustering solutions.

UNIT III FEATURE EXTRACTION AND STRUCTURAL PATTERN RECOGNITION


UNIT IV AI TECHNIQUES


UNIT V RECENT ADVANCES AND IMAGE APPLICATIONS


Total : 45 Periods

REFERENCES

UNIT I

Performance Characteristics – Requirement Analysis: Concepts – User, Application, Device, Network Requirements – Single Queueing systems: M/M/1 Queueing System – Little’s Law – Reversibility and Burke’s theorem – M/M/1/N – M/M/∞ - M/M/m – M/M/m/m – M/M/1/∞ - M/G/1 Queueing System.

UNIT II


UNIT III


UNIT IV


UNIT V


Total: 45 Periods

TEXT BOOKS


REFERENCES

UNIT I INTRODUCTION


UNIT II RANDOM NUMBERS


UNIT III DESIGN OF SIMULATION EXPERIMENTS


UNIT IV SIMULATION LANGUAGES

Comparison and selection of simulation languages – study of anyone simulation language.

UNIT V CASE STUDY

Development of simulation models using simulation language studied for systems like queuing systems – Production systems – Inventory systems – maintenance and replacement systems and Investment analysis.

Total: 45 Periods

REFERENCES

UNIT I  FUNDAMENTALS OF IMAGE PROCESSING  9


UNIT II  IMAGE ENHANCEMENT  9


UNIT III  IMAGE SEGMENTATION AND FEATURE ANALYSIS  9


UNIT IV  MULTI RESOLUTION ANALYSIS AND COMPRESSIONS  9


UNIT V  APPLICATIONS OF IMAGE PROCESSING  9


Total : 45 Periods

REFERENCES

UNIT I  DATAWAREHOUSING

UNIT II  MULTI–DIMENSIONAL DATA MODEL
Online Analytical Processing (OLAP) – stars, snowflakes and fact constellations-schemas for multidimensional databases – roll-up – drill-down – slice and dice – pivot. Starnet Query Model. Types of OLAP servers: ROLAP vs MOLAP vs HOLAP.

UNIT III  DATA MINING

UNIT IV  CLASSIFICATION AND PREDICTION
Issues Regarding Classification and Prediction – Classification by Decision Tree Introduction – Bayesian Classification – Rule Based Classification – Support Vector Machines – Associative Classification – Other Classification Methods – Prediction – Accuracy and Error Measures – Evaluating the Accuracy of a Classifier or Predictor – Ensemble Methods – Model Section.

UNIT V  CLUSTER ANALYSIS
Types of Data in Cluster Analysis – A Categorization of Major Clustering Methods – Partitioning Methods – Hierarchical methods – Density-Based Methods – Grid-Based Methods – Model-Based Clustering Methods – Clustering High-Dimensional Data – Constraint-Based Cluster Analysis – Outlier Analysis.

Total: 45 Periods

TEXT BOOKS

REFERENCES