### M.Sc. (Computer Science)
#### Five-Year Integrated Programme

**Semester I**

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<tr>
<td>XT 9026</td>
<td>Digital Image Processing</td>
<td>3</td>
<td>0</td>
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</tr>
<tr>
<td>XT 9027</td>
<td>Data Warehousing and Mining</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
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
UNIT I  MATRICES  9
Eigenvalues and Eigenvectors – Properties of eigenvalues - Cayley Hamilton theorem - orthogonal reduction of a symmetric matrix to diagonal form – Reduction of quadratic form to canonical form by orthogonal transformation.

UNIT II  SEQUENCES & SERIES:  9

UNIT III  FUNCTIONS OF SEVERAL VARIABLES  9

UNIT IV  ORDINARY DIFFERENTIAL EQUATIONS  9

UNIT V  LAPLACE TRANSFORM  9
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  

UNIT II  SEMICONDUCTOR PHYSICS  

UNIT III  SEMICONDUCTOR AND OPTOELECTRONIC DEVICES  
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  

UNIT V  MAGNETIC DATA STORAGE AND OPTICAL MATERIALS  

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

L: 45 +T:15 =Total 60 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

Total : 45 Periods

REFERENCES
UNIT I  IMPROPER INTEGRALS  9


UNIT II  MULTIPLE INTEGRALS  9


UNIT III  VECTOR CALCULUS  9

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

UNIT IV  FOURIER SERIES  9

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

UNIT V  FOURIER TRANSFORMS  9


L: 45 + T:15 =Total 60 Periods

TEXT BOOK

REFERENCES
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 BASICS OF CIRCUIT ANALYSIS
Kirchoff's laws, DC and AC excitation, Series and parallel circuits, Sinusoidal steady state analysis, Mesh current and node voltage method of analysis, Matrix method of analysis

UNIT II NETWORK THEOREMS
Thevenin's and Norton's theorems, Superposition theorem, Compensation theorem, Reciprocity theorem, Maximum power transfer theorem, Millman's theorem, Tellegen theorem.

UNIT III RESONANCE AND COUPLED CIRCUITS
Series and parallel resonance, Quality factor and Bandwidth, Multi resonance circuits, Coupling coefficient, Frequency response and bandwidth, Tuned circuit.

UNIT IV TRANSIENTS
Transient response of RL, RC and RLC circuits to DC excitation, Natural and forced oscillations.

UNIT V DUALITY AND TOPOLOGY
Concept of duality, Dual network, Graphs of a network, Trees, Chords and branches, Tieset and cutset of a graph, Applications to network analysis.

Total : 45 Periods

TEXT BOOKS

REFERENCES
UNIT I  NUMBER SYSTEMS AND BINARY CODES  9

UNIT II  BOOLEAN ALGEBRA AND LOGIC GATES  9

UNIT III  GATE-LEVEL MINIMIZATION  9

UNIT IV  COMBINATIONAL LOGIC  9

UNIT V  SEQUENTIAL LOGIC  9

Total : 45 Periods

TEXT BOOK

REFERENCES
XC 9154 C PROGRAMMING LABORATORY

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

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
UNIT I  INTRODUCTION TO ENGINEERING DRAWING  8


UNIT II  COMPUTER GRAPHICS  4

Hardware requirements – Functions and features of drafting softwares – Different Input / Output Techniques – Graphic user interface.

UNIT III  GEOMETRY CREATION  24

Creation of 2-D drawing for simple components using combination of basic entities like point, line, arc, circle, polygon etc., - Selection methods – Editing commands – Creation of blocks – Arraying – layering – Dimensioning – Hatching – Text Creation and preparation of part list.

UNIT IV  ADVANCED EDITING AND 3-D MODELING  16

Creation of 3-D solid models – User coordinate System – 3D editing – Retrieval of required views from the 3D-models – Sectioning.

UNIT V  SPECIAL TOPICS  8

Drawing standards – Automatic creation of drawing using LISP / Graphics programming.

Total : 60 Periods

REFERENCE

UNIT I  ANALYTIC FUNCTIONS

Function of a complex variable – Analytic function – Cauchy-Riemnnn 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  MATHEMATICAL LOGIC I  9


UNIT II  MATHEMATICAL LOGIC II  9

Predicate Calculus – Inference theory for statement calculus and predicate calculus – Mathematical Induction.

UNIT III  RELATIONS AND FUNCTIONS  9


UNIT IV  GROUPS  9

Groups – Definitions and Examples – Subgroups and Homomorphism – Cosets and Lagrange’s theorem – Normal Subgroups – Group Codes.

UNIT V  LATTICES  9


Total : 45 Periods

TEXT BOOKS
   [Sections : 1-2.1 to 1-2.4, 1-2.6 to 1-2.14, 1-3; 1-4.1 to 1-4.3, 1-5, 1-6.4 and 1-6.5, 2-5.1; 3-5.1 to 3-5.4, 3-7.2 to 3-7.3; 4-1, 4-2]
   [Sections: 2.3, 7.1, 7.3, 7.4]

REFERENCES
UNIT I STACKS AND RECURSION 9
Arrays, Structures and Stacks – Recursion.

UNIT II QUEUES AND LISTS 9
Queue and its sequential representation, Linked lists, Lists, Circular Linked lists.

UNIT III TREES 9
Binary Trees – Binary tree representation – Application of trees.

UNIT IV SORTING 9
Exchange sorts – Selection and Tree sorting – Insertion sorts – Merge sort.

UNIT V SEARCHING 9
Basic Search Technique (except Interpolation search) – Tree Searching (except Balance Trees) – Hashing - Open Addressing – Deleting Items.

Total: 45 Periods

TEXT BOOK
1. Langsam Y., Augenstein M. and Tenenbaum A. M. – “Data Structures using C and C++.”, Prentice Hall of India, New Delhi – 2009,(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 Inheri-
tance - 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 handlingcommand 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 number 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 11

UNIT II RELATIONAL DATABASE SYSTEM DESIGN 9
Relational Databases – Relational Algebra – Views – Tuple and Domain Relational Calculus – Domain Constraints – Referential Integrity – SQL – QBE – Triggers

UNIT III NORMALIZATION 6
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 10

UNIT V TRANSACTION MANAGEMENT 9

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**

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**Database Management Systems Laboratory**

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. PL/SQL Functions (or equivalent), Procedures
9. Triggers
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 INTRODUCTION AND INTEL 8085


UNIT II 16 – BIT PROCESSORS (INTEL 8086)

Intel 8086: Architecture – addressing modes and Instruction format interfacing of memory & I/O device – odd and even addressed blanks – storing/retrieval of 16 bit data at an odd address – Simple Programs

UNIT III INTRODUCTION TO MICROCONTROLLERS


UNIT IV INTERFACING BASICS

On controlling/monitoring continuous varying (analog) non-electrical signal using microprocessor/microcontrollers need for interfacing ICs – thumb wheel switch as input devices – single LED, seven segment LED as output devices – interfacing these using both memory mapped I/O and peripheral mapped I/O – D/A, A/D ICs and their signals – sample and hold IC and its usage.

UNIT V INTERFACING ICs

(i) 8255 - Programmable Peripheral Interface along with 8085
(ii) 8254 – Programmable Interval Timer along with Intel 8086
(iii) Need for the following ICs: (a) 8251 – USART; (b) 8257 – Direct Memory Access Controller; (c) 8259 – Programmable Interrupt Controller; (d) 8279 – Keyboard / Display Interface.
(iv) 8085 and 8051 based industrial automations

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I  MARKUP AND SCRIPTING LANGUAGES  9


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 10


UNIT II PROCESS MANAGEMENT 12

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 9


UNIT IV FILE SYSTEM 9


UNIT V CASE – STUDY: LINUX OPERATING SYSTEM 5


Total: 45 Periods

TEXT BOOK

REFERENCES
UNIT I  FUNDAMENTAL PRINCIPLES OF COUNTING  9


UNIT II  GENERATING FUNCTIONS AND RECURRENCE RELATIONS  9


UNIT III  AN INTRODUCTION TO GRAPH THEORY  9

Definitions and Examples – Subgraphs, Complements and Graph Isomorphism – Euler Trails and Circuits – Planar graphs – Hamilton Paths and Cycles – Graph colouring and Chromatic polynomials.

UNIT IV  TREES  9


UNIT V  OPTIMIZATION AND MATCHING  9


TEXT BOOK

1. Grimaldi, R. P., “Discrete and combinatorial Mathematics”, 4th Edition, Pearson Education, (Singapore) Pte. Ltd., 2002. [Sections: 1.1 to 1.4, 5.5, 8.1 to 8.3; Chapter 9, 10.1, 10.2, 10.4; Chapter 11; Chapter 12; Chapter 13]

REFERENCES

UNIT I  ANALYZING ALGORITHMS
Algorithms – Analyzing algorithms – Designing algorithms – Growth of functions
Recurrences

UNIT II  SORTING
Insertion sort – Quick sort – Divide and Conquer – Merge sort – Heap sort – Lower
bounds for sorting.

UNIT III  GRAPH ALGORITHMS
Representations of graphs – Breadth-first search – Depth-first search – Minimum
spanning tree – The algorithms of Kruskal and Prim – Shortest paths – Dijkstra’s
algorithm – Bellman and Ford algorithm.

UNIT IV  STRING MATCHING
The naïve string-matching algorithm – String matching with finite automata – The Knuth-
Morris – Pratt algorithm.

UNIT V  NP COMPLETENESS
Polynomial time – The complexity class NP – NP completeness – Reducibility – NP-
complete problems.

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, 22.1to 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. Baase, S. Computer Algorithms: Introduction to Design and Analysis, Second
1. **IC EXPERIMENTS**
   2. Code converters.
   3. Shift registers; Counters.
   4. Encoders, Decoders, Multiplexers and Demultiplexers
   5. Memory devices.
   7. Application circuits of NE 555.

2. **MICROPROCESSOR EXPERIMENTS**
   1. Programming exercises involving looping loop with counting indexing.
   2. Multiplication and Division of signed and unsigned numbers.
   3. Interfacing LED, DIP and Thumb wheel switches.
   5. Design and implementation of temperature control loop.
   6. Study of serial interface and interfacing of VDU.

   **Total : 60 Periods**

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**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
XT 9301 COMPUTER NETWORKS

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
AIM
To have an understanding of foundations of design of assemblers, loaders, linkers, and macro processors.

OBJECTIVES
• To understand the relationship between system software and machine architecture.
• To know the design and implementation of assemblers
• To know the design and implementation of linkers and loaders.
• To have an understanding of macro processors.
• To have an understanding of system software tools.

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

UNIT II ASSEMBLERS

UNIT III LOADERS AND LINKERS

UNIT IV MACRO PROCESSORS

UNIT V SYSTEM SOFTWARE TOOLS
Text Editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User Interface criteria.

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I INTRODUCTION

Attributes of good software - System Dependability-Availability and reliability-Safety-Security - Waterfall life cycle model-Evolutionary development -process iteration-Incremental Delivery-Spiral model.

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


TEXT BOOK

REFERENCES

Total : 45 Periods
# VISUAL PROGRAMMING

## UNIT I  VB.NET FUNDAMENTALS 9


## 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
   (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)

   (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  9

Modular arithmetic – Fermat Theorem-Euler’s theorem – Euclid’s algorithm – Extended
Euclid’s Algorithm, Chinese remainder theorem, Modular Exponentiation –Galois Fields,
- Discrete logarithm- Primality Testing Using Miller-Rabin-Introduction to AKS algorithm.

UNIT II  CONVENTIONAL ENCRYPTION  9

Conventional encryption model – Crypt Analysis of Caesar Cipher- Mono alphabetic

UNIT III  PUBLIC KEY CRYPTOGRAPHY AND DIGITAL SIGNATURES  9

RSA algorithm – Diffie - Hellman key exchange-Digital Signature – Authentication
protocols- Digital Signature Standard.

UNIT IV  MESSAGE AUTHENTICATION  9

MAC functions, Hash functions – Authentication requirements – authentication functions
– Authentication Mechanisms Using Hash and MACs – Secure Hash Algorithms-
SHA512-WHIRLPOOL, HMAC, CMAC.

UNIT V  NETWORK SECURITY  9


Total : 45 Periods

TEXT BOOK


REFERENCES:

   1994.
6. Abhiji Das and Veni Madhavan C.E , ” Public Key Cryptography – Principles and
ALGORITHMS LABORATORY

1. Creating queues. Adding, deleting elements to queue.
2. Creating lists. Adding, deleting elements to list.
4. Implementing BFS algorithm.
5. Implementing DFS algorithm.

Total: 60 Periods

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


Total : 45 Periods

REFERENCES
XC 9353 WEB TECHNOLOGY L T P C
3 0 0 3

UNIT I  XML BASICS 9

UNIT II  DATABASE PROGRAMMING 9

UNIT III  SERVERSIDE PROGRAMMING 9

UNIT IV  EJB AND WEB SERVICES 9

UNIT V  WEB FRAMEWORKS AND SCRIPTING 9
Struts – Java Server Faces – Ruby on Rails – Ajax

Total : 45 Periods

TEXT BOOKS

REFERENCES

44
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
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
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
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
CASE TOOLS LABORATORY


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: 45 Periods

WEB TECHNOLOGY LABORATORY

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

NETWORKS PROGRAMMING LABORATORY

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
UNIT I  REGULAR SETS AND FINITE AND AUTOMATA  9
Finite State Automata – Deterministic and Non-deterministic model – Languages accepted by Finite State Automata – Pumping Lemma for regular set.

UNIT II  CONTEXT FREE LANGUAGES  9

UNIT III  PUSHDOWN AUTOMATA  9

UNIT IV  TURING MACHINES AND UNDECIDABILITY  9
Turing Machine model – Computational languages and functions – Modifications of Turing Machines (only descriptions, no proof for theorems on equivalence of the modifications). – Properties of recursive and recursively enumerable languages – Universal Turing Machines and the undecidable problems.

UNIT V  THE CHOMSKY HIERARCHY  9

L: 45 +T:15 =Total 60 Periods

TEXT BOOK

REFERENCES
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.

L: 45 +T:15 =Total 60 Periods

TEXT BOOK

REFERENCES
UNIT I  WIRELESS COMMUNICATION FUNDAMENTALS  9


UNIT II  WIRELESS SERVICES  9

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

UNIT III  WIRELESS NETWORKS  11


UNIT IV  WIRELESS DEVELOPMENT ENVIRONMENTS  9


UNIT V  MOBILE LAYERS  7

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

Total : 45 Periods

TEXT BOOKS

REFERENCES
UNIT I  OVERVIEW OF COMPUTER GRAPHICS


UNIT II  OUTPUT PRIMITIVES AND 2D TRANSFORMATIONS


UNIT III  3D GRAPHICS


UNIT IV  INTRODUCTION TO MULTIMEDIA


UNIT V  MULTIMEDIA INFORMATION REPRESENTATION


Total : 45 Periods

TEXT BOOKS


REFERENCES


The above exercises are to be carried out in open GL environment. (9 labs)

Tweened Animation- Motion tween – Motion along open/closed guided path - Shape tween– Size tween – Color Tween (9 labs)

Total : 60 Periods
UNIT I OVERVIEW

Introduction to the Front End of the Compiler – Tools to Generate Lexical Analyzer, Syntax Analyzer and Intermediate Code Generator.

UNIT II RUN TIME ENVIRONMENTS


UNIT III CODE GENERATION


UNIT IV MACHINE-INDEPENDENT OPTIMIZATIONS


UNIT V OPTIMIZING FOR PARALLELISM AND LOCALITY


TEXT BOOK

REFERENCES
UNIT I  MANAGEMENT AND ITS EVOLUTION  
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  
Definition - purpose of planning - types of planning - formulation of objectives - premising and forecasting - guides to planning – planning methodologies in software companies.

UNIT III  ORGANISING  
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  
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  
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
<table>
<thead>
<tr>
<th>UNIT</th>
<th>TOPIC</th>
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<td>I</td>
<td>BASICS OF SOFTWARE QUALITY ASSURANCE</td>
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<td>SOFTWARE QUALITY STANDARDS AND PLAN</td>
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<td>DESIGNING TEST CASE</td>
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<td>V</td>
<td>TRACKING AND CONTROLLING</td>
<td>9</td>
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</tbody>
</table>

**UNIT I**
BASICS OF SOFTWARE QUALITY ASSURANCE
- Ethical Basis for Software Quality
- Total Quality Management Principles
- SQA components in project life cycle
- SQA defect removal policies
- Reviews

**UNIT II**
SOFTWARE QUALITY STANDARDS AND PLAN
- Quality Standards, Practices and Conventions
- Software Configuration Management
- Reviews and Audits
- Software Cost Estimation (COCOMO)
- Quality Management Standards
- Reliability

**UNIT III**
DESIGNING TEST CASE
- 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
- 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
- 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

**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 Airlines, Railways etc.
   c. Knowledge Management System in education
   d. Remote Procedure Call Implementation
   e. Banking Applications

   **Total : 60 Periods**

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**XT 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

UNIT II  SEARCH ENGINES AND DATA VISUALIZATION

UNIT III  STATISTICS AND DATA MINING

UNIT IV  PATTERN MATCHING

UNIT V  MODELING AND SIMULATION

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
9

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
9


UNIT III 
MULTI RESOLUTION ANALYSIS AND WAVELETS
11

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
10

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

UNIT V 
APPLICATIONS
6

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  9

UNIT II  DATA COLLECTION AND ANALYSIS  9

UNIT III  PRODUCTS METRICS  9

UNIT IV  QUALITY METRICS  9

UNIT V  MANAGEMENT METRICS  9

REFERENCES

Total : 45 Periods
UNIT I  TIME AND SPACE BOUNDED COMPUTATIONS AND MODELS OF COMPUTATIONS  9

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  9

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  9


UNIT IV  UNIFORM DIAGONALIZATIONS  9

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

UNIT V  POLYNOMIAL TIME HIERARCHY  9

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

Total : 45 Periods

TEXT BOOK

REFERENCES
UNIT I  OVERVIEW AND PLANNING PROCESS  

UNIT II  SOFTWARE SIZE, PROBE SIZE ESTIMATION AND SCHEDULE ESTIMATION  

UNIT III  DESIGN AND CODE METHODOLOGIES AND REVIEWS  

UNIT IV  SOFTWARE QUALITY MANAGEMENT AND PROCESS DESCRIPTION  

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

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  9


UNIT II  UNSUPERVISED CLASSIFICATION  8

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  8


UNIT IV  AI TECHNIQUES  10


UNIT V  RECENT ADVANCES AND IMAGE APPLICATIONS  10


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


UNIT II   IMAGE ENHANCEMENT


UNIT III   IMAGE SEGMENTATION AND FEATURE ANALYSIS


UNIT IV   MULTI RESOLUTION ANALYSIS AND COMPRESSIONS


UNIT V   APPLICATIONS OF IMAGE PROCESSING


Total : 45 Periods

REFERENCES

UNIT I  DATA WAREHOUSING  


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  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