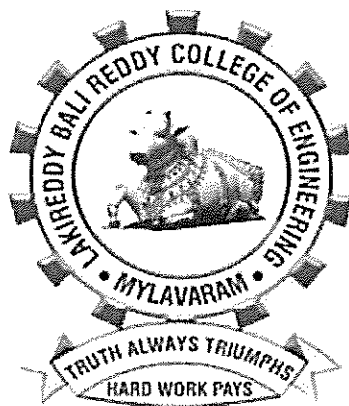


# LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

(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**

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination		Total	credits
		Periods per Week			Maximum Marks			
		Lecture	Tutorial	Lab.	Internal	External		
MIT101	Requirements Engg. & Estimation	4	1	--	40	60	100	4
MIT102	Software Architectures	4	1	--	40	60	100	4
MIT103	Software Process Management	4	1	--	40	60	100	4
MIT104	Web Searching and Mining	4	1	--	40	60	100	4
	<b><u>ELECTIVE- I</u></b>							
MIT1051	Artificial Intelligence	4	1	--	40	60	100	4
MIT1052	Mobile computing							
MIT1053	Advanced Multimedia							
MIT1054	Object Oriented Databases							
	<b><u>ELECTIVE- II</u></b>							
MIT1061	Service Oriented Architecture	4	1	--	40	60	100	4
MIT1062	Enterprise resource planning							
MIT1063	Digital Image Processing							
MIT1064	Natural Language processing							
MIT151	Requirements Engg. & Estimation Lab	3	--	--	40	60	100	2
MIT152	Web searching and Mining lab	3	--	--	40	60	100	2
MIT153	Mini Project	3	--	--	50	--	50	2
	<b>TOTAL</b>	<b>33</b>	<b>6</b>		<b>370</b>	<b>480</b>	<b>850</b>	<b>30</b>

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**II-SEMESTER**

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination		Total	credits
		Periods per Week			Maximum Marks			
		Lectures	Tutorial	Lab.	Internal	External		
MIT201	Software Metrics	4	1	--	40	60	100	4
MIT202	Distributed Database Systems	4	1	--	40	60	100	4
MIT203	Information Security	4	1	--	40	60	100	4
MIT204	Software Testing and Quality assurance	4	1	--	40	60	100	4
	<b><u>ELECTIVE-III</u></b>							
MIT2051	Data and Knowledge Management	4	1	--	40	60	100	4
MIT2052	Embedded Systems							
MIT2053	Software Documentation							
MIT2054	Distributed Operating Systems							
	<b><u>ELECTIVE-IV</u></b>							
MIT2061	Information Storage & Management	4	1	--	40	60	100	4
MIT2062	Object Oriented Software Engineering							
MIT2063	Human Computer Interfacing							
MIT2064	Biometrics							
MIT251	Information Security Lab	3	--	--	40	60	100	2
MIT252	Software Testing Lab	3	--	--	40	60	100	2
MIT253	Term Paper	3	--	--	50	--	50	2
	<b>TOTAL</b>	<b>33</b>	<b>6</b>	<b>--</b>	<b>370</b>	<b>480</b>	<b>850</b>	<b>30</b>



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**III SEMESTER**

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination		Total	credits
		Lectures	Tutorial	Lab	Internal	External		
MIT351	Technical Seminar	--	--	6	50		50	8

**IV SEMESTER**

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination		Total	credits
		Lectures	Tutorial	Lab	Internal	External		
MIT451	Dissertation	--	--	15	50	150	200	20

**TOTAL CREDITS : 88**

I Semester : 30	III Semester : 08
II Semester : 30	IV Semester : 20

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**I SEMESTER**

## MIT101: REQUIREMENTS ENGG. &amp; ESTIMATION

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

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**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 Review Challenges – Testing the Requirements – Defining Acceptance Criteria – 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



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**TEXT BOOKS**

1. Software Requirements, Karl E. Wiegers, Word Power Publishers, 2000
2. Software Requirements and Estimation, Rajesh Naik , Swapna Kishore, TMH

**REFERENCES**

1. Requirements Engineering: A Good practice Guide, Ian Sommerville, Pete Sawyer, Pearson, 2004
2. Managing Software Requirements A Use Case Approach, 2/e, Dean, Don , Addison-Wesley, 2003
3. Requirements Engineering and Rapid Development, Ian Graham, Addison-Wesley, 1998
4. Mastering the Requirements Process. 2/e, S.Robertson, J.Robertson, Pearson, 2006



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**MIT102: SOFTWARE ARCHITECTURES**

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

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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**

Data base integration, Batch sequential, Simple Repository, Virtual Repository, Hierarchical Layers, Evolution of Shared Information Systems in Business Data Processing, Integration in Software Development Environments, Integration in Design of Buildings, Architectural Structures for 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**

1. Mary Shaw & David Garlan, "Software Architecture", Prentice Hall India Private Limited.
2. Len Bass, Paul Clements, & Rick Kazman, "Software Architecture in Practice", Second Edition, Pearson Education.



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## MIT103: SOFTWARE PROCESS MANAGEMENT

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

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**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



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**TEXT BOOKS**

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

**REFERENCES**

1. Software Project Management , Walker Royce, published by Pearson Education.
2. Software project management reading and cases by Chris Kemerer



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**MIT104: WEB SEARCHING AND MINING**

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

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**UNIT - I**

**WEB STRUCTURE MINING INFORMATION RETRIEVAL AND WEB SEARCH** :Web Challenges -Web Search Engines ,Topic Directories ,Semantic Web, Crawling the Web - Web Basics, Web Crawlers ,Indexing and Keyword Search -Document Representation, Implementation Considerations, Relevance Ranking, Advanced Text Search, Using the HTML Structure in Keyword Search, Evaluating Search Quality -Similarity Search, Cosine Similarity Jaccard Similarity

**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,



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**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



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## MIT1051: ARTIFICIAL INTELLIGENCE

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

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**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.



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**TEXT BOOK**

1. Artificial Intelligence, Ritch & Knight, TMH

**REFERENCES**

1. Artificial Intelligence A Modern Approach, Stuart Russell & Peter Norvig Pearson
2. Introduction to Artificial Intelligence & Expert Systems, Patterson, PHI
3. Artificial Intelligence A new Synthesis, Neil J. Nilsson, Morgan Kaufman
4. Artificial Intelligence, John. F. Lugar, Pearson Ed.
5. Artificial Intelligence, Winston, Pearson Ed.



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## MIT1052: MOBILE COMPUTING

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

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**UNIT - I****Introduction to Mobile Communications and Computing : Mobile Computing (MC) :**

Introduction to MC, novel applications, limitations, and architecture.

**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**

**Bluetooth:** User scenarios, Architecture, Radio layer, Baseband layer, Link manager protocol, L2CAP, Security , SDP , profiles , IEEE 802.15 .

**Wireless Application Protocol :** Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless truncation protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML Script, Wireless telephony application, Push architecture, Push/pull services, Examples stacks with WAP 1.X.



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**TEXT BOOK**

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

**REFERENCE BOOK**

1. Williams Stallings, "Wireless Communication and Networks", Pearson Education.
2. Raj Pandya, " Mobile and Personal Communication Systems and Services", Prentice Hall of India, 2001.
3. Uwe Hansmann, Lothar Merk, Martin Nicklous, Thomas Stober, " Principles of Mobile Computing" , Springer International Edition, 2nd edition , 2003.



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## MIT1053: ADVANCED MULTIMEDIA

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

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**UNIT - I**

**Fundamental concepts in Text and Image:** Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video. Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

**UNIT - II**

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

**Action Script II:** Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions Application Development: An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

**UNIT - III**

**Multimedia data compression:** Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees(SPIHT).

**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**

**Multimedia Networks:** Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).



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**TEXT BOOKS**

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

**REFERENCES**

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.
3. Multimedia and communications Technology, Steve Heath, Elsevier(Focal Press)
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
5. Multimedia Basics by Weixel Thomson
6. Multimedia Technology and Applications, David Hilman, Galgotia



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## 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, Classes ,Subclasses ,Super classes and Inheritances, 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**

Object–oriented Databases Design: Object Management Group, Background, Common Object Request Broker Architecture, Object Databases Standard ODMG 3.0,1999, The object Data Management Group, The Object Model, The Object Definition language, The object Query Language, Other parts of the ODMG Standards, Object Store, Architecture, Data Definition in Object Store, Data manipulation in Object Store.

**UNIT- IV**

**Object –Relational DBMSs** : Introduction to Object-Relation Database Systems, The Third – Generation Databases Manifestos, The Third –Generation Databases System Manifesto, The Third Manifesto Postgres – An early ORDBMS, Objectives of Postgres, Abstract Data Types, Relation and Inheritance, Object Identity. SQL3 - Row Types, User –Defined Types, User – Defined Routines Polymorphism, References Types and Object Identity, Subtypes and Super types, Creating tables Querying data, Collection Types Persistent Stored Modules, Triggers, large Objects, Recursion, SQL3 and OQL

**UNIT- V**

Web Technology and DBMSs: Introduction to the Internet and Web, Internets and Extranets, e-Commerce and Business, The web Hyper Text Transfer Protocol, Hypertext markup language, Uniform Resource Locator, Static and Dynamic Web Pages, The Web as a Database Application Platform Requirements for web-DBMS Integration, Web-DBMS Architecture, Advantages and Disadvantages of the Web –DBMS Approach, Approaches to Integrating the Web and DBMS, Scripting Languages JavaScript and Jscript, VBScript, Perl and PHP, Common Gateway Interface, Passing Information to a CGI Script, Advantages and



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



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**MIT1061: SERVICE ORIENTED ARCHITECTURE**

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

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**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 onstraints, 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



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### TEXT BOOKS

1. Thomas Erl, "Service-Oriented Architecture: Concepts, Technology, and Design", Prentice Hall Publication, 2005.
2. Norbert Bieberstein, Sanjay Bose, Marc Fiammante, Keith Jones, Rawn Shah, "Service-Oriented Architecture Compass: Business Value, Planning, and Enterprise Roadmap", IBM Press Publication, 2005.

### REFERENCES

1. Thomas Erl, "Service-Oriented Architecture: A Field Guide to Integrating XML and Web Services", Prentice Hall Publication, 2004
2. Dave Chappell, "Enterprise Service Bus", O'Reilly Publications, 2004
3. Sanjiva Weerawarana, Francisco Curbera, Frank Leymann, Tony Storey, Donald F. Ferguson, "Web Services Platform Architecture: SOAP, WSDL, WS-Policy, WS-Addressing, WS-BPEL, WS-Reliable Messaging, and More", Prentice Hall Publication, 2005



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**MIT1062: ENTERPRISE RESOURCE PLANNING**

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

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**UNIT- I**

**INTRODUCTION TO ERP:** Overview- Benefits Of ERP – ERP and Related Technologies - Business Process Reengineering – Data Warehousing – Data Mining – On-Line Analytical Processing – Supply Chain Management.

**UNIT- II**

**ERP IMPLEMENTATION:** Implementation Life Cycle – Implementation Methodology Hidden Costs – Organizing Implementation – Vendors, Consultants and Users – Contracts – Project Management and Monitoring.

**UNIT- III**

**BUSINESS MODULES:** Business Modules In An ERP Package – Finance – Manufacturing – Human Resource – Plant Maintenance – Material Management – Quality Management – Sales and Distribution.

**UNIT- IV**

**ERP MARKET:** ERP Market Place – SAP AG – PeopleSoft – Bean Company – JD Edwards World Solutions Company – Oracle Corporation – QAD System Software Associates.

**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**

1. Alexis Leon, "ERP Demystified" , Tata McGraw Hill, 1999.
2. Joseph A. Brady, Ellen F. Monk, bret J. Wranger, "Concepts in Enterprise Resource Planning", Thomas Learning, 2001.

**REFERENCES**

1. Vinod Kumar Garg and N.K. Venkata Krishnan, "Enterprise Resource Planning – Concepts and Planning", prentice Hall, 1998.
2. Jose Antonio Fernandez , "The SAP R/3 Hand book", Tata McGraw Hill.



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## MIT1063: DIGITAL IMAGE PROCESSING

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

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**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



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**TEXT BOOK**

Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.

**REFERENCES**

1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing, William K. Prat, Wily Third Edition



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## MIT1064: 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**

**N-gram Language Models:** The role of language models, Simple N-gram models. Estimating parameters and smoothing. Evaluating language models.

**Part of Speech Tagging and Sequence Labeling :** Lexical syntax. Hidden Markov Models. Maximum Entropy Models. Conditional Random Fields

**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**

**Semantic Analysis:** Lexical semantics and word-sense disambiguation. Compositional semantics. Semantic Role Labeling and Semantic Parsing.

**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: Turns and utterances, grounding, dialogue acts and structures

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

**TEXT BOOK**

D. Jurafsky & J. H. Martin – “Speech and Language Processing – An introduction to Language processing, Computational Linguistics, and Speech Recognition”, Pearson Education

**REFERENCES**

1. Allen, James. 1995. – “Natural Language Understanding”. Benjamin/Cummings, 2ed.
2. Bharathi, A., Vineet Chaitanya and Rajeev Sangal. 1995. Natural Language Processing- “A Pananian Perspective”. Prentice Hill India, Eastern Economy Edition.
3. Eugene Charniak: “Statistical Language Learning”, MIT Press, 1993.
4. Manning, Christopher and Heinrich Schutze. 1999. “Foundations of Statistical Natural Language Processing”. MIT Press.



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**MIT151: REQUIREMENTS ENGG. & ESTIMATION LAB**

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

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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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**MIT152: WEB SEARCHING AND MINING LAB**

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

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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. Kohonen algorithm
9. Decision tree using C5 algorithm
10. CRT algorithm

K ,1995, IEEE Press (NY), USA



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**II SEMESTER**

## MIT201: SOFTWARE METRICS

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

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**UNIT-I**

**Introduction to software quality:** Quality: Popular Views & Professional Views, Software Quality, Total quality management Fundamentals of Measurement Theory: Definition, Operational Definition and Measurement, Level of Measurement, Some Basic Measures, Reliability and Validity, Measurement Errors, Be Careful with Correlation, Criteria for Causality.

**UNIT- II**

**Software Quality Metrics Overview:** Product Quality Metrics, In-Process Quality Metrics, Metrics for Software Maintenance, Examples of Metrics Programs, Collecting Software Engineering Data.

**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**

**In-Process Metrics for Software Testing:** In-Process metrics for Software Testing, In-Process metrics and Quality Management, Possible Metrics for Acceptance Testing to evaluate Vendor Developed Software, How do you know Your Product is Good Enough to Ship?

**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.

**Using Function Point Metrics to Measure Software Process Improvement:** Software Process Improvement Sequences, Process Improvement Economics, Measuring Process Improvements at Activity Levels.



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**TEXT BOOKS**

Metrics and Models in Software Quality Engineering, Stephen H. Kan, Second Edition , Pearson Education Asia, 2003

**REFERENCES**

1. Software Engineering Measurement, John C. Munson Auerbach Publication, 2003
2. Estimating Software – intensive systems: projects, products and processes, Recharad D. Stutzke, Addison – Wesley 2005
3. Software Metrics: A guide to planning, analysis and application, C. Ravindranath Pandian, Auerbach Publication, 2003
4. Practical Implementation of Software Metrics, Paul Goodman, Mc.Graw Hill, 1993



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**MIT202: DISTRIBUTED DATABASE SYSTEMS**

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

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**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 Method s for Distributed Concurrency Control

**TEXT BOOK**

Distributed Databases by Ceri and Pelgatti Tata McGrawhill



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**MIT203: INFORMATION SECURITY**

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

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**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**

Email privacy: Pretty Good Privacy (PGP) and S/MIME. IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

**UNIT – IV**

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

**UNIT – V**

Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

**TEXT BOOK**

Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.

**REFERENCES**

1. Cryptography and network Security, Third edition, Stallings, PHI/ Pearson
2. Principles of Information Security, Whitman, Thomson.
3. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
4. Introduction to Cryptography, Buchmann, Springer.



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## MIT204: SOFTWARE TESTING &amp; QUALITY ASSURANCE

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

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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  $W_p$  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)



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**HEAD**

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 MYLAVARAM, Krishna (Dist) - 521230.

**REFERENCES**

1. Software Quality, Mordechei Ben – Menachem /Garry S. Marlis , Thomson
2. Software Testing- Principles and practices, Srinivasan D ,  
Gopaldaswamy Ramesh , Pearson, 2006(US)
3. Software Quality Theory and Management, 2/e, Alan C Gillies ,  
Cenagage Learning, 2003(U6,U8)



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**MIT2051: DATA AND KNOWLEDGE MANAGEMENT**

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

**UNIT - I**

**Data Security:** Database systems- architectures- storage structures- storage issues 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**

1. Security in Computing, Charles P. Pfleeger and Shari Lawrence Pfleeger, Third Edition, Pearson Education, 2003.
2. Principles of Distributed Database Systems, M.Tamer OZSU and Patrick Valduriez, Second Edition , Pearson Education, 2001.

**REFERENCES**

1. Artificial Intelligence: A Modern approach, Stuart Russel and Peter Norwig, Third Edition, Pearson Education, 2003.
2. Knowledge Management, Ganesh Natarajan and Sandhya Shekhar, Tata McGrawHill, 2000.



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**MIT2052: EMBEDDED SYSTEMS**

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

**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**

**Basic Assembly Language Programming Concepts:** The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. (Chapters 4,5 6 from Text Book 2, Ayala).

**UNIT – III**

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (Chapters 7,8 from Text Book 2, Ayala).

**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**

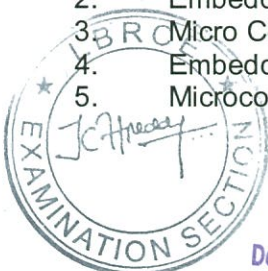
Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power. Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools. (Chapter 8,9,10 Text Book 1, Simon).

**TEXT BOOKS**

1. An Embedded Software Primer, David E. Simon, Pearson Education.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

**REFERENCES**

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.



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**MIT2053: SOFTWARE DOCUMENTATION**

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

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**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**

1. Writing Software Documentation: A Task-Oriented Approach (Part of the Allyn & Bacon Series in Technical Communication), Second Edition by Thomas T. Barker, Longman (Paperback, 2002): ISBN: 0321103289.

**REFERENCES**

1. Recommended Prentice Hall Reference Guide by Muriel Harris, customized for DSU, Prentice, 2007, ISBN:0-536-06188-2.



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**MIT2054: DISTRIBUTED OPERATING SYSTEMS**

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

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**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 vansteem , PHI , 2007



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**REFERENCES**

1. Advanced concepts on operating systems. Mukesh sinhal ,Niranjan G.Shivaratri, TMH, 2005.
2. Distributed Systems Concepts and Design,4/e, George coulouris,Dollimore,Kindberg,pearson,2009.
3. Distributed Operating Systems ,Pradeep K. Sinha, PHI,2009.
4. Operating Systems, Internals & Design Principles,6/e, William Stallings, Pearson.



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**MIT2061: INFORMATION STORAGE & MANAGEMENT**

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

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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**

Introduction to Networked Storage, Evolution of networked storage, Architecture, Overview of FC-SAN, NAS, and IP-SAN. Network-Attached Storage (NAS): Benefits of NAS, Components, Implementations, File Sharing, I/O operations, Performance and Availability. Content Addressed Storage (CAS), features and Benefits of a CAS. CAS Architecture, Storage and Retrieval, Examples.

**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**

Disaster Recovery, Backup, Methods, And Technologies, Replication technologies: Local replicas, Technologies, Restore and Restart, Multiple Replicas. Remote Replication. Storage Security and Management, Security Framework, Storage security domains, Managing The Storage Infrastructure, Monitoring the Storage Infrastructure, Storage Management Activities, Challenges and solutions.



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**TEXT BOOK**

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

**REFERENCES**

1. Richard Barker and Paul Massiglia, .Storage Area Network Essentials: A Complete Guide to Understanding and Implementing SANs., Wiley India.
2. Robert Spalding, .Storage Networks: The Complete Reference., Tata McGraw Hill Osborne,2003.
3. Marc Farley, .Building Storage Networks., Tata McGraw Hill, Osborne, 2001.
4. Meet Gupta, .Storage Area Network Fundamentals., Pearson Education Limited, 2002.



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**MIT2062: OBJECT ORIENTED SOFTWARE ENGINEERING**

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

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**UNIT-I****Introduction to Object Orientation**

Real-world Domains, Object oriented approach and technology, Objects Instances and Concepts. Objects and Classes of Objects Generalized Object-Oriented Software Development Cycle, Object Oriented Programming Language. Object – Oriented Analysis of a Real-World Domain Object Model. The Notion of Encapsulation and Information Hiding. Object Identity: Entity and Attributes, Data and knowledge: The Notion of Inheritance, Relationship between Objects: Association, Generalization / Specialization, Aggregation, Object and States. Dynamic behavior of objects

**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.



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## 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**

1. Roger S Pressman, "Software Engineering -A Practitioner's Approach" , The McGraw Hill Publications V edition.
2. J. Rumbauch. M Blaha, W.Premieriani. F Eddy, W.Lorensen, "Object-Oriented Modeling and Design", Prentice Hall, 1991.

### **REFERENCE BOOKS**

1. Jacobson M. Christerson, P.Jousson, G.Overgaard: "Object-Oriented SoftwareEngineering." A Use Case driven approach , Addison-Wesley , 1992.
2. Waman S Jawadekar: "Software Engineering Principles and Practice". The McGraw Hill Publications V edition.



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**MIT2063: HUMAN COMPUTER INTERFACING**

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

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**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 and 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 Finckay, Gre Goryd, Abowd, Russel Bealg, PEA.
2. The Essential guide to user interface design, Wilbert O Galitz, Wiley Dreama Tech.



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**MIT2064: BIOMETRICS**

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

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**UNIT – I**

Introduction – Benefits of biometric security – Verification and identification – Basic working of biometric matching – Accuracy – False match rate – False non-match rate – Failure to enroll rate – Derived metrics – Layered biometric solutions.

**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**

Other physiological biometrics – Hand scan – Retina scan – AFIS (Automatic Finger Print Identification Systems) – Behavioral Biometrics – Signature scan- keystroke scan.

**UNIT – V**

Biometrics Application – Biometric Solution Matrix – Bio privacy – Comparison of privacy factor in different biometrics technologies – Designing privacy sympathetic biometric systems. Biometric standards – (BioAPI , BAPI) – Biometric middleware Biometrics for Network Security. Statistical measures of Biometrics. Biometric Transactions.

**TEXT BOOKS**

1. Biometrics – Identity Verification in a Networked World – Samir Nanavati, Michael Thieme, Raj Nanavati, WILEY- Dream Tech
2. Biometrics for Network Security- Paul Reid, Pearson Education.

**REFERENCES**

Biometrics- The Ultimate Reference- John D. Woodward, Jr. Wiley Dreamtech.



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## MIT251 : INFORMATION SECURITY LAB.

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

S.NO	PROGRAM
1	Caesar Technique Implementation
2	Mono Alphabetic Technique Implementation
3	Play Fair Technique Implementation
4	HillCipher Technique Implementation
5	Poly Alphabetic Technique
6	RailFence Transposition Technique Implementation
7	Complex RailFence Technique Implementation
8	Steganography Implementation
9	Simple D.E.S Implementation
10	R.S.A Implementation
11	Implementation of DES algorithm on 64 bit plain text
12	Digital signature generation using Java



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**MIT252 : SOFTWARE TESTING LAB**

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

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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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