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TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE : 70
### ELECTIVES FOR FIRST SEMESTER

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SEMESTER - I
MA0533 MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

UNIT 1 – LOGIC

UNIT 2–COMBINATORICS
Mathematical Induction – Pigeonhole principle – Principle of inclusion and exclusion.

UNIT 3 - RECURSIVE FUNCTIONS
Recurrence relation – Solution of recurrence relation using characteristic polynomial and using generating function – Recursive functions – Primitive recursive functions, Computable and non computable functions.

UNIT 4 – ALGEBRAIC STRUCTURES
Groups – Definition and examples only – Cyclic groups – Permutation group (Sn and Dn) – Subgroups – Homomorphism and Isomorphism – Cosets – Lagrange’s Theorem – Normal subgroups – Cayley’s representation theorem.

UNIT 5–LATTICES
Partial order relations, poset – Lattices, Hasse diagram – Boolean algebra.

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
To study advanced representations in Data structures and algorithms

INSTRUCTIONAL OBJECTIVES
• To learn about Linear and Non linear data structures
• To learn the representations and notations used in data structures
• To learn the various analysis of algorithms
• Study of memory management schemes

UNIT – 1 INTRODUCTION
Abstract Data Types - Time and Space Analysis of Algorithms - Big Oh and Theta Notations – Average, best and worst case analysis - Simple recurrence relations and use in algorithms – Mappings

UNIT – 2 LINEAR DATA STRUCTURES

UNIT – 3 NON-LINEAR DATA STRUCTURES

UNIT – 4 ANALYSIS AND DESIGN OF ALGORITHMS
Algorithms Analysis - Sorting - Searching - Design Techniques - Greedy Methods - Dynamic Programming - Divide and Conquor - Back Tracking - Applications

UNIT - 5 ADVANCED ALGORITHMS

TEXT BOOK

REFERENCE BOOKS

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**PURPOSE**
To learn the advanced concepts of Computer Architecture

**INSTRUCTIONAL OBJECTIVES**
- To learn the parallel models and processors
- Pipelining and scalable architectures
- To learn the multithreaded and data flow architecture

**UNIT - 1 PARALLEL MODELS**

**UNIT - 2 PROCESSORS AND MEMORY HIERARCHY**
Advanced processor technology – Super scalar and vector processors – Memory hierarchy technology, virtual memory technology – cache memory organization – shared – memory organization.

**UNIT – 3 PIPELINING AND SUPERSCALAR TECHNIQUES**
Linear pipeline processors – Nonlinear pipeline processors – Instruction pipeline design Arithmetic pipeline design – Superscalar pipeline design

**UNIT – 4 PARALLEL AND SCALABLE ARCHITECTURE**
Multiprocessor system interconnects – Cache coherence, Vector processing principle Compound Vector processing, SIMD computer organization, multiprocessor operating system, multiprocessor examples

**UNIT – 5 SCALABLE, MULTITHREADED & DATA FLOW ARCHITECTURE**
Latency – Hiding techniques – Principles of Multithreading, Scalable and Multithreaded architectures. Dataflow computer, static data flow computer, Dynamic data flow compiler

**TEXT BOOK**

**REFERENCE BOOKS**

CS0517 OBJECT ORIENTED SOFTWARE ENGINEERING L T P C
3 0 3 4

PURPOSE
To learn the advanced software engineering principles and methodologies for effective software development

INSTRUCTIONAL OBJECTIVES
- To learn about software prototyping, analysis and design
- To learn UML and its usage
- Case studies to apply the principles

UNIT - 1 INTRODUCTION

UNIT - 2 PLANNING & SCHEDULING

UNIT - 3 ANALYSIS & DESIGN


UNIT - 4 IMPLEMENTATION & TESTING
Top-Down, Bottom-Up, object oriented product Implementation & Integration. Software Testing methods-White Box, Basis Path-Control Structure –Black Box-Unit Testing- Integration testing- Validation & System testing.Testing OOA & OOD models-Object oriented testing strategies.

UNIT - 5 MAINTENANCE
Maintenance process-System documentation-program evolution dynamics-Maintenance costs-Maintainability measurement – Case Studies

The laboratory shall include development of systems applying the Software Engineering principles and methods for specific applications Lab: 15
TEXT BOOKS

REFERENCE BOOKS

SEMESTER - II
CS0502 DATABASE TECHNOLOGY L T P C
Common for CSE & S/W 3 2 0 4

PURPOSE
This course will provide a comprehensive study of Relational, Distributed and Advanced Database technologies

INSTRUCTIONAL OBJECTIVES
• To learn about ER diagrams, their representation in RDBMS
• To learn the various storage structures for Database
• To study Distributed and Parallel databases
• To learn about Object Oriented databases and Web DB’s

UNIT – 1 DATABASE CONCEPTS
Introduction- Overview of file systems and database systems-Software architecture of a typical DBMS-Data Models ,Schemas and Instances- ER and EER diagrams and Data Flow Diagrams. Database administration and control

UNIT – 2 RELATIONAL CONCEPTS
Introduction to Relational Model, Relational Algebra, Commercial query languages-Case studies- Normalization Techniques.

UNIT – 3 DATABASE STORAGE AND SYSTEM DESIGN
Storage Structures, Indexing and multi dimensional indexes, Query Processing Algorithms, External Sorting, Query Optimization- Heuristic based optimization- cost based optimization, Buffer Management, Concurrency Control, Recovery.

UNIT – 4 DISTRIBUTED DATABASES
Distributed Databases: Query processing, semi-joins, query optimization, distributed and client/server architecture-distributed transactions – Locking and commit protocols-Concurrency control, transaction and recovery Heterogeneity issues
Parallel databases - Parallel Architectures, performance measures, shared nothing/shared disk/shared memory based architectures

UNIT – 5 ADVANCED DATABASE SYSTEMS
TEXT BOOK

REFERENCE BOOKS

CS0504 COMPUTER COMMUNICATION

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PURPOSE
This course provides an understanding of the various principles, protocols and design aspects of Computer Networking.

INSTRUCTIONAL OBJECTIVES
- To study the various Architectures, Data transmission techniques
- To learn the Wide Area and Local Area Networks
- To learn the various communication protocols and applications

UNIT – 1 FUNDAMENTALS
Introduction to Data Communications and Networking overview – Protocol Architecture - ISO-OSI Model – Layers and functionalities

UNIT – 2 DATA COMMUNICATIONS

UNIT – 3 WIDE AREA NETWORKS
WAN – Circuit switching and Packet switching – Asynchronous Transfer Mode – Routing in Switched Networks – Congestion control in switched Data Networks – Cellular Wireless Networks

UNIT – 4 LOCAL AREA NETWORKS
LAN- Local Area Network overview – High-speed LAN’s – Wireless LAN’s

UNIT – 5 COMMUNICATION ARCHITECTURE & PROTOCOLS

TEXT BOOK
## Reference Books


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### Purpose

To learn the Internet Technologies.

### Instructional Objectives

- To learn about Java, HTML, DHTML concepts.
- To know about server-side programming
- Knowledge of XML and its applications

### Unit 1 - Basic Internet Concepts

- History of internet
- Internet addressing
- TCP/IP
- DNS and directory services
- Internet Applications
- Electronic mail, New groups UUCP, FTP, Telnet, Finger.

### Unit 2 - World Wide Web

- Overview – Hyper text markup language
- Uniform Resource Locators
- Protocols
- M Browsers
- Plug-Ins
- Net meeting and Chat
- Search engines.

### Unit 3 - Scripting Languages

- Java Script Programming
- Dynamic HTML
- Cascading style sheets
- Object model and Event model
- Filters and Transitions
- Active X Controls
- Multimedia
- Client side scri.

### Unit 4 - Server Side Programming

- Introduction to Java Servelets
- Overview and architecture
- Handling HTTP get & post request
- Session Tracking
- Multi-tier application
- Implicit objects
- Scripting
- Standard actions
- Directives
- Custom Tag libraries.

### Unit 5 - Web Databases

- Connecting to Databases
- JDBC principles
- Database access
- XML
- Introduction
- Structuring Data
- XML Namespaces
- XML vocabularies
- Web server

Lab 15

Total 60
TEXT BOOK

REFERENCE BOOKS

CS0512 SEMINAR L T P C
0 2 0 1

Students shall be encouraged to choose any latest research topics related to their specialization and present them in the seminar hours.

ELECTIVES FOR FIRST SEMESTER

CS0551 SYSTEM PROGRAMMING L T P C
3 0 0 3

PURPOSE
This course enables to understand the concepts of various System Software

INSTRUCTIONAL OBJECTIVES
• Assemblers, Macros, Loaders and Linkers
• Compiler design principles and techniques

UNIT – 1 INTRODUCTION AND ASSEMBLERS
Language Processor Fundamentals, Assemblers – Elements of assembly language programming, Simple assembly scheme, Pass structure of assemblers, Design of a one & two pass assembler

UNIT – 2 LOADERS AND LINKERS
Macro definition and call, Macro expansion, Nested macro calls, Advanced macro facilities, Design of preprocessor, Relocation and linking concepts, Design of a linker, Self relocating program, Linker for MS-DOS, Linking for overlays, Loaders.

UNIT – 3 COMPILERS – GRAMMERS AND FINITE AUTOMATA

UNIT- 4 PARSING AND SYNTAX DIRECTED TRANSLATION
Parsing: Parsers, Shift-reduce parsing Operator precedence parsing, Top down parsing, Predictive parsing, Syntax directed translation scheme, Intermediate code
UNIT- 5 CODE OPTIMIZATION TECHNIQUES  
Optimization Techniques : Principal Sources of Optimization, Loop Optimization, DAG Representation of Basic Blocks

Total : 45

TEXT BOOK

REFERENCE BOOK

CS0553 GENETIC ALGORITHMS & MACHINE LEARNING L T P C
3 0 0 3

PURPOSE
This course gives a complete understanding of the concepts of Genetic algorithm

INSTRUCTIONAL OBJECTIVES
- Mathematical foundations for Genetic algorithm, operators
- Applications of Genetic Algorithms
- Genetic based machine learning and its applications

UNIT- 1 INTRODUCTION TO GENETIC ALGORITHM 9

UNIT – 2 MATHEMATICAL FOUNDATIONS 7
The fundamental theorem - Schema processing at work. – The 2-armed & k-armed Bandit problem. –The building Block Hypothesis. – Minimal deceptive problem.

UNIT – 3 GA OPERATORS 11

UNIT – 4 APPLICATIONS OF GA 11

UNIT –5 APPLICATIONS OF GENETICS-BASED MACHINE LEARNING 7
The Rise of GBMC – Development of CS-1, the first classifier system. – Smitch’s Poker player. – Other Early GBMC efforts. – Current Applications.

Total 45

TEXT BOOKS

REFERENCE BOOK

CS0623 COMPONENT BASED SYSTEM DESIGN L T P C (Common for CSE and S/W Engg.) 3 0 0 3

PURPOSE
This course enable us to understand the concept of Component and its representation in languages and packages

INSTRUCTIONAL OBJECTIVES
• Fundamentals of Component Based Development
• Design of software components and management
• CORBA ,COM , EJB technologies

UNIT—1 BASIC CONCEPTS 9
Software Components—Component models and Component Services—myths in Component Based Technology—Risk Factors—Success Factors ,Component Based Software Development.

UNIT – 2 COMPONENTS ,ARCHITECTURE AND PROCESS 9
Component Architecture, Component Frameworks, Component Development, Component distribution and acquisition , Component assembly , markets and components

UNIT—3 DESIGN OF SOFTWARE COMPONENT 9
Software Components and the UML Component Infrastructures—Business Components—Components and Connectors—Designing Models of Modularity & Integration.

UNIT—4 MANAGEMENT OF COMPONENT BASED SOFTWARE SYSTEMS 9
Measurement and Metrics for Software Components—Selecting the right Components—Software Component Project Management—Trouble with Testing Components—Configuration
UNIT—5 COMPONENT TECHNOLOGIES
Overview of the Following Component Models: CORBA, COM+, Enterprise Java Beans, Software Agents.

TEXT BOOK

REFERENCE BOOKS

CS0651 NEURAL NETWORKS PROGRAMMING TECHNIQUES

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PURPOSE
To study the Artificial Neural Networks and its applications in computer field

INSTRUCTIONAL OBJECTIVES
- To learn the basics of ANN and comparing with Human brain
- To learn the various architectures of building an ANN and its applications
- To learn the pattern classification techniques, advanced methods of representing information in ANN

UNIT—1 INTRODUCTION TO ANN TECHNOLOGY
Elementary Neurophysiology—From Neuron to ANS—Adaline and Madaline

UNIT—2 BACK PROPAGATION
Back Propagation Network—The Generalized Delta Rule—Practical Considerations—Applications—BAM and Hopfield Memory—simulating the BAM.

UNIT—3 SIMULATED ANNEALING

UNIT—4 SELF—ORGANIZING MAP
SOM Data Processing—Applications of Self—Organizing Maps—Simulating the SOM. Adaptive Resonance Theory : ART Network Description—ART1—ART2.
UNIT—5 SPATIOTEMPORAL PATTERN CLASSIFICATION 9

TEXT BOOK

REFERENCE BOOKS
2. J.M.Zurada, "Introduction to Artificial Neural Networks“, Jaico Publishing House., 1997

CS0685 MULTIMEDIA SYSTEMS L T P C
(Common for CSE and S/W Engg.) 3 0 0 3

PURPOSE
To study the tools and applications of Multimedia Systems

INSTRUCTIONAL OBJECTIVES
• To learn the devices and tools for generating and representing multimedia
• To study the text and images in multimedia
• Learning how to organize the Multimedia Project and building intelligent systems

UNIT - 1 INTRODUCTION 9
Introduction - Multimedia applications – architecture and issues for distributed multimedia systems – multimedia skills – digital audio representations and processing – video technology.

UNIT - 2 MULTIMEDIA HARDWARE AND SOFTWARE 9

UNIT – 3 AUDIO, DIGITAL VIDEO AND IMAGE COMPRESSION 9

UNIT - 4 MULTIMEDIA BUILDING BLOCKS 9
UNIT – 5 MULTIMEDIA INFORMATION SYSTEM
Operating system support for continuous media applications – middleware system service
architecture – multimedia device, presentation services and user interface – multimedia file
systems and information model.

Total : 45

TEXT BOOK

REFERENCE BOOKS

CS0009 / CS810 DISTRIBUTED FILE SYSTEM

PURPOSE
This course provides an in-depth knowledge of File sharing which take place in different types of
networks

INSTRUCTIONAL OBJECTIVES
• Basic introduction to Distributed file System.
• Designing distributed File System.
• Issues of file sharing in MANET

UNIT – 1 OVERVIEW OF DISTRIBUTED FILE SYSTEM
Introduction to distributed file system-Design issues of DFS-Trends in distributed file system-Peer
to Peer networks-characteristics of peer to peer networks

UNIT – 2 DESIGNING FILE SYSTEM IN DISTRIBUTED NETWORKS
Designing Distributed file system(DFS)-DFS Scenarios-Features of DFS-Feature requirement of
DFS-Design process of DFS

UNIT – 3 CONCEPTS RELATED TO FILE SHARING IN MANET
Issues in sharing files in MANET-Data replication-Issues in data replication-Pessimistic
replication-primary copy tokens ,voting-Optimistic replication- replica state ,version ,time
UNIT – 4 PERFORMANCE ISSUES OF FILE SHARING IN MANET

UNIT – 5 RELATED WORK
A special purpose peer to peer file sharing system for MANET-A distributed service discovery model for MANET-Peer to Peer file sharing over MANET-Efficient peer to peer information sharing over mobile ad hoc networks-Cluster based replication for large scale MANET-Trusted application centric ad hoc networks

REFERENCES

- Andrew S Tanenbaum, "Distributed Operating Systems ", Pearson Education India, 2001
- A Distributed File System for Mobile Ad-hoc Networks João Pedro Faria Mendonça Barreto (Licenciado) funded by Microsoft research
- Alexander Klemm, Christoph Lindemann, and Oliver P. Waldhorst,” A Special-Purpose Peer-to-Peer File Sharing System for Mobile Ad Hoc Networks”, 2003 IEEE.
- Cristian Borcea, and Liviu Ifode,Gang Xu,” Trusted Application-Centric Ad-Hoc Networks”, This work was supported in part by the NSF grants CCR-0133366,ANF-0121416, CNS-0520123 and CNS-0520033,IEEE 2007.
ELECTIVES FOR SECOND SEMESTER

MA0553 DISCRETE MATHEMATICS

L T P C
3 0 0 3

PURPOSE
To impart to the students of Engineering, the rudiments of Mathematics so as to enable them to apply the same for their own branch.

INSTRUCTIONAL OBJECTIVES
To equip the students of Engineering, the knowledge of Mathematics and its applications so as to enable them to apply them for the branch in which they are admitted.

UNIT - 1 MATHEMATICAL LOGIC
9
UNIT - 2  SET THEORY

UNIT - 3  RECURRENCE RELATION & ALGEBRAIC SYSTEMS
Groups – Cyclic groups and subgroups – Normal subgroups – Coding theory – Group codes.

UNIT - 4  GROUPS
Groups – Cyclic groups and subgroups – Normal subgroups – Coding theory – Group codes.

UNIT - 5  BOOLEAN ALGEBRA & FORMAL LANGUAGES
Boolean algebra – Posets – Lattices – Application of Boolean Algebra to switching theory.
Languages – Recognition and generation - Phase structure grammars and languages – Finite state Machine – Recognition in regular languages.

Total 45

TEXT BOOK

REFERENCE BOOKS

CS0560  FUZZY LOGIC
L T P C
3 0 0 3

PURPOSE
This course presents a detailed knowledge of Fuzzy logic principles, systems and its applications.

INSTRUCTIONAL OBJECTIVIES
• Fuzzy sets and representations
• Fuzzy Relation and Logic
• Fuzzy systems and Application

UNIT- 1  INTRODUCTION
UNIT - 2 FUZZY RELATIONS AND MEMBERSHIP FUNCTIONS

UNIT - 3 FUZZIFICATION AND FUZZY ARITHMETIC
Lambda-cuts for fuzzy sets-lambda cuts for fuzzy relations- defuzzification methods-Extension principle-functions of fuzzy sets- fuzzy transform-fuzzy numbers-appropriate methods of extension-vertex method-DSW algorithm

UNIT - 4 FUZZY LOGIC AND FUZZY RULE BASED SYSTEMS
Fuzzy logic –approximate reasoning-fuzzy tautologies-contradictions-equivalence-and logical proofs-other forms of implication operation and composition operation

UNIT - 5 APPLICATIONS
Linguistic hedges-rule based systems-fuzzy associative memories-multiobjective decision making –fuzzy bayesian decision method.

TEXT BOOK

REFERENCE BOOKS

CS0562 DIGITAL IMAGE PROCESSING L T P C
3 0 0 3

PURPOSE
This course provides a complete understanding of the various image processing techniques

INSTRUCTIONAL OBJECTIVES
- Image fundamentals and techniques
- Image transforms, enhancement, restoration and compression
- Image reconstruction operations

UNIT - 1 DIGITAL IMAGE FUNDAMENTALS
UNIT- 2 IMAGE ENHANCEMENT
Spatial Domain : Gray level transformations – Histogram processing – using Arithmetic / Logic operations.
Frequency Domain : Introduction to Fourier Transform – Smoothing and Sharpening frequency domain filters. – Implementations.

UNIT- 3 IMAGE RESTORATION

UNIT- 4 IMAGE COMPRESSION

UNIT- 5 IMAGE SEGMENTATION AND REPRESENTATION
Point detection – Line detection – Edge detection – Boundary detection – Thresholding – Region-based segmentation; Representation – Boundary descriptors – Regional descriptors

Total : 45

TEXT BOOK

REFERENCE BOOKS

CS0564 VIRTUAL REALITY TECHNOLOGY L T P C
3 0 0 3

PURPOSE
This course provides a detailed understanding of the concepts of Virtual Reality and its application

INSTRUCTIONAL OBJECTIVES
- Geometric modeling and Virtual environment
- Virtual Hardware and Software
- Virtual Reality applications

UNIT – 1 INTRODUCTION

UNIT – 2 GEOMETRIC MODELING

UNIT – 3 VIRTUAL ENVIRONMENT

UNIT – 4 VR HARDWARE & SOFTWARES

UNIT – 5 VR APPLICATION

Total 45

TEXT BOOK

REFERENCE BOOKS

CS0578 HUMAN INTERFACE SYSTEM DESIGN
(Common for CSE and S/W Engg.)

L T P C
3 0 0 3

PURPOSE
This course on user Interface Design provides a basic understanding of interface design and principles

INSTRUCTIONAL OBJECTIVES
• Design process management
• Interaction devices and windows strategies
• Managing virtual environments

UNIT - 1 INTRODUCTION
Goals of System Engineering – Goals of User Interface Design – Motivations of Human factors in Design – High Level Theories – Object-Action Interface Design - Three Principles – Guidelines for Data Display and Data Entry

UNIT - 2 MANAGING DESIGN PROCESS

UNIT - 3 MANIPULATION AND VIRTUAL ENVIRONMENTS

UNIT - 4 INTERACTION DEVICES

UNIT- 5 WINDOWS STRATEGIES AND INFORMATION SEARCH

Total : 45

TEXT BOOK

REFERENCE BOOKS

CS0516 DISTRIBUTED OPERATING SYSTEMS

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Common for CSE & S/W

PURPOSE
This course provides and in-depth knowledge of Advanced Operating System concepts

INSTRUCTIONAL OBJECTIVES
• Basic introduction to Operating System principles
• Distributed Computing techniques, Synchronous and Processes
• Shared Data access, Files, Case study

UNIT -1 OVERVIEW OF OPERATING SYSTEMS
Introduction – overview of operating system concepts – Process management and Scheduling, Memory management: partitioning, paging, segmentation, virtual memory, Device and File management.

UNIT -2 DISTRIBUTED COMPUTING

UNIT -3 SYNCHRONIZATION AND PROCESSES

UNIT - 4 SHARED MEMORY AND FILE SYSTEMS

UNIT - 5 CASE STUDY – AMOEBA
Introduction to Amoeba – Object and Capabilities – memory management – Communication – Amoeba Servers.

Total 45

TEXT BOOK

REFERENCE BOOKS

CS0621 SOFTWARE QUALITY MANAGEMENT L T P C
(Common for CSE and S/W Engg) 3 0 0 3

PURPOSE
This course deals with improving the quality of software and managing them

INSTRUCTIONAL OBJECTIVES
• Principles of Software quality and concepts
- Quality Assurance models
- Total Quality Management

UNIT - 1 INTRODUCTION  
Concepts of Quality Control, Quality Assurance, Quality Management - Total Quality Management; Cost of Quality; QC tools - 7 QC Tools and Modern Tools; Other related topics - Business Process Re-engineering - Zero Defect, Six Sigma, Quality Function Deployment, Benchmarking, Statistical process control.

UNIT - 2 SOFTWARE ENGINEERING PRINCIPLES  

UNIT - 3 SOFTWARE QUALITY ASSURANCE MODELS  

UNIT - 4 SOFTWARE PROCESSES & TESTING  
Software Process - Definition and implementation; internal Auditing and Assessments; Software testing - Concepts, Tools, Reviews, Inspections & Walkthroughs; P-CMM.

UNIT - 5 TQM  

TEXT BOOKS  

REFERENCE BOOKS  

ELECTIVES FOR THIRD SEMESTER  
CS0530 SOFTWARE RELIABILITY L T P C 
(Common for CSE and S/W Engg.) 3 0 0 3

PURPOSE
This course gives a thorough knowledge of providing software reliability.

INSTRUCTIONAL OBJECTIVES

- Software Reliability.
- Reliability approaches
- Reliability models

UNIT - 1 INTRODUCTION TO RELIABILITY ENGINEERING

Reliability — Repairable and Non Repairable systems — Maintainability and Availability — Designing for higher reliability — Redundancy — MTBF — MTTF MDT - MTTR— k out of in systems

UNIT-2 SOFTWARE RELIABILITY


UNIT - 3 SOFTWARE RELIABILITY APPROACHES

Fault Avoidance — Passive Fault detection — Active Fault Detection — Fault Tolerance - Fault Recovery - Fault Treatment

UNIT - 4 SOFTWARE RELIABILITY MODELING

Introduction to Software Reliability Modeling – Parameter Determination and Estimation - Model Selection – Markovian Models – Finite and Infinite failure category Models – Comparison of Models – Calendar Time Modeling

UNIT - 5 SPECIAL TOPICS IN SOFTWARE RELIABILITY


Total:45

TEXT BOOKS


REFERENCE BOOKS


CS0601 WIRELESS COMMUNICATION AND NETWORKS L T P C

3 0 0 3

PURPOSE
To learn the standards and issues in Wireless and Mobile Computing

**INSTRUCTIONAL OBJECTIVES**

- To study the standards of Wireless LAN, Sensor and ADHOC networks
- To learn about Mobile nodes and IP
- To study the latest protocols and applications of wireless and Mobile standards

**UNIT – 1 WIRELESS TRANSMISSION FUNDAMENTALS**

Introduction to wireless transmission—signal propagation—Multiplexing-Modulation-Spread Spectrum-Fading-Coding and Error control.

**UNIT – 2 MAC, TELE COMMUNICATION AND SATELLITE SYSTEMS**

Medium access Control Techniques- SDMA-TDMA-FDMA- CDMA- Comparison.
Tele communication systems- GSM-DECT and TETRA.
Satellite Systems- Routing, Localization and hand over.

**UNIT – 3 WIRELESS LANS**

Wireless LAN Technology-IEEE 802.11 Standards-HIPER LAN and Bluetooth-Role of Wireless local loops.

**UNIT – 4 WIRELESS ATM AND MOBILE NETWORK LAYER**


**UNIT – 5 MOBILE TRANSPORT LAYER AND SUPPORT FOR MOBILITY**


**TEXT BOOK**

1. J.Schiller, “Mobile Communications”, Addition Wesley, 2000

**REFERENCE BOOKS**


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**CS0603 TCP/IP TECHNOLOGY**

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PURPOSE
This course gives a complete understanding of TCP / IP Technology

INSTRUCTIONAL OBJECTIVES
- To study the standards of TCP / IP protocol and addressing
- Study of various protocols like ARP, RARP, UDP, ICMP, TGMP
- Multicasting protocols, sockets

UNIT – 1 INTRODUCTION

UNIT – 2 IP ADDRESSES, ROUTING, ARP AND RARP

UNIT – 3 IP, ICMP, TGMP AND UDP

UNIT – 4 TCP, UNICAST AND MULTICAST ROUTING PROTOCOLS

UNIT – 5 APPLICATION LAYER, SOCKETS

TEXT BOOK

REFERENCE BOOK

Total : 45
PURPOSE
To study the Pattern Recognition techniques and its applications

INSTRUCTIONAL OBJECTIVES
- To learn the basics of Pattern Classifier
- To learn Feature extraction, Classification and Recognition techniques
- To learn recent advances in pattern classification

UNIT - 1  PATTERN RECOGNITION OVERVIEW
Pattern recognition, Classification and Description—Patterns and feature Extraction with Examples—Training and Learning in PR systems—Pattern recognition Approaches

UNIT - 2  STATISTICAL PATTERN RECOGNITION
Introduction to statistical Pattern Recognition—supervised Learning using Parametric and Non Parametric Approaches.

UNIT - 3  LINEAR DISCRIMINANT FUNCTIONS AND UNSUPERVISED LEARNING AND CLUSTERING
Introduction—Discrete and binary Classification problems—Techniques to directly Obtain linear Classifiers—Formulation of Unsupervised Learning Problems—Clustering for unsupervised learning and classification.

UNIT - 4  SYNTACTIC PATTERN RECOGNITION
Overview of Syntactic Pattern Recognition—Syntactic recognition via parsing and other grammars—Graphical Approaches to syntactic pattern recognition—Learning via grammatical inference.

UNIT - 5  NEURAL PATTERN RECOGNITION
Introduction to Neural networks—Feedforward Networks and training by Back Propagation—Content Addressable Memory Approaches and Unsupervised Learning in Neural PR.

TEXT BOOK

REFERENCE BOOKS
5. C.M.Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.
PURPOSE
This course enable us to understand the concepts of Data Warehousing and Data Mining And its applications

INSTRUCTIONAL OBJECTIVES
- OLTP and Developing a Data Warehouse
- Data mining techniques and algorithms
- Data Mining environments and applications

UNIT-1 INTRODUCTION

UNIT- 2 DESIGN ASPECTS

UNIT- 3 HARDWARE
Hardware and operational design – server hardware, network hardware – parallel technology – security input on design of Hardware – backup and recovery – Service level agreement – Operating the data warehouse.

UNIT-4 PLANNING AND DEVELOPMENT

UNIT-5 MINING ENVIRONMENT
Data Mining Environment: Case studies in building business environment, Application of data ware housing and Data mining in Government, National Data ware houses and case studies.

TEXT BOOKS

REFERENCE BOOKS
PURPOSE
This course enables us to understand the concepts of Real time systems and its applications.

INSTRUCTIONAL OBJECTIVES
- Basics of Real time systems
- Real time programming tools and Databases
- Fault tolerance, Reliability and Synchronization

UNIT – 1  Introduction  6

UNIT – 2  Task Assignment and Scheduling  10

UNIT- 3  Programming Languages and Tools  6

UNIT- 4  REAL TIME DATABASES  12

UNIT- 5  FAULT TOLERANCE, REABILITY AND SYNCHRONIZATION  11

Total: 45

TEXT BOOK

REFERENCE BOOKS
PURPOSE
This course provides a way to understand the various security techniques in networks.

INSTRUCTIONAL OBJECTIVES
- Encryption techniques and key generation techniques
- Authentication and security measures
- Intrusion and filtering analysis

UNIT – 1 CONVENTIONAL AND MODERN ENCRYPTION

UNIT – 2 PUBLIC KEY ENCRYPTION

UNIT – 3 AUTHENTICATION

UNIT – 4 SECURITY PRACTICE

UNIT – 5 SYSTEM SECURITY

TEXT BOOK

REFERENCE BOOKS

Total: 45
CS0689  EMBEDDED TECHNOLOGY  L  T  P  C

3   0   0   3

PURPOSE
To study the architecture of microcontrollers and embedded microcomputer systems.

INSTRUCTIONAL OBJECTIVES
- To understand the architecture of PIC microcontroller
- To understand the architectures and applications of embedded microprocessor based systems.
- To know cross compilers and debugging strategies
- To understand the basic design issues of real time OS

UNIT - 1  REVIEW OF EMBEDDED HARDWARE  9

UNIT - 2  MICROCHIP PIC MICRO CONTROLLER  9
Serial EEPROM – Analog to Digital Converter – UART – Baud Rate – Data Handling

UNIT - 3  EMBEDDED MICROCOMPUTER SYSTEM  9

UNIT - 4  SOFTWARE DEVELOPMENT  9

UNIT - 5  REAL TIME OPERATING SYSTEM  9

TOTAL 45

TEXT BOOKS

REFERENCE BOOKS

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**PURPOSE**
To study the Fault tolerance systems architecture and its techniques

**INSTRUCTIONAL OBJECTIVES**
- To understand the error model and its operation
- Fault tolerance and architecture
- Fault tolerant software

**UNIT - 1 INTRODUCTION**

**UNIT- 2 ERROR MODEL**

**UNIT- 3 FAULT TOLERANCE**
Coding technique-fault tolerant self checking and fail safe circuits-fault tolerant in combinatorial and sequential circuits- synchronous and asynchronous fail safe circuits.

**UNIT- 4 ARCHITECTURE**
Fault tolerant computers - general purpose commercial systems-fault tolerant multiprocessor and VLSI based communication architecture.

**UNIT- 5 FAULT TOLERANT SOFTWARE**
Design-N-version programming recovery block - acceptance tests-fault trees- validation of fault tolerant systems.

**TEXT BOOKS**
1. K.K. Pradhan, “Fault Tolerant computing theory and techniques” volume III. PHI’89

**REFERENCE BOOKS**
CS0693 GRID COMPUTING L T P C 3 0 0 3

PURPOSE
This course provides a way to understand the Grid computing technology and its applications

INSTRUCTIONAL OBJECTIVES
• Types of Grids and its architecture
• Open Grid Service Architecture and management
• Parallel computing environment, Grid services and applications

UNIT- 1 INTRODUCTION
Grid Computing values and risks – History of Grid computing – Grid computing model and protocols – overview of types of Grids

UNIT- 2 TYPES OF GRIDS
Desktop Grids: Background – Definition – Challenges – Technology – Suitability – Grid server and practical uses; Clusters and Cluster Grids; HPC Grids; Scientific in sight – application and Architecture – HPC application development environment and HPC Grids; Data Grids; Alternatives to Data Grid – Data Grid architecture

UNIT – 3 ARCHITECTURE AND MANAGEMENT

UNIT – 4 NATIVE PROGRAMMING AND SOFTWARE APPLICATIONS
Grid enabling software applications – Needs of the Grid users – methods of Grid deployment – Requirements for Grid enabling software – Grid enabling software applications

UNIT – 5 APPLICATIONS, SERVICES AND ENVIRONMENTS

Total 45

TEXT BOOK

REFERENCE BOOKS
2. Foster, “Grid Blue print foe new computing”

CS0695 INTELLIGENT SYSTEMS  
L T P C  
3 0 0 3  

PURPOSE
This course provides a way to understand the concepts of Artificial Intelligence, ANN, Genetic Algorithms and Fuzzy systems and its applications.

INSTRUCTIONAL OBJECTIVES
- Basics of AI and ANN
- Neuro fuzzy systems and its applications
- Genetics algorithms and its applications

UNIT-1 ARTIFICIAL INTELLIGENCE  
Some Applications of AI-Production Systems and AI-Different types of Production Systems-Search Strategies for AI-Backtracking-Graph-search, Ununiformed and Heuristic Graph-Search Procedures-Related Algorithms-Applications.

UNIT-2 INTRODUCTION TO NEURAL COMPUTING  
Differences between Human Brain and ANN - Knowledge Based Information Processing-Neural Information Processing - Hybrid Intelligence - Basic Concepts of Neural Networks - Inference and Learning - Classification, Association, Optimization and Self-Organization Models-Learning-Supervised And Unsupervised.

UNIT-3 FUZZY SYSTEMS  
Crisp sets and Fuzzy sets-Notion of Fuzzy Sets - Basic Concepts - Operations on Fuzzy sets-Uncertainty and Information – Types of Uncertainty –Principles of Uncertainty and Information –Applications

UNIT-4 NEURO-FUZZY SYSTEMS  
Introduction to Neuro - Fuzzy Systems -Fuzzy System Design Procedures – Fuzzy Sets and Logic Background - Fuzzy / ANN Design and Implementation

UNIT- 5 GENETIC ALGORITHMS  
Introduction-Robustness of Traditional Optimization and Search Techniques-The goals of optimization-Computer Implementation-Applications

Total:45

TEXT BOOKS

REFERENCE BOOKS

CS0696   NATURAL LANGUAGE UNDERSTANDING   L   T   P   C
                      3   0   0   3

PURPOSE
This course on Natural language Processing gives a better understanding of the machine translation of natural languages

INSTRUCTIONAL OBJECTIVES
- Understanding of NLP with respect to English language syntax and semantics
- Context and world knowledge
- Approaches to machine translation

UNIT-1 INTRODUCTION  9
Natural Language Understanding – The Different levels of Language Analysis – Representation and Understanding – the Organization of Natural Language Understanding Systems.

UNIT- 2 LINGUISTIC BACK GROUND  9

UNIT – 3 FEATURES AND AUGMENTED GRAMMARS  9

UNIT - 4 SEMANTIC INTERPRETATION  9
Semantic Interpretation and Compositionality – Lexicalized Semantic Interpretation and Semantic roles - semantic Interpretation Using Feature Unification. A Representation Based on FOPC – Handling Natural Language Quantification.

UNIT- 5 TECHNIQUES  9

Total: 45

TEXT BOOK

REFERENCE BOOKS
2. Winograd, “Language as a cognitive process- syntax”, Addison Wesley

<table>
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<td>To study the various Text Mining techniques and applications</td>
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INSTRUCTIONAL OBJECTIVES
- Natural Language processing, Techniques
- Text based categorization & search
- Lexical semantics & Knowledge discovery in databases

UNIT 1 NATURAL LANGUAGE PROCESSING

UNIT 2 NLP TOOLS AND RESOURCES
Role of NLP in Text retrieval – NLP for term variant Extraction; synergy between morphology, Lexicon and syntax using NLP or NLP Resources for information Retrieval tasks. Evaluating NLP Techniques in information retrieval. An NLP tool set to support Boolean retrieval.

UNIT 3 TEXT CATEGORIZATION, CLASSIFICATION & ROUTING

UNIT 4 LEXICAL SEMANTICS

UNIT 5 KNOWLEDGE DISCOVERY & APPLICATIONS OF TEXT MINING

TOTAL 45

TEXT BOOKS
3. ‘Speech and Language Processing: An introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition’ Daniel Jurafskes and James H. Martain, 2000
5. Fast and effective text mining using linear – time document clustering; bjorar Larsen and chinatsu Aone ; Proceedings of fifth ACM SIGKDD international conference on Knowledge discovery and data mining, 1999 pp16-22

CS0005 / CS803 WIRELESS SENSOR NETWORKS L T P C
3003

PURPOSE
To study the various Sensor networks, tools and techniques for implementation

INSTRUCTIONAL OBJECTIVES
• Sensor Networks, Models, Network Sensor
• Sensor tasking and Control, Sensor network databases
• Sensor network platforms and tools

UNIT –1 INTRODUCTION TO SENSOR NETWORKS.

UNIT – 2 NETWORK SENSOR

UNIT – 3 INFRASTRUCTURE ESTABLISHMENT, SENSOR TASKING AND CONTROL

UNIT – 4 SENSOR NETWORK DATA BASES
Sensor Data base challenges – Querying the Physical Environment – Query Interfaces – High level Data Base organization – In Network aggregation – Data Centric storage – Data indices and Range queries – Distributed hierarchical aggregation – temporal Data

UNIT – 5 SENSOR NETWORK PLATFORMS AND TOOLS.

TOTAL 45
TEXT BOOK

REFERENCE BOOK

CS0006 / CS804 SECURITY ISSUES IN AD-HOC NETWORKS L T P C 3 0 0 3

PURPOSE
To study the various security issues in AD-Hoc Networks, routing, protocols, detection and prevention

INSTRUCTIONAL OBJECTIVES
• Basic Security concepts, and Secure Routing
• Secure Routing, Protocols, Data Communication in Adhoc networks
• Detection and Preventions of Attacks

UNIT – 1 BASIC SECURITY CONCEPTS

UNIT – 2 SECURE ROUTING

UNIT – 3 ROUTING PROTOCOLS

UNIT – 4 HYBRID SOLUTIONS,SMT,SSP
Game theory solutions – Limitations - Hybrid Solutions to security. Other proposed schemes in security. Secure Data Communication in Mobile Ad hoc Networks. SMT and SSP protocols
UNIT – 5 DETECTION AND PREVENTION

TOTAL 45

REFERENCES
3. Younghwan Yoo And Dharma P. Agrawal Why Does It Pay To Be Selfish In A Manet, IEEE Wireless Communications, December 2006

CS0007 / CS806 TRUST COMPUTING

PURPOSE
To study the Trust management techniques for distributed computing environment

INSTRUCTIONAL OBJECTIVES
- Logic programming, trust management approaches
- Distributed trust model, design and its management in ad hoc networks

UNIT – 1 LOGIC PROGRAMMING
Introduction
Basics of logic and logic programming – definite logic programs – SLD resolution principle.

UNIT – 2 TRUST MANAGEMENT APPROACHES
Overview of trust management approach - Distributed authorization – trust management approach – characteristics – Public Key Certificates – Existing Public key infrastructures – X.509 and PGP.

UNIT – 3 TRUST MANAGEMENT LANGUAGES
Early trust management languages and approaches - PolicyMaker – KeyNote – SPKI(Simple Public Key Infrastructure) – Simple Distributed Security Infrastructure (SDSI) – Datalog based trust management languages – other closely related logic based security languages.

UNIT – 4 DISTRIBUTED TRUST MODEL & DESIGN
Decentralized trust management - Distributed credential chain discovery in trust management – Design of a role based trust management framework. - Distributed trust model

UNIT – 5 TRUST MODELING AND MANAGEMENT IN AD HOC NETWORKS
Related Work on Trust Modeling and Management in Ad hoc Networks

TOTAL 45
REFERENCES
PURPOSE
To study the Mobile Adhoc networks, its protocols and applications

INSTRUCTIONAL OBJECTIVES
- Adhoc routing protocols and algorithms
- Transport layer security protocols
- Quality of service in Manets, and, Soft computing techniques

UNIT – 1 INTRODUCTION

UNIT – 2 AD HOC ROUTING PROTOCOLS AND ALGORITHMS

UNIT- 3 TRANSPORT LAYER, SECURITY PROTOCOLS

UNIT – 4 SOFT COMPUTING

UNIT – 5 QOS IN MANET

TOTAL 45

TEXT BOOKS:

REFERENCE BOOKS:

CS0010 / CS812 TEST AND MEASUREMENTS OF COMMUNICATION NETWORK

PURPOSE:
This course provides an understanding of the testing and measurement techniques of communication network.

INSTRUCTIONAL OBJECTIVES:
- To learn the cellular network measurements and testing techniques
- To learn the network test instruments
- To learn the network management and performance monitoring

UNIT-1 INTRODUCTION TO NETWORK TEST AND MEASUREMENTS
Introduction to telecommunication network measurements – Testing in the life cycle of the network - Private network performance testing

UNIT -2 CELLULAR NETWORK MEASUREMENTS AND TESTING
Introduction to cellular radio network - Cellular measurement strategies - Cellular measurement description - Cellular network life cycle testing

UNIT- 3 BASIC TELECOMMUNICATION TECHNOLOGIES
Transmission media characteristics and measurement - Fiber optic network elements Timing and delay jitter - Protocol analysis

UNIT- 4 NETWORK TEST INSTRUMENTS

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Analog measurement instrumentation - Bit error rate measurement and error performance analysis
- Protocol analyzers - Optical testers - Distributed network monitoring - SDH and sonnet analyzers
- Signaling system 7 testing

UNIT – 5 NETWORK MANAGEMENT
Local area network management and performance monitoring - SS7 signaling monitoring system

TEXT BOOK

REFERENCES
OBJECTIVES
The objective is to acquaint the students with the knowledge and use of computers and simple applications of computers in managerial decisions.

COURSE CONTENTS