S.R.M. UNIVERSITY

FACULTY OF ENGINEERING AND TECHNOLOGY

SCHOOL OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

S.R.M. UNIVERSITY – FACULTY OF ENGINEERING AND TECHNOLOGY

PROGRAMME: M.TECH (CSE) – PART TIME

CURRICULUM AND SYLLABUS
### I SEMESTER

<table>
<thead>
<tr>
<th>COURSE CODE</th>
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<td>MA533</td>
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TOTAL CREDITS TO BE EARNED FOR THE AWARD OF THE DEGREE : 71
### ELECTIVES FOR SECOND SEMESTER

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### SCHEME OF EXAMINATION

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4
UNIT I – LOGIC

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

UNIT III - 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 IV – 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 V – LATTICES
Partial order relations, poset – Lattices, Hasse diagram – Boolean algebra.

TUTORIAL 15
TOTAL 60

TEXT BOOKS

REFERENCE BOOKS
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 I  PARALLEL MODELS  9

UNIT II  PROCESSORS AND MEMORY HIERARCHY  9
Advanced processor technology – Super scalar and vector processors – Memory hierarchy technology, virtual memory technology – cache memory organization – shared – memory organization.

UNIT – III PIPELINING AND SUPERSCALAR TECHNIQUES  9
Linear pipeline processors – Nonlinear pipeline processors – Instruction pipeline design
Arithmetic pipeline design – Superscalar pipeline design

UNIT – IV PARALLEL AND SCALABLE ARCHITECTURE  9
Multiprocessor system interconnects – Cache coherence, Vector processing principle
Compound Vector processing, SIMD computer organization, multiprocessor operating system, multiprocessor examples

UNIT – V SCALABLE, MULTITHREADED & DATA FLOW ARCHITECTURE  9
Latency – Hiding techniques – Principles of Multithreading, Scalable and Multithreaded architectures. Dataflow computer, static data flow computer, Dynamic data flow compiler, VLSI computing structure

Tutorial 15
Total 60

TEXT BOOK

REFERENCE BOOKS
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 I INTRODUCTION

UNIT II PLANNING & SCHEDULING

UNIT III ANALYSIS & DESIGN

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

Tutorial 15
Total 60
TEXT BOOKS

REFERENCE BOOKS
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 – I 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 – II RELATIONAL CONCEPTS
Introduction to Relational Model, Relational Algebra, Commercial query languages-Case studies-Normalization Techniques.

UNIT – III 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 – IV DISTRUBUTED 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 – V ADVANCED DATABASE SYSTEMS
OODBMS - ORDBMS- Deductive databases- data mining and warehousing-temporal and spatial databases-mobile databases.

TEXT BOOK
REFERENCE BOOKS

CS505 DATA STRUCTURES AND ALGORITHMS

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 – I 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 – II LINEAR DATA STRUCTURES
Arrays, Lists, Stacks, Queues

UNIT – III NON-LINEAR DATA STRUCTURES

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

UNIT V ADVANCED ALGORITHMS
TEXT BOOK

REFERENCE BOOKS


ELECTIVE – I

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ELECTIVE – I

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(Common for CSE and S/W Engg.)

PURPOSE
This laboratory course gives a complete understanding of the practical application of Software Engineering principles and methods.

Develop the following software using Software Engineering Methodology:

1. Student Course Registration.
2. Payroll Processing Application.
4. Library Management System.
5. Railway Reservation System.
7. Cellular Phone.

Total : 45
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 – I FUNDAMENTALS
Introduction to Data Communications and Networking overview – Protocol Architecture - ISO-OSI Model – Layers and functionalities

UNIT – II DATA COMMUNICATIONS

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

UNIT – V COMMUNICATION ARCHITECTURE & PROTOCOLS

TEXT BOOK

REFERENCE BOOKS
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 I 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 II DISTRIBUTED COMPUTING

UNIT III SYNCHRONIZATION AND PROCESSES

UNIT IV SHARED MEMORY AND FILE SYSTEMS

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

TEXT BOOK

REFERENCE BOOKS
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—I BASIC INTERNET CONCEPTS 8
History of internet—Internet addressing—TCP/IP—DNS and directory services—Internet Applications—Electronic mail, New groups UUCP, FTP, Telnet, Finger.

UNIT—II WORLD WIDE WEB 9

UNIT—III SCRIPTING LANGUAGES 9

UNIT IV SERVER SIDE PROGRAMMING 10

UNIT V WEB DATABASES 9
Connecting to Databases—JDBC principles—Database access—XML—Introduction—Structuring Data—XML Namespaces—XML vocabularies—Web server

TEXT BOOKS

REFERENCE BOOKS
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 – I  WIRELESS TRANSMISSION FUNDAMENTALS  9
Introduction to wireless transmission – signal propagation – Multiplexing- Modulation-Spread Spectrum- Fading- Coding and Error control.

UNIT – II MAC, TELE COMMUNICATION AND SATELLITE SYSTEMS   9
Medium access Control Techniques- SDMA-TDMA-FDMA- CDMA- Comparison.
Tele communication systems- GSM-DECT and TETRA.
Satellite Systems- Routing, Localization and hand over.

UNIT – III WIRELESS LANS 9
Wireless LAN Technology- IEEE 802.11 Standards- HIPER LAN and Bluetooth- Role of Wireless local loops.

UNIT – IV WIRELESS ATM AND MOBILE NETWORK LAYER  9

UNIT – V MOBILE TRANSPORT LAYER AND SUPPORT FOR MOBILITY  9

Tutorial: 15
Total: 60

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

REFERENCE BOOKS
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 – I INTRODUCTION

UNIT – II IP ADDRESSES, ROUTING, ARP AND RARP

UNIT – III IP, ICMP, TGMP AND UDP

UNIT – IV TCP, UNICAST AND MULTICAST ROUTING PROTOCOLS

UNIT – V APPLICATION LAYER, SOCKETS

Tutorial :15
Total : 60

TEXT BOOK

REFERENCE BOOK

ELECTIVE – II
One Elective paper should be chosen from the list of subject codes given below

CS560, CS562, CS564, CS578 and CS621

CS510 INTERNET PROGRAMMING LAB L T P C
(Common for CSE and S/W Engg) 0 0 3 2

PURPOSE
This laboratory course gives a complete understanding of the internet programming concepts using Java application, applets, HTML, XML and JSP.

INSTRUCTIONAL OBJECTIVES
- Implementing Java components
- Practicing RMI, JDBC, JSP
- Multithreading and animation concepts

LIST OF EXPERIMENTS
1. Exercises on creating HTML pages
2. Implementation of Package Bio-Data
3. Shapes Class Hierarchy
4. Animation using Java Applets
5. Multi Threaded implementation of Producer Consumer Problem
6. Implementation of simple TCP/IP Client and server
7. Operations on Employee table using JDBC
8. Bubble sort implementation using RMI
9. Constructing a simple database using XML
10. An interactive Web application in JSP
11. Using cookies to track users in browsers from the web servers
12. Constructing a secured FTP client – server application

Total : 45

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ELECTIVE – IV

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ELECTIVE – V

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L & T & P & C \\
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Electives should be chosen from the list of subject codes given below

CS530, CS650, CS655, CS667, CS669, CS689, CS691, CS693, CS695 & CS696

CS612 PROJECT WORK

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ELECTIVES FOR FIRST SEMESTER

MA553      DISCRETE MATHEMATICS      L    T    P    C
(Same as MA321)  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 I   MATHEMATICAL LOGIC       9

UNIT II    SET THEORY         9

UNIT III     RECURRENCE RELATION & ALGEBRAIC SYSTEMS 9
Groups – Cyclic groups and subgroups – Normal subgroups – Coding theory – Group codes.

UNIT IV    GRAPH THEORY         9

UNIT V     BOOLEAN ALGEBRA & FORMAL LANGUAGES  9

Total 45

TEXT BOOK
1. Alan Doerr and Kenneth Levasseur, “Applied Discrete Structures for Computer Science”, Galgotia Publications (P) Ltd.(Unit I – Chapter 3 Section 3.1 – 3.8, Unit II – Chapter 2, Chapter 4 Section 4.2 – 4.5, Chapter 6 Section 6.1, 6.2, 6.4, 6.5, Chapter 7, Unit III –
REFERENCE BOOKS

CS551 SYSTEM PROGRAMMING L T P C
(same as IT552) 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 – I INTRODUCTION AND ASSEMBLERS 9
Introduction: Language Processor Fundamentals, Data Structures Language Processing, Search data structures, Data Structures, Scanning, Parsing, Assemblers – Elements of assembly language programming, Simple assembly scheme, Pass structure of assemblers, Design of a two pass assembler, single pass assembler for IBM PC.

UNIT –II LOADERS AND LINKERS 9
Macro 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 – III COMPILERS – GRAMMERS AND FINITE AUTOMATA 9

UNIT- IV PARSING AND SYNTAX DIRECTED TRANSLATION 9
address code, Quadruples, Triples, Translation of assignment statement, Boolean expressions, Errors, Lexical phase errors, Semantic-phase errors, Semantic errors.

UNIT - V CODE OPTIMIZATION TECHNIQUES
Optimization Techniques: Principal Sources of Optimization, Loop Optimization, DAG Representation of Basic Blocks, Value Numbers and Algebraic laws, Global data-flow analysis, Dominators, Reducible flow graphs, Depth-first search, Loop-invariant computations, Induction variable Elimination, Other loop optimization.

Total: 45

TEXT BOOK

REFERENCE BOOK

CS553 GENETIC ALGORITHMS & MACHINE LEARNING L T P C
(Same as IT557) 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 - I INTRODUCTION TO GENETIC ALGORITHM

UNIT - II GA OPERATORS

UNIT - III APPLICATIONS OF GA

21
UNIT – IV INTRODUCTION TO GENETICS-BASED MACHINE LEARNING  7
Genetics – Based Machine learning – Classifier system – Rule & Message system –
Apportionment of credit: The bucket brigade – Genetic Algorithm – A simple classifier
system in Pascal. – Results using the simple classifier system.

UNIT – V 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
   Learning”, Pearson Education, 2001
   Algorithms“, PHI, 2003  (Chapters 8 and 9)

REFERENCE BOOK
   1995

CS623 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—I BASIC CONCEPTS 9
Software Components—Component models and Component Services—myths in Component
Based Technology—Risk Factors—Success Factors ,Component Based Software
Development.

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

UNIT—III DESIGN OF SOFTWARE COMPONENT 9
Software Components and the UML Component Infrastructures—Business Components—
Components and Connectors—Designing Models of Modularity & Integration.
UNIT—IV MANAGEMENT OF COMPONENT BASED SOFTWARE SYSTEMS  

UNIT—V COMPONENT TECHNOLOGIES  
Overview of the Following Component Models: CORBA, COM+, Enterprise Java Beans, Software Agents. 

Total : 45

TEXT BOOKS

REFERENCE BOOKS
CS651 NEURAL NETWORKS PROGRAMMING TECHNIQUES L T P C
3 0 0 3

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—I INTRODUCTION TO ANS TECHNOLOGY 9

UNIT—II BACK PROPAGATION 9
Back Propagation Network—The Generalized Delta Rule—Practical Considerations—Applications—The Back Propagation Simulator—BAM and Hopfield Memory—simulating the BAM.

UNIT—III SIMULATED ANNEALING 9

UNIT—IV SELF—ORGANIZING MAP 9
SOM Data Processing—Applications of Self—Organizing Maps—Simulating the SOM. Adaptive Resonance Theory: ART Network Description—ART1—ART2 - ART1 and ART2 Simulator.

UNIT—V SPATIOTEMPORAL PATTERN CLASSIFICATION 9

Total : 45

TEXT BOOK

REFERENCE BOOKS

CS685  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 I INTRODUCTION  9
Introduction - Multimedia applications – architecture and issues for distributed multimedia systems – multimedia skills – digital audio representations and processing – video technology.

UNIT II MULTIMEDIA HARDWARE AND SOFTWARE  9

UNIT III AUDIO, DIGITAL VIDEO AND IMAGE COMPRESSION  9

UNIT IV MULTIMEDIA BUILDING BLOCKS  9

UNIT V MULTIMEDIA INFORMATION SYSTEM  9
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
ELECTIVES FOR SECOND SEMESTER

CS560  
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-I   INTRODUCTION          9

UNIT -II   FUZZY RELATIONS AND MEMBERSHIP FUNCTIONS              9

UNIT -III   FUZZIFICATION AND FUZZY ARITHMETIC                              9

UNIT -IV   FUZZY LOGIC AND FUZZY RULE BASED SYSTEMS       9
Fuzzy logic –approximate reasoning-fuzzy tautologies-contradictions-equivalence-and logical proofs-other forms of implication operation and composition operation-linguistic hedges-rule based systems-fuzzy associative memories-multiobjective decision making –fuzzy bayesian decision method.

UNIT -V   APPLICATIONS                     9
Single sample identification-multifeature pattern recognition-image processing-simple fuzzy logic controllers-General fuzzy logic controllers-Industrial applications-Fuzzy tool box in Matlab.

Total 45

TEXT BOOK
Timothy J.Ross, ”Fuzzy Logic with Engineering applications”,McGraw Hill Inc.
REFERENCES BOOKS

CS562 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-I DIGITAL IMAGE FUNDAMENTALS
9

UNIT-II IMAGE ENHANCEMENT
9
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-III IMAGE RESTORATION
9

UNIT-IV IMAGE COMPRESSION
9

UNIT-V IMAGE SEGMENTATION AND REPRESENTATION
9
Point detection – Line detection – Edge detection – Boundary detection – Thresholding – Region-based segmentation; Representation – Boundary descriptors – Regional descriptors
Total : 45

TEXT BOOK

REFERENCE BOOKS
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 – I  INTRODUCTION

UNIT – II  GEOMETRIC MODELING

UNIT – III  VIRTUAL ENVIRONMENT

UNIT – IV VR HARDWARES & SOFTWARES

UNIT – V  VR APPLICATION

Total 45

TEXT BOOK
REFERENCE BOOKS

CS578 HUMAN INTERFACE SYSTEM DESIGN L T P C
(Common for CSE and S/W Engg.) 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 I INTRODUCTION 9
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 II MANAGING DESIGN PROCESS 9

UNIT III MANIPULATION AND VIRTUAL ENVIRONMENTS 9

UNIT IV INTERACTION DEVICES 9
UNIT V WINDOWS STRATEGIES AND INFORMATION SEARCH


Total : 45

TEXT BOOK

REFERENCE BOOKS
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 I INTRODUCTION 9

UNIT II SOFTWARE ENGINEERING PRINCIPLES 9

UNIT III SOFTWARE QUALITY ASSURANCE MODELS 9

UNIT IV SOFTWARE PROCESSES & TESTING 9
Software Process - Definition and implementation; internal Auditing and Assessments; Software testing - Concepts, Tools, Reviews, Inspections & Walkthroughs; P-CMM.

UNIT V TQM 9

Total 45

TEXT BOOKS

REFERENCE BOOKS
ELECTIVES FOR THIRD SEMESTER

CS530 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—I INTRODUCTION TO RELIABILITY ENGINEERING  9
Reliability — Repairable and Non Repairable systems — Maintainability and Availability — Designing for higher reliability — Redundancy — MTBF — MTTF MDT - MTTR— k out of in systems

UNIT—II SOFTWARE RELIABILITY  9

UNIT—III SOFTWARE RELIABILITY APPROACHES  9
Fault Avoidance — Passive Fault detection — Active Fault Detection — Fault Tolerance - Fault Recovery - Fault Treatment

UNIT—IV SOFTWARE RELIABILITY MODELING  9
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—V SPECIAL TOPICS IN SOFTWARE RELIABILITY  9

Total:45

TEXT BOOKS

REFERENCE BOOKS
CS650  PATTERN RECOGNITION TECHNIQUES  L  T  P  C  
3  0  0  3

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—I  PATTERN RECOGNITION OVERVIEW  7  
Pattern recognition, Classification and Description—Patterns and feature Extraction with Examples—Training and Learning in PR systems—Pattern recognition Approaches—Other Approaches to PR.

UNIT—II  STATISTICAL PATTERN RECOGNITION  11  
Introduction to statistical Pattern Recognition—supervised Learning using Parametric and Non Parametric Approaches.

UNIT—III  LINEAR DISCRIMINANT FUNCTIONS AND UNSUPERVISED LEARNING AND CLUSTERING  9  
Introduction—Discrete and binary Classification problems—Techniques to directly Obtain linear Classifiers — Formulation of Unsupervised Learning Problems—Clustering for unsupervised learning and classification.

UNIT—IV  SYNTACTIC PATTERN RECOGNITION  9  
Overview of Syntactic Pattern Recognition—Syntactic recognition via parsing and other grammars—Graphical Approaches to syntactic pattern recognition—Learning via grammatical inference.

UNIT—V  NEURAL PATTERN RECOGNITION  9  
Introduction to Neural networks—Feedforward Networks and training by Back Propagation—Content Addressable Memory Approaches and Unsupervised Learning in Neural PR.

Total:45

TEXT BOOK  

REFERENCE BOOKS  
5. C.M.Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995.

CS655                  DATA WAREHOUSING                  L  T  P  C
                                        3  0  0  3

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-I INTRODUCTION

UNIT-II DESIGN ASPECTS

UNIT-III 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-IV PLANNING AND DEVELOPMENT

UNIT-V 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.

Total :45

TEXT BOOK


REFERENCE BOOKS


CS656 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 – I INTRODUCTION AND LINGUISTIC BACKGROUND

Introduction to Natural Language Understanding – The Different levels of Language Analysis – Representation and Understanding – the Organization of Natural Language Understanding Systems.
Linguistic Background: The elements of Simple Sentences – Adjective Phrases and Adverbial Phrases.

UNIT – II PARSING

Features and Augmented Grammars: Some basic Feature systems for English - Parsing with features.
Efficient Parsing: Shift Reduce Parser – Deterministic Parser.

UNIT – III SEMANTICS

Semantic and Logical Form – Encoding Ambiguity in the logical form – Thematic Roles.
Semantic Interpretation and Compositionality – Lexicalized Semantic Interpretation and Semantic roles - semantic Interpretation Using Feature Unification.

UNIT – IV KNOWLEDGE REPRESENTATION

A Representation Based on FOPC – Handling Natural Language Quantification.

UNIT – V  DISCOURSE STRUCTURE AND CASE STUDIES  
Need – Segmentation and Cue Phrases – Tense and aspect – Managing the Attentional Stack – an Example.
Case Study : Logic and Model – Theoretic Semantics – A Semantics for FOPC – Symbolic Computation : Data structures – Matching , Search algorithms - The Unification Algorithm.

Text book

Reference books
2. Winograd, “ Language as a cognitive process- syntax”, Addison Wesley

CS667  REAL TIME SYSTEMS  L   T   P   C
(Common for CSE and S/W Engg.)  3   0   0   3

purposes
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 – I  Introduction  6

UNIT – II  Task Assignment and Scheduling  10

UNIT- III  Programming Languages and Tools  6

UNIT- IV  REAL TIME DATABASES  12

UNIT- V  Fault Tolerance, Reliability and Synchronization


Total: 45

TEXT BOOK


REFERENCES

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 – I CONVENTIONAL AND MODERN ENCRYPTION

UNIT – II PUBLIC KEY ENCRYPTION

UNIT – III AUTHENTICATION

UNIT – IV SECURITY PRACTICE

UNIT – V SYSTEM SECURITY

TEXT BOOK

REFERENCE BOOKS
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 I REVIEW OF EMBEDDED HARDWARE

UNIT II MICROCHIP PIC MICRO CONTROLLER

UNIT III EMBEDDED MICROCOMPUTER SYSTEM

UNIT IV SOFTWARE DEVELOPMENT

UNIT V REAL TIME OPERATING SYSTEM

TOTAL 45
TEXT BOOKS

REFERENCE BOOKS

CS691 FAULT TOLERANT SYSTEMS L T P C 3 0 0 3

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 - I INTRODUCTION 9

UNIT - II ERROR MODEL 9

UNIT - III FAULT TOLERANCE 9
Coding technique-fault tolerant self checking and fail safe circuits-fault tolerant in combinatorial and sequential circuits- synchronous and asynchronous fail safe circuits.

UNIT - IV ARCHITECTURE 9
Fault tolerant computers - general purpose commercial systems-fault tolerant multiprocessor and VLSI based communication architecture.

UNIT - V FAULT TOLERANT SOFTWARE 9
Design-N-version programming recovery block - acceptance tests-fault trees- validation of fault tolerant systems.
TEXT BOOKS

REFERENCE BOOKS

CS693 GRID COMPUTING L T P C

3 0 0 3

PURPOSE
This course provides a way to understand the emerging 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- I INTRODUCTION 9
Grid Computing values and risks – History of Grid computing – Grid computing model and protocols – overview of types of Grids

UNIT- II TYPES OF GRIDS 9
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 – III ARCHITECTURE AND MANAGEMENT 9

UNIT – IV NATIVE PROGRAMMING AND SOFTWARE APPLICATIONS 9
of the Grid users – methods of Grid deployment – Requirements for Grid enabling software – Grid enabling software applications

UNIT – V APPLICATIONS , SERVICES AND ENVIRONMENTS

TEXT BOOK

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

CS695 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-I 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-II 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-III 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-IV NEURO-FUZZY SYSTEMS

Introduction to Neuro - Fuzzy Systems - Fuzzy System Design Procedures – Fuzzy Sets and Logic Background - Fuzzy / ANN Design and Implementation

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

Total: 45

TEXT BOOKS

REFERENCE BOOKS