LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

(Approved by AICTE, Accredited by NBA, Affiliated to JNTUK, Kakinada and ISO 9001: 2008 Certified)

ACADEMIC REGULATIONS,
COURSE STRUCTURE
AND
DETAILED SYLLABUS

2010 - 2011

M.TECH – SOFTWARE ENGINEERING

DEPARTMENT OF INFORMATION TECHNOLOGY

L.B.Reddy Nagar, MYLAVARAM – 521 230
Krishna District, Andhra Pradesh State
# M.TECH(IT – SOFTWARE ENGINEERING) - COURSE STRUCTURE

(Applicable for the batches admitted from 2010-11)

## I-SEMESTER

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the Course</th>
<th>Scheme of Instruction</th>
<th>Scheme of Examination</th>
<th>Total</th>
<th>credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIT101</td>
<td>Requirements Engg. &amp; Estimation</td>
<td>4 Lecture 1 Tutorial</td>
<td>40 Internal 60 External</td>
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<tr>
<td>MIT102</td>
<td>Software Architectures</td>
<td>4 Lecture 1 Tutorial</td>
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<td>MIT103</td>
<td>Software Process Management</td>
<td>4 Lecture 1 Tutorial</td>
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<td>MIT104</td>
<td>Web Searching and Mining</td>
<td>4 Lecture 1 Tutorial</td>
<td>40 Internal 60 External</td>
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### ELECTIVE - I

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the Course</th>
<th>Scheme of Instruction</th>
<th>Scheme of Examination</th>
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<th>credits</th>
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<tbody>
<tr>
<td>MIT1051</td>
<td>Artificial Intelligence</td>
<td>4 Lecture 1 Tutorial</td>
<td>40 Internal 60 External</td>
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<tr>
<td>MIT1052</td>
<td>Mobile computing</td>
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<tr>
<td>MIT1053</td>
<td>Advanced Multimedia</td>
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<tr>
<td>MIT1054</td>
<td>Object Oriented Databases</td>
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### ELECTIVE - II

<table>
<thead>
<tr>
<th>Code No.</th>
<th>Name of the Course</th>
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<td>Service Oriented Architecture</td>
<td>4 Lecture 1 Tutorial</td>
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<tr>
<td>MIT1062</td>
<td>Enterprise resource planning</td>
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<tr>
<td>MIT1063</td>
<td>Digital Image Processing</td>
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<tr>
<td>MIT1064</td>
<td>Natural Language processing</td>
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<td>MIT151</td>
<td>Requirements Engg. &amp; Estimation Lab</td>
<td>3 Lecture 2 Tutorial</td>
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<tr>
<td>MIT152</td>
<td>Web searching and Mining lab</td>
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<td>MIT153</td>
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<td>3 Lecture 2 Tutorial</td>
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**TOTAL** 33 Lecture 6 Tutorial 370 Internal 480 External 850 30
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<td>LectureS</td>
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<td>MIT201</td>
<td>Software Metrics</td>
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<td>MIT202</td>
<td>Distributed Database Systems</td>
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<td>MIT203</td>
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<td>MIT204</td>
<td>Software Testing and Quality Assurance</td>
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<td>MIT2051</td>
<td>Data and Knowledge Management</td>
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<td>MIT2052</td>
<td>Embedded Systems</td>
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<td>MIT2053</td>
<td>Software Documentation</td>
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<td>MIT2061</td>
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<td>MIT2062</td>
<td>Object Oriented Software Engineering</td>
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<td>MIT2063</td>
<td>Human Computer Interfacing</td>
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<td>MIT253</td>
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### III SEMESTER

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<th>Code No.</th>
<th>Name of the Course</th>
<th>Scheme of Instruction</th>
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<td>MIT351</td>
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### IV SEMESTER

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<th>Code No.</th>
<th>Name of the Course</th>
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**TOTAL CREDITS : 88**

I Semester : 30
II Semester : 30
III Semester : 08
IV Semester : 20
I SEMESTER
MIT101: REQUIREMENTS ENGG. & ESTIMATION

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1               External Marks : 60
Credits  : 4               External Examination : 3 Hrs

UNIT - I

Introduction to Requirements Engineering
Software Requirements Definition – Levels of Requirements – Requirement Engineering -
Requirements Development and Management – When Bad Requirements happen to Nice
People - Benefits from a High quality requirements process – Characteristics of Excellent
Requirements – Functional and Nonfunctional Requirements – Good Practices for
Requirements Engineering - Practical process Improvement - Process Maturity –
Requirement Engineering process maturity

UNIT - II

Requirements Elicitation, Analysis and Documentation
Requirements Elicitation Guidelines – Requirements Elicitation Techniques – Requirement
Analysis – Requirement Analysis Models – Requirement Analysis and Negotiation –
Requirements Documentation – Characteristics of Software Requirements Specification
Document – Contents of SRS – Common Problems with SRS

UNIT - III

Requirements Validation and Management
Validation objectives – Review the Requirements – The Inspection Process – Requirements
Requirement Validation Guidelines Requirements Management – Requirement Traceability
– Database to Manage Requirements – Change Management Policies – Requirements
Engineering for Critical Systems - Software Requirements and Risk Management

UNIT - IV

Software Size Estimation
Software Estimation – Size Estimation – Two views of Sizing – Function Point Analysis –
Mark II FPA – Full Function Points - LOC Estimation – Conversion between Size Measures

UNIT - V

Effort – Schedule, Cost Estimation & Tools
What is Productivity? – Estimation Factors – Approaches for Effort and Schedule Estimation
– COCOMOII – Putnam Estimation Model – Algorithmic Models – Cost Estimation Tools:
Desirable Features of Requirements Management Tools – Some Requirements
Management Tools Available – Rational pro - Desirable Features in Software Estimation
Tools – Some Software Estimation Tools Available
TEXT BOOKS

2. Software Requirements and Estimation, Rajesh Naik, Swapna Kishore, TMH

REFERENCES

MIT102: SOFTWARE ARCHITECTURES

<table>
<thead>
<tr>
<th></th>
<th>Lecture</th>
<th>4 Periods/week</th>
<th>Internal Marks</th>
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<td>Tutorial</td>
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<td></td>
<td>Credits</td>
<td>4</td>
<td>External Examination</td>
<td>3 Hrs</td>
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UNIT - I

Software Architecture
Introduction-Architectural Styles, Pipes and Filters, Data Abstraction and Object Oriented Organization, Event based, Implicit Invocation, Layered Systems, Repositories, Interpreters, Process Control, Process control Paradigms, Software Paradigm for Process Control, Distributed processes, Main program / subroutine organizations, Domain, specific software architecture, heterogeneous architectures

UNIT – II

Shared Information Systems

UNIT - III

Architectural Design
Guidelines for Architectural design, Design space and rules, Applying design space with an example, study of Quantified design space, Architectural formalism and its applications, Formalizing Architectural design Space.

UNIT - IV

Architectural Description Languages
Requirements of an Architectural Description Language, First-Class Connectors, Adding implicit invocation to traditional programming Languages

UNIT – V

Architectural Design Tools
UniCon – A Universal Connecting Language, Exploiting styles in Architectural design, Architectural interconnection

TEXT BOOKS

MIT103: SOFTWARE PROCESS MANAGEMENT

Lecture: 4 Periods/week Internal Marks: 40
Tutorial: 1 External Marks: 60
Credits: 4 External Examination: 3 Hrs

UNIT – I
A Software maturity framework
Software Improvement, process maturity level, people in the optimizing level, need for the optimizing process.

UNIT - II
The Repeatable Process
Managing software organizations: commitment discipline, the management system, establishing a project management system.
The Project plan: project planning principles, contents, size measures, estimating, productivity factors, scheduling, project tracking, the developing plan, planning models, final considerations.
Software configuration management: Need for configuration management, software product nomenclature, basic configuration management function, baselines, configuration management responsibilities, need for automated tools, software quality management.

UNIT – III
Defined process
Software standards: definitions, reasons, benefits, examples of major standards, establishing software standard, standards versus guidelines.
Software inspections: Types of reviews, objectives, basic inspection principles, the conduct of inspections, inspection training, reports and tracking, other considerations, initiating and inspection program, future directions.
Software configuration management: the Software configuration management plan, Software configuration management questioners, scm support functions, the requirement phase, design control, the implementation phase, operational data, the test phase, scm for tools, configuration accounting, the software configurations audit.

UNIT- IV
Managed Process
Data gathering and analysis: the principles of data gathering, data gathering process, software measures, data analysis, other considerations.
Managing software quality: The quality management paradigm, quality motivation, quality goals, quality plans, tracking and controlling software quality.

UNIT-V
The Optimizing Process
Defect Prevention: Defect prevention not a idea, the principles of SDP, process changes for Defect prevention, defect prevention consideration, management role.
Automating the software process: The need for software automation, What to automate?, Development environments, organizational plans to automate, technology transitions, productivity.
TEXT BOOKS

1. Managing the software process by Watts S. Humphrey, published by Pearson Education.

REFERENCES

2. Software project management reading and cases by Chris Kemerer
UNIT - I


HYPERLINK-BASED RANKING: Introduction, Social Networks Analysis, PageRank, Authorities and Hubs, Link-Based Similarity Search, Enhanced Techniques for Page Ranking

UNIT - II

WEB CONTENT MINING CLUSTERING: Introduction, Hierarchical Agglomerative Clustering, k-Means Clustering, Probability-Based Clustering Finite Mixture Problem, Classification Problem, Clustering Problem, Collaborative Filtering (Recommender Systems)

EVALUATING CLUSTERING: Approaches to Evaluating Clustering, Similarity-Based Criterion Functions, Probabilistic Criterion Functions, MDL-Based Model and Feature Evaluation, Minimum Description Length Principle MDL-Based Model Evaluation, Feature Selection, Classes-to-Clusters Evaluation, Precision, Recall, and F-Measure Entropy

UNIT - III

CLASSIFICATION: General Setting and Evaluation Techniques, Nearest-Neighbor Algorithm, Feature Selection, Naive Bayes Algorithm, Numerical Approaches, Relational Learning

UNIT - IV

WEB USAGE MINING
INTRODUCTION TO WEB USAGE MINING: Definition of Web Usage Mining, Cross-Industry Standard Process for Data Mining, Click stream Analysis, Web Server Log Files, Remote Host Field, Date/Time Field, HTTP Request Field Status Code Field, Transfer Volume (Bytes) Field, Common Log Format, Identification Field, Authuser Field, Extended Common Log Format, Referrer Field, User Agent Field, Example of a Web Log Record, Microsoft IIS Log Format Auxiliary Information

PREPROCESSING FOR WEB USAGE MINING: Need for Preprocessing the Data, Data Cleaning and Filtering, Page Extension Exploration and Filtering, De-Spidering the Web Log File, User Identification, Session Identification Path Completion, Directories and the Basket Transformation, Further Data Preprocessing Steps,
UNIT - V

EXPLORATORY DATA ANALYSIS FOR WEB USAGE MINING: Introduction, Number of Visit Actions, Session Duration, Relationship between Visit Actions and Session Duration, Average Time per Page, Duration for Individual Pages

MODELING FOR WEB USAGE MINING: CLUSTERING, ASSOCIATION, AND CLASSIFICATION: Introduction, Modeling Methodology, Definition of Clustering, The BIRCH Clustering Algorithm, Affinity Analysis and the A Priori Algorithm

TEXT BOOK

Data Mining the Web: Uncovering Patterns in Web Content, Structure, and Usage, Publisher: Wiley-Interscience

HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
MYLAVARAM, Krishna (Dist) - 521 230.
MIT1051: ARTIFICIAL INTELLIGENCE

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1  External Marks : 60
Credits : 4  External Examination : 3 Hrs

UNIT - I

Introduction: Overview of Artificial intelligence- Problems of AI, AI technique, Tic - Tac - Toe problem.

Intelligent Agents: Agents & environment, nature of environment, structure of agents, goal based agents, utility based agents, learning agents.

Problem Solving: Problems, Problem Space & search: Defining the problem as state space search, production system, problem characteristics, and issues in the design of search programs.

UNIT - II

Search techniques: Solving problems by searching: problem solving agents, searching for solutions; uniform search strategies: breadth first search, depth first search, depth limited search, bi-directional search, comparing uniform search strategies.

Heuristic search strategies: Greedy best-first search, A* search, memory bounded heuristic search, local search algorithms & optimization problems, Hill climbing search, simulated annealing search, local beam search, genetic algorithms, constraint satisfaction problems, local search for constraint satisfaction problems.

UNIT - III

Knowledge: Knowledge representation issues, representation & mapping, approaches to knowledge representation, issues in knowledge representation.

Using predicate logic: Representing simple fact in logic, representing instant & ISA relationship, computable functions & predicates, resolution, natural deduction.

UNIT - IV

Representing knowledge using rules: Procedural verses declarative knowledge, logic programming, forward verses backward reasoning, matching, control knowledge.

UNIT - V

Reasoning: Probabilistic reasoning: Representing knowledge in an uncertain domain, the semantics of Bayesian networks, Dempster-Shafer theory, Fuzzy sets & fuzzy logics.
TEXT BOOK

1. Artificial Intelligence, Ritch & Knight, TMH

REFERENCES

1. Artificial Intelligence A Modem Approach, Stuart Russell & Peter Norvig Pearson
2. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI
5. Artificial Intelligence, Winston, Pearson Ed.
MIT1052: MOBILE COMPUTING

Lecture : 4 Periods/week
Tutorial : 1
Credits : 4

Internal Marks : 40
External Marks : 60
External Examination : 3 Hrs

UNIT - I

Wireless Transmission Fundamentals: Introduction to wireless transmission, signal propagation, Multiplexing, Modulation, Spread Spectrum

UNIT - II

GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services. (Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - III

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunneling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer: Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT - IV

Wireless LAN Technology-IEEE 802.11 (System Architecture, protocol architecture, physical layer, medium access control layer, mac management, 802.11b, 802.11a)
Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

UNIT - V

TEXT BOOK

Jochen Schiller, "Mobile Communications", Addison-Wesley.

REFERENCE BOOK

1. Williams Stallings, "Wireless Communication and Networks", Pearson Education.
MIT1053: ADVANCED MULTIMEDIA

Lecture : 4 Periods/week  \hspace{1cm} Internal Marks : 40
Tutorial : 1 \hspace{1cm} External Marks : 60
Credits : 4 \hspace{1cm} External Examination : 3 Hrs

UNIT - I


UNIT - II

Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class

UNIT - III


UNIT - IV

Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT - V

TEXT BOOKS

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education
2. Essentials ActionScript 2.0, Colin Moock, SPD O, REILLY.

REFERENCES

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
5. Multimedia Basics by Weixel Thomson
6. Multimedia Technology and Applications, David Hilman, Galgotia
MIT1054: OBJECT ORIENTED DATABASES

Lecture: 4 Periods/week  
Internal Marks: 40

Tutorial: 1  
External Marks: 60

Credits: 4  
External Examination: 3 Hrs

UNIT - I

Introduction to Object DBMSs: Advanced Databases Applications, Weaknesses of RDBMSs, Object-Oriented Concepts, Abstraction, Encapsulation, and Information, Objects and Attributes, Object Identity, Method and Messages, Classes, Subclasses, Superclasses, Inheritance, Overriding and Overloading, Polymorphism and Dynamic Binding, Complex Objects, Storing Objects in a relational Database, Mapping Classes to Relations, Accessing Objects in the Relational Database, Next Generation Databases Systems

UNIT - II

Object-Oriented DBMSs – Concepts and Design: Introduction to Object-Oriented Data Models and DBMS Models and DBMS, Persistent, programming Languages ii) Alternative strategies for Developing an OODBMS, OODBMS Perspectives: Pointers Sizzling Techniques, Accessing an object, Persistence, Persistence Schemes, Orthogonal Persistence, Issues in OODBMSs, Transactions, Schema Evolution, Architecture, Benchmarking, Advantages and Disadvantages of OODBMSs, Advantages Disadvantages, Object-Oriented Databases Design, Comparison between Object-Oriented Data Modeling and Conceptual Data Modeling, Relationship and Referential Integrity

UNIT - III


UNIT - IV


UNIT - V

Disadvantages of CGI, HTTP Cookies, Extending the Web Server, Netscape API, Comparison of CGI and API

TEXTBOOK

Databases systems by CONNOLLY and BEGG Pearson education third edition
MIT1061: SERVICE ORIENTED ARCHITECTURE

Lecture : 4 Periods/week
Internal Marks : 40
Tutorial : 1
External Marks : 60
Credits : 4
External Examination : 3 Hrs

UNIT - I

SOA Fundamentals: Defining SOA, Business Value of SOA, Evolution of SOA, SOA characteristics, concept of a service in SOA, misperceptions about SOA, Basic SOA architecture, infrastructure services, Enterprise Service Bus (ESB), SOA Enterprise Software models, IBM On Demand operating environment

UNIT - II

SOA Planning and Analysis: Stages of the SOA lifecycle, SOA Delivery Strategies, service-oriented analysis, Capture and assess business and IT issues and drivers, determining non-functional requirements (e.g., technical constraints, business constraints, runtime qualities, non-runtime qualities), business centric SOA and its benefits, Service modeling, Basic modeling building blocks, service models for legacy application integration and enterprise integration, Enterprise solution assets (ESA)

UNIT - III

SOA Design and implementation: Service-oriented design process, design activities, determine services and tasks based on business process model, choosing appropriate standards, articulate architecture,

UNIT - IV

mapping business processes to technology, designing service integration environment (e.g., ESB, registry), Tools available for appropriate designing, implementing SOA, security implementation, implementation of integration patterns, services enablement, quality assurance

UNIT - V

Managing SOA Environment: Distributing service management and monitoring concepts, operational management challenges, Service-level agreement considerations, SOA governance (SLA, roles and responsibilities, policies, critical success factors, and metrics), QoS compliance in SOA governance, role of ESB in SOA governance, impact of changes to services in the SOA lifecycle
TEXT BOOKS


REFERENCES

2. Dave Chappell, "Enterprise Service Bus", O'Reilly Publications, 2004
MIT1062: ENTERPRISE RESOURCE PLANNING

Lecture : 4 Periods/week  
Tutorial : 1  
Credits : 4  
Internal Marks : 40  
External Marks : 60  
External Examination : 3 Hrs

UNIT- I


UNIT- II


UNIT- III


UNIT- IV


UNIT- V

ERP – PRESENT AND FUTURE: Turbo Charge the ERP System – EIA – ERP and E-Commerce – ERP and Internet – Future Directories in ERP.

TEXT BOOKS


REFERENCES

MIT1063: DIGITAL IMAGE PROCESSING

Lecture: 4 Periods/week  
Internal Marks: 40
Tutorial: 1  
External Marks: 60
Credits: 4  
External Examination: 3 Hrs

UNIT – I

Introduction: Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels

UNIT – II

Image enhancement in the spatial domain: Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods (p.nos 76-141).
Image restoration: A model of the image degradation/restoration process, noise models, restoration in the presence of noise—only spatial filtering, Weiner filtering, constrained least squares filtering,

UNIT – III

Color Image Processing: Color fundamentals, color models, pseudo color image processing, basics of full-color image processing, color transforms, smoothing and sharpening, color segmentation
Image Compression: Fundamentals, image compression models, error-free compression, loss predictive coding

UNIT – IV

Morphological Image Processing: Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms
Image Segmentation: Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation

UNIT – V

Object Recognition: Patterns and patterns classes, recognition based on decision-theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching
TEXT BOOK


REFERENCES

2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
MIT 1064: NATURAL LANGUAGE PROCESSING

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1  External Marks : 60
Credits : 4  External Examination : 3 Hrs

UNIT-I

Introduction: NLP tasks in syntax, semantics, and pragmatics. Applications such as information extraction, question answering, and machine translation. The problem of ambiguity. The role of machine learning. Brief history of the field.

UNIT-II


UNIT-III

Syntactic parsing: Grammar formalisms and tree banks. Efficient parsing for context-free grammars (CFGs). Statistical parsing and probabilistic CFGs (PCFGs). Lexicalized PCFGs.

UNIT-IV


UNIT-V

Information Extraction (IE) and Machine Translation (MT): Named entity recognition and relation extraction. IE using sequence labeling. Basic issues in MT. Statistical translation, word alignment, phrase-based translation, and synchronous grammars. Dialogues: Tums and utterances, grounding, dialogue acts and structures

Natural Language Generation: Introduction to language generation, architecture, discourse planning (text schemata, rhetorical relations).

TEXT BOOK


REFERENCES

MIT151: REQUIREMENTS ENGG. & ESTIMATION LAB

<table>
<thead>
<tr>
<th>Lecture</th>
<th>3 Periods/week</th>
<th>Internal Marks</th>
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<td>Credits</td>
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<td>External Examination</td>
<td>3 Hrs</td>
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Aim: The students should go through full SDLC traceability for features, requirements.

OBJECTIVES:
The students are expected to refine and validate software requirements through the performance of the following:

- Identify customer’s needs.
- Evaluate system for feasibility.
- Perform economic and technical analysis.
- Allocate functions to system elements.
- Establish schedule, constraints and estimate cost.
- Create system definitions

1. Study various tools such as OSRMT, Borland Caliber Analyst, IBM Telelogic DOORS, Rational Rose Suite etc.

2. Do experiments that cover following Requirements Lifecycle Management practices, and techniques of the whole requirements process and also estimate the cost
   a. Requirements elicitation (requirements capture)
   b. Requirements definition
   c. Requirements validation
   d. Requirements analysis
   e. Requirements modeling
   f. Requirements management
   g. Requirements traceability

3. Mini projects on any relevant current topics. Suggested topics:
   a. IT Infrastructure Management Application
   b. Reservation Systems for Air lines, Railways etc.
   c. Knowledge Management System
   d. Remote Procedure Call Implementation
   e. Inventory Management System

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Lakireddy Bali Reddy College of Engineering
Mylavaram, Krishna (Dist) - 521 230.
MIT152: WEB SEARCHING AND MINING LAB

Lecture : 3 Periods/week  
Internal Marks : 40  
Tutorial :  
External Marks : 60  
Credits : 2  
External Examination : 3 Hrs

1. Extraction of data from various sources
   a) Variable
   b) User input file
   c) MS-Access database
   d) Oracle databases

2. Different field and record options that facilitated to manipulate the data

3. Different visualization measures that include different graphs of data

4. Examples to describe web, multi and plot graphs

5. Association rules in Clementine by using apriori algorithm

6. Association rules in Clementine by using GRI algorithm

7. K-Means algorithms

8. Kohenen algorithm

9. Decision tree using C5 algorithm

10. CRT algorithm

K, 1995, IEEE Press (NY), USA
II SEMESTER
MIT201: SOFTWARE METRICS

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1  External Marks : 60
Credits : 4  External Examination : 3 Hrs

UNIT-I


UNIT-II


UNIT-III

Applying the Seven Basic Quality Tools in Software Development: Ishikawa’s Seven Basic Tools, Checklist, Pareto Diagram, Histogram, Run Charts, Scatter Diagram, Control Chart, Cause-and-Effect Diagram, Relations Diagram.

Defect Removal Effectiveness: A closer look at Defect Removal Effectiveness, Defect Removal Effectiveness and Quality Planning, Cost Effectiveness of Phase Defect Removal

UNIT-IV


Complexity Metrics and Models: Lines of Code, Halstead’s Software Science, Cyclomatic Complexity, Syntactic Constructs, Structure Metrics, An Example of Module Design Metrics in Practice

UNIT-V

Metrics and Lessons learned for Object-oriented projects: Object - oriented Concepts and Constructs, Design and Complexity metrics, productivity metrics, Quality and quality management metrics, Lessons learned for OO projects.

TEXT BOOKS


REFERENCES

UNIT-I

Distributed databases features - distributed database management systems - review of databases and computer networks, levels of distribution transparency. Reference architecture, type of data fragmentation, distribution transparency for read only applications and update applications. Distributed database access primitives and integrity constraints.

UNIT-II

Distributed database design, a frame work for distributed database design, the design of database fragmentation, the allocation of fragments. Translation global queries to fragment queries, equivalents transformation for queries. Transforming global Queries into fragment queries. Distributed grouping and aggregate function evaluation, parametric queries

UNIT-III

Query optimization, problems in query Optimization. objectives in query process optimization. simpler representation of queries, model for query optimization, join query, general queries. Distributed Database administration: Catalog management in Distributed databases, Authorization and protection.

UNIT-IV

The Management of Distributed Transactions : A frame for Transaction Management, Supporting Atomicity of Distributed Transaction, Concurrency Control Based on Timestamps, Architectural Aspects of Distributed Transactions

UNIT-V

Concurrency Control : Foundations of Distributed Concurrency Control, Distributed Deadlocks Concurrency Control Based on Timestamps, Optimistic Methods for Distributed Concurrency Control

TEXT BOOK

Distributed Databases by Ceri and Pelgatti Tata McGrawhill
UNIT – I

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs Conventional Encryption Principles, Conventional encryption algorithms (DES, Triple DES, AES), cipher block modes of operation (CBC, CFB), location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT – II

Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management, Kerberos, X.509 Directory Authentication Service.

UNIT – III


UNIT – IV

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET). Intruders,

UNIT – V


TEXT BOOK


REFERENCES

3. Network Security; The complete reference, Robert Bragg, Mark Rhodes, TMH
4. Introduction to Cryptography, Buchmann, Springer.
# MIT204: SOFTWARE TESTING & QUALITY ASSURANCE

<table>
<thead>
<tr>
<th>Component</th>
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<tr>
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## UNIT – I

The software quality challenge, what is software quality, software quality factors, the components of the software quality assurance system – overview: an SQA architecture, Pre-project components, Software project life cycle components, Infrastructure components for error prevention and improvement, Management SQA components, SQA standards, system certification, and assessment components, Organizing for SQA – the human components, Considerations guiding construction of an organization’s SQA system.

## UNIT – II

**Contract review:** The contract review process and its stages, Contract review objectives, Implementation of a contract review, Contract review subjects, Contract reviews for internal projects, Development and quality plans, Reviews, objectives, formal design reviews, peer reviews, a comparison of team review methods, expert opinions.

## UNIT – III

**Basics of software testing:** humans, errors and testing, Requirements, behavior and correctness. Correctness versus reliability, testing and debugging, test metrics, testing and verification, static testing, types of testing.

## UNIT – IV

**Test generation from requirements:** introduction, the test selection problem, equivalence partitioning, boundary value analysis and category partition method, **Test generation from finite state models:** SW design and testing, finite state model, conformance testing, fault model, characterization test, W method and Wp method.

## UNIT – V

**Test generation from combinatorial designs:** combinatorial designs, a combinatorial test design process, fault model, Regression testing: what is RT? , RT process, RTS the problem, selecting RT, test selection using execution trace, TS using dynamic slice, scalability of TS algorithms, test minimization, test prioritization, tools for RT.

## TEXT BOOKS

1. Software quality assurance-from theory to implementation, Daniel Galin, Pearson, 2009. (U1)
2. Foundations of software Testing, Aditya Mathur, Pearson, 2008 (U2, U3, U4)
REFERENCES

1. Software Quality, Mordechei Ben - Menachem /Garry S. Marlis , Thomson
3. Software Quality Theory and Management, 2/e, Alan C Gillies, Cenagage Learning, 2003(U6,U8)
MIT2051: DATA AND KNOWLEDGE MANAGEMENT

Lecture : 4 Periods/week     Internal Marks : 40
Tutorial : 1                   External Marks : 60
Credits : 4                   External Examination : 3 Hrs

UNIT - I

Data Security: Database systems- architectures- storage structures- storage issues in in Database Management Systems- Security of data at various levels of Database Management Systems

UNIT - II

Distributed Databases: Distributed Data Processing- Distributed Database system-
Distributed Database Management System Architecture: Architectural models for Distributed Database Management System – Global directory issues – Distributed database design – distributed design issues – fragmentation – Allocation

UNIT III

Semantic Data Control: View Management – Data centralized Authorization control –
Distributed Authorization control – centralized Semantic Integrity Control - Centralized Semantic Integrity Control - Database interoperability - issues related to security in database interoperability

UNIT - IV

Knowledge base systems - Knowledge base system design – storage of knowledge –
various formats – Levels of security issues in Knowledge base system design – conceptual level – implementation level

UNIT - V

Expert Systems – Design of Expert systems – Knowledge representation techniques in
Expert system – structured, semi structured and unstructured data – Knowledge Management and security issues.

TEXT BOOKS


REFERENCES

MIT2052: EMBEDDED SYSTEMS

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1  External Marks : 60
Credits : 4  External Examination : 3 Hrs

UNIT – I

Introduction to Embedded Systems, concepts, examples of embedded systems ,The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (Chapter 3 from Text Book 2, Ayala)

UNIT – II


UNIT – III


UNIT – IV

Introduction to Real – Time Operating Systems : Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (Chapter 6 and 7 from Text Book 1, Simon).

UNIT – V


TEXT BOOKS

1. An Embedded Software Primer, David E. Simon, Pearson Education.

REFERENCES

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
5. Microcontrollers, Raj kamal, Pearson Education.
MIT2053: SOFTWARE DOCUMENTATION

Lecture : 4 Periods/week  Internal Marks : 40
Tutorial : 1                     External Marks : 60
Credits : 4                     External Examination : 3 Hrs

UNIT - I
Introductions; course overview; technology survey, Task Oriented Documentation, Understanding Task Orientation Writing for Software Users Analyzing Your Users, Software Research, Writing to Teach, Collaborative Planning (Chapters 1, 2, 5)

UNIT - II
Planning & Writing Your Documents, Collaborative Documentation Design Collaborative Tutorial Drafting, Getting Useful Reviews (Chapters 6, 7)

UNIT - III
Editing & Fine Tuning, Working with Clients & Users Final Project Selection, Designing for Task Orientation, Final Project Proposals, Work on Manual & Usability Testing Plans (Chapters 9, 10)

UNIT - IV
Final Project Design Plan, Laying Out Pages & Screens, Using Graphics Effectively, Final Project Drafting, Getting the Language Right (Chapters 11, 12, 13)

UNIT - V
Final Usability Testing, Designing Indexes, Conducting Usability Tests, Reporting Usability Testing, Final Project Prototype due, Final Project Presentations, Presentations of Software Manuals (Chapters 8, 14, 15)

TEXT BOOK

REFERENCES
UNIT - I

Processes

THREADS: Introduction to threads, Threads in distributed systems; CLIENTS: User interfaces, Client-side software for distribution transparency SERVERS: General design issues, Object servers; CODE MIGRATION: Approaches to code migration, migration and Local resources, Migration in heterogeneous systems, example: D'agents

SOFTWARE AGENTS : Software agents in distributed systems, agent technology

UNIT- II

Naming Systems

NAMING ENTITIES : Names, Identifiers, and Addresses, name resolution, The implementation of a name space, Example: DNS, X.500

REMOVING UNREFERENCED ENTITIES : The problem of unreferenced objects, reference counting, Reference listing, Identifying unreachable entities

UNIT- III

Synchronization

Clock synchronization, Logical clocks, global state, Election algorithms, Mutual exclusion, Distributed transactions

Consistency and Replication : Introduction, Data centric consistency models, Client-centric consistency models, Distribution protocols, Consistency protocols.

UNIT- IV

Fault Tolerance

Introduction to fault tolerance, Process resilience, Reliable client-server communication, Reliable group communication, Distributed commit, Recovery

UNIT- V

Distributed Object Based Systems

CORBA, Distributed com, Globe and comparison of CORBA, DCOM, and Globe

Distributed File Systems: Sun network file system, Coda file system, Plan 9, XFS and SFS, Scalable security, Comparison of distributed file Systems

TEXT BOOK

1. Distributed Systems-principles and paradigms , 2/e, Andrew S. Tanenbaum, Marten vansteen , PHI , 2007

EXAMINATION SESSION

M.TECH (IT – SOFTWARE ENGINEERING), A.Y.2010-2011 Page 49
REFERENCES

MIT2061: INFORMATION STORAGE & MANAGEMENT

<table>
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<th>Lectures</th>
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UNIT-I

Introduction to Information Storage Technology, Review data creation and the amount of data being created and understand the value of data to a business; Challenges in Data Storage and Management, Data Storage Infrastructure. Storage Systems Environment, Components of a Storage System Environment: Disk drive components, Disk Drive Performance, Logical Components.

UNIT-II

Data protection, Concept of RAID and its Components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Comparison of Levels. Intelligent Storage Systems, Components, Intelligent Storage Array, High-level architecture and working of an intelligent storage system.

UNIT-III


UNIT-IV

Storage Virtualization, Forms, Taxonomy, Configuration, Challenges, Types of Storage Virtualizations, Information Availability & Monitoring & Managing Datacenter, Information Availability, Business continuity, Failure Analysis, Business Impact Analysis, Differentiate between business continuity (BC) and disaster recovery (DR).

UNIT-V

TEXT BOOK

1. EMC Educational Services, .Information Storage and Management., Wiley India.

REFERENCES

UNIT I

Introduction to Object Orientation

UNIT II

Object-Oriented Analysis
Object – Oriented Analysis: Introduction, Techniques for Information gathering for RA, Use case driven Object-Oriented analysis, concepts and principles. Identifying the elements of an Object model, Management of Object – Oriented software projects. Object oriented analysis, domain analysis, and generic components of Object- Oriented analysis model, object behavior model.

UNIT III

Object-Oriented System Design
Object-Oriented design introduction, System design concepts and the Object-Oriented Approach, Conventional versus Object – Oriented approaches, Design issues, the generic components of the Object – Oriented design model, the system design process, the object design process, Object – Oriented Design landscape, Useful design patterns, Object-Oriented design process, Design patterns. UML and the System Design: Introduction to the Unified Modeling Language (UML), the unified approach, Unified Modeling Language, Static class diagram, Use case diagram, Behavior diagram relationships, Identifying attributes and methods.

UNIT IV

Object Oriented Testing
Testing Object – Oriented Analysis and Object – Oriented Design models, Object-Oriented testing strategies, Test case design for Object – Oriented software; testing methods applicable at the class level, interclass test case design.

Technical metrics for Object – Oriented Systems:
The intent of Object- Oriented metrics, the distinguishing characteristics, and metrics for the Object-Oriented design model, class oriented metrics, operation oriented metrics, metrics for Object Oriented testing, metrics for Object -Oriented projects.
UNIT - V

Object-Oriented Programming Paradigm
Object-Oriented Support of software Qualities Data Abstraction and Encapsulation, Data
type and Abstract data type Object-Oriented Program Structure, more about inheritance
reusability and support for Reuse class design, guidelines morphism and polymorphism.
Binding, Overloading, Overriding Object-Life Cycle. Persistent Objects Introduction to
Object- Oriented Databases Object-Oriented Programming Environments, comparison
between C++, Java and C#.

TEXT BOOKS


REFERENCE BOOKS


HEAD
Department of Computer Science and Engineering
Lakireddy Bali Reddy College of Engineering
Mylavaram, Krishna (Dist) - 521 230.
MIT2063: HUMAN COMPUTER INTERFACING

UNIT-I

Introduction
Importance of user interface, definition, importance of good design, Benefits of good design,
A brief history on screen design.
Graphical User Interface: Popularity of Graphics, the concept of direct manipulation,
graphical system, characteristics, web user interface popularity, characteristics-principles of
user interface.

UNIT-II

Design process
Human interaction with computers, importance of human characteristics, human
considerations, human interaction speeds, understanding business junctions.

UNIT-III

Screen Designing & Window
Design goals, screen planning and purpose, organizing screen elements, ordering of screen
data and content, screen navigation and flow, visually pleasing composition, amount of
information, focus and emphasis, presentation information simply and meaningfully,
information retrieval on web, statistical graphics, technological consideration in interface
design Windows new and Navigation schemes selection of window, selection of devices
based on screen based controls.

UNIT-IV

Components and Software tools
Components: text and messages, icons and increases, multimedia, colors, user problems,
choosing colors.
Software tools: Specification methods interface, building tools.

UNIT-V

Interaction Devices
Keyboard and function keys, pointing devices, speech recognition digitization and
generation, image and video displays, drivers.

TEXT BOOKS

1. Human Computer Interaction, Alan Dix, Janet Fincky, Gre Goryd, Abowd, Russel
Beal, PEA.
2. The Essential guide to user interface design, Wilbert O Galitz, Wiley Dreama Tech.
UNIT – I


UNIT – II

Finger scan – Features – Components – Operation (Steps) – Competing finger Scan technologies – Strength and weakness. Types of algorithms used for interpretation. Facial Scan - Features – Components – Operation (Steps) – Competing facial Scan technologies – Strength and weakness.

UNIT – III

Iris Scan - Features – Components – Operation (Steps) – Competing iris Scan technologies – Strength and weakness .Voice Scan - Features – Components – Operation (Steps) – Competing voice Scan (facial) technologies – Strength and weakness.

UNIT – IV


UNIT – V


TEXT BOOKS


REFERENCES

MIT251 : INFORMATION SECURITY LAB.

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<td>11</td>
<td>Implementation of DES algorithm on 64 bit plain text</td>
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<td>12</td>
<td>Digital signature generation using Java</td>
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MIT252 : SOFTWARE TESTING LAB

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</table>

1. Study of various tools Study various tools such as WinRunner, LoadRunner, TestDirector, Rational Rose Suite etc.

2. Perform experiments to do the following:
   a. Requirements Testing
   b. Use – case Scenario Testing
   c. Unit Testing
   d. Regression Testing
   e. Integration Testing
   f. Validation Testing
   g. Acceptance Testing
   h. System Testing

3. Prepare test plan and develop test case hierarchy

4. Generate Test cases and Test Documentation in the following case studies
   a. Library System
   b. Course Registration System
   c. Implement a Quiz System
   d. Student Marks Analyzing System
   e. Online Ticket Reservation System
   f. Stock Management System

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