SOFTWARE REQUIREMENTS AND ESTIMATION

UNIT I
Software Requirements: What and Why
Essential Software requirement, Good practices for requirements engineering, Improving requirements processes, Software requirements and risk management

UNIT II
Software Requirements Engineering
Requirements elicitation, requirements analysis documentation, review, elicitation techniques, analysis models, Software quality attributes, risk reduction through prototyping, setting requirements priorities, verifying requirements quality, Software Requirements Modeling-
Use Case Modeling, Analysis Models, Dataflow diagram, state transition diagram, class diagrams, Object analysis, Problem Frames

UNIT III
Software Requirements Management
Requirements management Principles and practices, Requirements attributes, Change Management Process, Requirements Traceability Matrix, Links in requirements chain Requirements Management Tools: Benefits of using a requirements management tool, commercial requirements management tool, Rational Requisite pro, Caliber – RM, implementing requirements management automation,

UNIT IV
Software Estimation
Components of Software Estimations, Estimation methods, Problems associated with estimation, Key project factors that influence 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 and Cost Estimation
What is Productivity? Estimation Factors, Approaches to Effort and Schedule Estimation, COCOMO II, Putnam Estimation Model, Algorithmic models, Cost Estimation

Software Estimation Tools:
Desirable features in software estimation tools, IFPUG, USC’s COCOMO II, SLIM (Software Life Cycle Management) Tools

TEXT BOOKS:
1. Software Requirements and Estimation by Rajesh Naik and Swapna Kishore, Tata Mc Graw Hill

REFERENCES:
1. Software Requirements by Karl E. Weigers,Microsoft Press.
OBJECT ORIENTED MODELING

UNIT I
Introduction to UML: The meaning of Object Orientation, object identity, Encapsulation, information hiding, polymorphism, generosity, importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture.
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams.
Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.
Sequence Diagrams: Terms, concepts, depicting asynchronous messages with/without priority, callback mechanism, broadcast messages.

UNIT II
Basic Behavioral Modeling: Use cases, Use case Diagrams, Activity Diagrams.
Advanced Behavioral Modeling: Events and signals, state machines, processes and Threads, time and space, state chart diagrams.
Architectural Modeling: Component, Deployment, Component diagrams and Deployment diagrams.

UNIT III
The Unified process: use case driven, architecture centric, iterative, and incremental
The Four Ps: people, project, product, and process
Use case driven process: why use case, capturing use cases, analysis, design, and implementation to realize the use cases, testing the use cases
Architecture-centric process: architecture in brief, why we need architecture, use cases and architecture, the steps to architecture, an architecture description.

UNIT IV
Iterative incremental process: iterative incremental in brief, why iterative incremental development? The iterative approach is risk driven, the generic iteration.
The Generic Iteration workflow: phases are the first division workflow, planning proceeds doing, risks affect project planning, use case prioritization, resource needed, assess the iteration and phases
Inception phase: early in the inception phase, the archetypal inception iteration workflow, execute the core workflows, requirements to test.

UNIT V
Elaboration Phase: elaboration phase in brief, early in the elaboration phase, the architectural elaboration iteration workflow, execute the core workflows-Requirements to test.
Construction phase: early in the construction phase, the archetypal construction iteration workflow, execute the core workflow.
Transition phase: early in the transition phase, activities in transition phase
Case Studies: Automation of a Library, Software Simulator application (2-floor elevator simulator)
TEXT BOOKS:

2. UML 2 Toolkit By Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado WILEY-Dreamtech India Pvt. Ltd.
3. The Unified Software Development Process By Ivar Jacobson, Grady Booch, James Rumbaugh, Pearson Education

REFERENCE BOOKS:

1. Fundamentals of Object Oriented Design in UML By Meilir Page-Jones, Pearson Education
3. Practical Object-Oriented Design with UML By Mark Priestley, TATA McGrawHill
4. Object Oriented Analysis & Design By Brett D McLaughlin, Gary Pollice and David West, O'REILY.
7. UML and C++, R.C.Lee, and W.M.Tepfenhart, PHI.
SOFTWARE PROCESS AND PROJECT MANAGEMENT

UNIT I: Software Process Maturity

Process Reference Models
Capability Maturity Model (CMM), CMMi, PCMM, PSP, TSP.

UNIT II: Software Project Management Renaissance

UNIT III: Life-Cycle Phases and Process artifacts
Engineering and Production stages, inception phase, elaboration phase, construction phase, transition phase, artifact sets, management artifacts, engineering artifacts and pragmatic artifacts, model based software architectures.

Workflows and Checkpoints of process
Software process workflows, Iteration workflows, Major milestones, minor milestones, periodic status assessments.

UNIT IV: Process Planning and Project Organizations
Work breakdown structures, Planning guidelines, cost and schedule estimating process, iteration planning process, Pragmatic planning, line-of- business organizations, project organizations, evolution of organizations, process automation.

UNIT V: Project Control and process instrumentation
The seven core metrics, management indicators, quality indicators, life-cycle expectations, Pragmatic software metrics, metrics automation.

CCPDS-R Case Study and Future Software Project Management Practices
Modern Project Profiles, Next-Generation software Economics, Modern Process Transitions

TEXT BOOKS:

REFERENCE BOOKS:
5. Head First PMP, Jennifer Greene & Andrew Stellman, O’Reilly, 2007
Unit I:
HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets; Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script, CSS

Unit II:
Review of Applets, Class, Event Handling, AWT Programming.
Differences between AWT Controls & Swing Controls Developing a Home page using Applet & Swing.

Unit III:
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API.
Web servers: Tomcat Server installation & Testing.
Introduction to Servelets: Lifecycle of a Serverlet, JSDK The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters.

Unit IV:
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC architecture. AJAX.

Unit V:
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations Database Access Database Programming using JDBC Studying javax.sql.* package Accessing a Database from a JSP Page Application – Specific Database Actions Deploying JAVA Beans in a JSP Page

TEXT BOOKS:
1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT 1,2)
2. The complete Reference Java 2 Fifth Edition ,Patrick Naughton and Herbert Schildt., TMH (Chapters: 25) (UNIT 2,3)
3. Java Server Pages –Hans Bergsten, SPD O’Reilly (UNITs 3,4,5)
REFERENCE BOOKS:
1. Programming world wide web-Sebesta,Pearson
2. Core SERVLETS AND JAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES, Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program, Dietel and Nieto PHI/Pearson.
5. Murach’s beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming – Wang-Thomson
8. Java Server Programming, Ivan Bayross and others, The X Team, SPD
10. Beginning Web Programming-Jon Duckett WROX.
12. Java Script, D. Flanagan, O’Reilly, SPD.
UNIT I Review


UNIT II


UNIT III


UNIT IV


UNIT V

TEXT BOOKS:


REFERENCE BOOKS:

UNIT I: INTRODUCTION TO MOBILE AND WIRELESS LANDSCAPE
Definition of Mobile and Wireless, Components of Wireless Environment, Challenges
Overview of Wireless Networks, Categories of Wireless Networks
Wireless LAN : Infra red Vs radio transmission, Infrastructure and Ad-hoc Network, IEEE 802.11, HIPERLAN, Bluetooth

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM)
GSM Architecture, GSM Entities, Call Routing in GSM, PLMN Interfaces, GSM Addresses and Identifiers, Network Aspects in GSM, GSM Frequency Allocation, Authentication and Security

UNIT II: 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 Ad-hoc networks : Routing, destination Sequence Distance Vector, Dynamic Source Routing.

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 III: BROADCAST SYSTEMS

UNIT IV: PROTOCOLS AND TOOLS:
Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

WIRELESS LANGUAGE AND CONTENT – GENERATION TECHNOLOGIES
Wireless Content Types, Markup Languages: HDML, WML, HTML, cHTML, XHTML, VoiceXML.

UNIT V: MOBILE AND WIRELESS SECURITY

TEXT BOOKS:

REFERENCE BOOKS:
UNIT I
**Introduction to Ad Hoc Networks:** Characteristics of MANETs, Applications of MANETs and challenges of MANETs - **Routing in MANETs:** Criteria for classification, Taxonomy of MANET routing algorithms, Topology based routing algorithms, Position based routing algorithms, Other routing algorithms.

UNIT II
**Data Transmission:** Broadcast storm problem, Broadcasting, Multicasting and Geocasting - **TCP over Ad Hoc:** TCP protocol overview, TCP and MANETs, Solutions for TCP over Ad hoc

UNIT III
**Basics of Wireless, Sensors and Applications:** Applications, Classification of sensor networks, Architecture of sensor network, Physical layer, MAC layer, Link layer.

UNIT IV
**Data Retrieval in Sensor Networks:** Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs, Sensor Networks and mobile robots - **Security:** Security in Ad Hoc networks, Key management, Secure routing, Cooperation in MANETs, Intrusion Detection systems.

UNIT V
**Sensor Network Platforms and Tools:** Sensor Network Hardware, Berkeley motes, Sensor Network Programming Challenges, Node-Level Software Platforms - **Operating System:** TinyOS - **Imperative Language:** nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM

TEXT BOOKS:
UNIT I
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses, Information Retrieval System Capabilities - Search, Browse, Miscellaneous.

UNIT II

UNIT III
Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters - User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, Weighted searches of Boolean systems, Searching the Internet and hypertext - Information Visualization: Introduction, Cognition and perception, Information visualization technologies.

UNIT IV

UNIT V

TEXT BOOKS:

REFERENCE BOOKS:
UNIT I
Features of Distributed versus Centralized Databases, Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases, Distributed Database Design

UNIT II

UNIT III
The Management of Distributed Transactions, A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions, Concurrency Control, Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT IV
Reliability, Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection

UNIT V
Architectural Issues, Alternative Client/Server Architectures, Cache Consistency, Object Management, Object Identifier Management, Pointer Swizzling, Object Migration, Distributed Object Storage, Object Query Processing, Object Query Processor Architectures, Query Processing Issues, Query Execution, Transaction Management, Transaction Management in Object DBMSs, Transactions as Objects, Database Integration, Scheme Translation, Scheme Integration, Query Processing Query Processing Layers in Distributed Multi-DBMSs, Query Optimization Issues Transaction Management Transaction and Computation Model, Multidatabase Concurrency Control, Multidatabase Recovery, Object Orientation and Interoperability, Object Management Architecture CORBA and Database interoperability, Distributed Component Object Model, COM/OLE and Database Interoperability, PUSH-Based Technologies

TEXT BOOKS:
1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti, TMH.
Unit I: Introduction to 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 data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities

Unit II: Storage Systems Architecture  
Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment, Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, 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, Compare and contrast integrated and modular storage systems, High-level architecture and working of an intelligent storage system

Unit III: Introduction to Networked Storage  
Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term Archiving solutions and describe how CAS fulfills the need, Understand the appropriateness of the different networked storage options for different application environments

Unit IV: Information Availability & Monitoring & Managing Datacenter  
List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR), RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures, Architecture of backup/recovery and the different backup/recovery topologies, replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities, Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center

Unit V: Securing Storage and Storage Virtualization  
Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes

Case Studies
The technologies described in the course are reinforced with EMC examples of actual solutions. Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOKS:
1. EMC Corporation, Information Storage and Management, G.Somasundaram, A.Shrivastava, Wiley Publishing.  
List of Sample Problems/Experiments:
**1.** Develop static pages (using Only HTML) of an online Book store. The pages should resemble: www.amazon.com The website should consist the following pages.
- Home page, Registration and user Login
- User Profile Page, Books catalog
- Shopping Cart, Payment By credit card
- Order Conformation

**2.** Validate the Registration, user login, user profile and payment by credit card pages using JavaScript.

**3.** Create and save an XML document at the server, which contains 10 users information. Write a program, which takes User Id as an input and returns the user details by taking the user information from the XML document.

**4.** Bean Assignments
   a. Create a JavaBean which gives the exchange value of INR(Indian Rupees) into equivalent American/Canadian/Australian Dollar value.
   b. Create a simple Bean with a label - which is the count of number of clicks. Then create a BeanInfo class such that only the “count” property is visible in the Property Window.
   c. Create two Beans-a)KeyPad .b)DisplayPad .After that integrate the two Beans to make it work as a Calculator.
   d. Create two Beans Traffic Light(Implemented as a Label with only three background colours-Red,Green,Yellow) and Automobile(Implemented as a TextBox which states its state/movement). The state of the Automobile should depend on the following Light Transition Table.

<table>
<thead>
<tr>
<th>Light Transition</th>
<th>Automobile State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red --- Yellow</td>
<td>Ready</td>
</tr>
<tr>
<td>Yellow --- Green</td>
<td>Move</td>
</tr>
<tr>
<td>Green --&gt; Red</td>
<td>Stopped</td>
</tr>
</tbody>
</table>

**5.** Install TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using Servlets and cookies. Hint: Users information (user id, password, credit card number) would be stored in web.xml. Each user should have a separate Shopping Cart.

**6.** Redo the previous task using JSP by converting the static web pages of assignments 2 into dynamic web pages. Create a database with user information and books information. The books catalogue should be dynamically loaded from the database. Follow the MVC architecture while doing the website.


NOTE: * Simple Problems.
** - Moderate Problems.
*** - Complex Problems.

TEXT BOOKS:
2. JDBC, Servlets, and JSP ,Black Book, K. Santosh Kumar, dreamtech.
UNIT I
Introduction
The different forms of computing – Monolithic, Distributed, Parallel and cooperative computing, the meaning of Distributed computing, Examples of Distributed systems, the strengths and weaknesses of Distributed computing, operating system concepts relevant to distributed computing, the architecture of distributed applications.

UNIT II
Distributed Computing Paradigms
Paradigms for Distributed Applications – Message Passing Paradigm, The Client-Server Paradigm (Java Socket API), The peer-to-peer Paradigm, Message system (or MOM) Paradigm – the point-to-point message model and the publish/subscribe message model, RPC model, The Distributed Objects Paradigms – RMI, ORB, the object space Paradigm, The Mobile Agent Paradigm, the Network Services Paradigm, The collaborative application ( Groupware Paradigm), choosing a Paradigm for an application.

UNIT III
Distributed Objects Paradigm (RMI)
Message passing versus Distributed Objects, An Archetypal Distributed Object Architecture, Distributed Object Systems, RPC, RMI, The Java RMI Architecture, Java RMI API, A sample RMI Application, steps for building an RMI application, testing and debugging, comparison of RMI and socket API
Distributed Object Paradigm(CORBA)
The basic Architecture, The CORBA object interface, Inter-ORB protocols, object servers and object clients, CORBA object references, CORBA Naming Service and the Interoperable Naming Service, CORBA object services, object Adapters, Java IDL, An example CORBA application.

UNIT IV
Distributed Document-based Systems
WWW, Lotus Notes, comparison of WWW and Lotus Notes, Distributed Coordination-based systems – Introduction to coordination models, TIB, JINI, comparison of TIB and JINI Software Agents, Agent Technology, Mobile Agents.
Distributed Multimedia Systems – characteristics of multimedia data, QOS of service management, Resource Management, Stream Adaptation

UNIT V
Grid Computing
Definition of grid, grid types – computational grid, data grid, grid benefits and applications, drawbacks of grid computing, grid components, grid architecture and its relation to various Distributed Technologies.
Cluster Computing
Parallel computing overview, cluster computing – Introduction, Cluster Architecture, parallel programming models and Paradigms, Applications of Clusters.

TEXT BOOKS:
REFERENCE BOOKS:

UNIT I

UNIT II

UNIT III
Software Testing Strategy and Environment: Establishing testing policy, structured approach to testing, test factors, Economics of System Development Life Cycle (SDLC) Testing
Software Testing Methodology
Defects hard to find, verification and validation, functional and structural testing, workbench concept, eight considerations in developing testing methodologies, testing tactics checklist

UNIT IV
Software Testing Techniques
Black-Box, Boundary value, Bottom-up, Branch coverage, Cause-Effect graphing, CRUD, Database, Exception, Gray-Box, Histograms, Inspections, JADs, Pareto Analysis, Prototyping, Random Testing, Risk-based Testing, Regression Testing, Structured Walkthroughs, Thread Testing, Performance Testing, White-Box Testing
Software Testing Tools
Taxonomy of Testing tools, Methodology to evaluate automated testing tools, Load Runner, Win runner and Rational Testing Tools, Silk test, Java Testing Tools, JMetra, JUNIT and Cactus.

UNIT V
Testing Process
Testing Specialized Systems and Applications
Testing Client/Server – Web applications, Testing off the Shelf Components, Testing Security, Testing a Data Warehouse
TEXT BOOKS:


REFERENCE BOOKS:

UNIT I Envisioning Architecture

Creating an Architecture
Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT II Analyzing Architectures
Architecture Evaluation, Architecture design decision making, ATAM, CBAM.

UNIT III Moving from one system to many
Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT IV Patterns
Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.

Creational and Structural patterns
Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, flyweight, Proxy.

UNIT V Behavioral patterns
Chain of responsibility, command, Interpreter, iterator, mediator, memento, observer, state, strategy, template method, visitor.

Case Studies
A-7E – A case study in utilizing architectural structures, The World Wide Web - a case study in interoperability, Air Traffic Control – a case study in designing for high availability, Celsius Tech – a case study in product line development

TEXT BOOKS:

REFERENCE BOOKS:
2. Software Architecture, David M. Dikel, David Kane and James R. Wilson, Prentice Hall PTR, 2001
5. Design Patterns in Java, Steven John Metsker & William C. Wake, Pearson education, 2006
J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY  
(AUTONOMOUS)  
M. Tech. (SE) II SEMESTER  
SERVICE ORIENTED ARCHITECTURE  

Unit I:  
SOA and Web Services Fundamentals  

Unit II:  
SOA and WS-* Extensions  

Unit III:  
SOA and Services - Orientation  

Unit IV:  
Building SOA (Planning and Analysis)  

Unit V:  
Building SOA (Technology and Design)  
TEXT BOOKS:
2. Understanding SOA with Web Services, Eric Newcomer, Greg Lomow, Pearson Education.

REFERENCE BOOKS:
1. The Definitive guide to SOA, Jeff Davies & others, Apress, Dreamtech.
2. Java SOA Cook book, E. Hewitt, SPD.
3. SOA in Practice, N. M. Josuttis, SPD.
4. Applied SOA, M. Rosen and others, Wiley India Pvt. Ltd.
7. SOA-Based Enterprise Integration, W. Roshen, TMH.
Unit I. Introduction to PERL and Scripting
Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines, advance perl - finer points of looping, pack and unpack, filesystem, eval, datastructures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

Unit II. PHP Basics

Unit III. Advanced PHP Programming
Php and Web Forms, Files, PHP Authentication and Methodologies - Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World – Translating Websites - Updating Web sites Scripts, Creating the Localization Repository, Translating Files, text, Generate Binary Files, Set the desired language within your scripts, Localizing Dates, Numbers and Times.

Unit IV. TCL – Tk
TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface. Tk- Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding, Perl-Tk.

Unit V. Python

TEXT BOOKS:
1. The World of Scripting Languages, David Barron, Wiley Publications.
REFERENCE BOOKS:
1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP, J. Lee and B. Ware (Addison Wesley) Pearson Education.
2. Programming Python, M. Lutz, SPD.
4. PHP 5.1, I. Bayross and S. Shah, The X Team, SPD.
5. Core Python Programming, Chun, Pearson Education.
7. Perl by Example, E. Quigley, Pearson Education.
8. Programming Perl, Larry Wall, T. Christiansen and J. Orwant, O’Reilly, SPD.
9. Tcl and the Tk Tool kit, Ousterhout, Pearson Education.
10. PHP and MySQL by Example, E. Quigley, Prentice Hall (Pearson).
12. PHP Programming solutions, V. Vaswani, TMH.
Unit I. Introduction to Multimedia

Unit II. Multimedia Applications in Networks.

Unit III. Web 2.0
What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

Unit IV. Rich Internet Applications (RIAs) with Adobe Flash and Flex
Adobe Flash — Introduction, Flash Movie Development, Learning Flash with Hands-on Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.
Adobe Flex 2 — Introduction, Flex Platform Overview, Creating a Simple User Interface, Accessing XML data from your application, Interacting with Server Side Applications, Customizing your User Interface, Creating Charts and Graphs, Connection Independent RIAs on the desktop — Adobe Integrated Runtime (AIR), Flex 3 Beta.

Unit V. Ajax— Enabled Rich Internet Application
TEXT BOOKS:

REFERENCE BOOKS:
5. Programming Flex 3, C. Kazoun and J. Lott, SPD.
7. Adobe Flex 3: Training from the Source, Tapper & others, Pearson Education.
8. Principles of Multimedia, R. Parekh, TMH.
Unit I: Web Intelligence

Unit II: Knowledge Representation for the Semantic Web

Unit III: Ontology Engineering
Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping, Logic, Rule and Inference Engines.

Unit IV: Semantic Web Applications, Services and Technology

Unit V: Social Network Analysis and semantic web
What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks, Blogs and Online Communities, Web Based Networks, Building Semantic Web Applications with social network features.

TEXT BOOKS:

REFERENCE BOOKS:
4. Programming the Semantic Web, T. Segaran, C. Evans, J. Taylor, O'Reilly, SPD.
UNIT – I
Fundamental steps of image processing, components of an image processing of system. The image model and image acquisition, sampling and quantization, relationship between pixels, distance functions, scanner.

UNIT – II
Statistical and spatial operations, Intensity functions transformations, histogram processing, smoothing & sharpening – spatial filters Frequency domain filters, homomorphic filtering, image filtering & restoration. Inverse and weiner filtering, FIR weiner filter, Filtering using image transforms, smoothing splines and interpolation.
Morphological and other area operations, basic morphological operations, opening and closing operations, dilation erosion, Hit or Miss transform, morphological algorithms, extension to grey scale images.

UNIT- III
Segmentation and Edge detection region operations, basic edge detection, second order detection, crack edge detection, gradient operators, compass and laplace operators, edge linking and boundary detection, thresholding, regionbased segmentation, segmentation by morphological watersheds.
Image compression: Types and requirements, statistical compression, spatial compression, contour coding, quantizing compression, image data compression-predictive technique, pixel coding, transfer coding theory, lossy and lossless predictive type coding, Digital Image Water marking.

UNIT –IV
Representation and Description
Chain codes, Ploygonal approximation, Signature Boundary Segments, Skeltons, Boundary Descriptors, Regional Descriptors, Relational Descriptors, Principal components for Description, Relational Descriptors

UNIT V
Pattern Recognition Fundamentals: Basic Concepts of pattern recognition, Fundamental problems in pattern recognition system, design concepts and methodologies, example of automatic pattern recognition systems, a simple automatic pattern recognition model

Pattern classification:
Pattern classification by distance function: Measures of similarity, Clustering criteria, K-means algorithm, Pattern classification by likelihood function: Pattern classification as a Statistical decision problem, Bayes classifier for normal patterns.

TEXT BOOKS :

REFERENCE BOOKS :
6. Pattern Recognition,R.Shinghal,Oxford University Press.
J.B.INSTITUTE OF ENGINEERING & TECHNOLOGY
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M. Tech. (SE)          II SEMESTER

INTRODUCTION TO NEURAL NETWORKS
(ELECTIVE-IV)

UNIT I
INTRODUCTION - what is a neural network? Human Brain, Models of a Neuron, Neural networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks (p. no’s 1 –49)

LEARNING PROCESS 1 – Error Correction learning, Memory based learning, Hebbian learning,(50-55)

UNIT II
LEARNING PROCESS 2: Competitive, Boltzmann learning, Credit Assignment Problem, Memory, Adaptation, Statistical nature of the learning process, (p. no’s 50 –116)

SINGLE LAYER PERCEPTRONS – Adaptive filtering problem, Unconstrained Organization Techniques, Linear least square filters, least mean square algorithm, learning curves, Learning rate annealing techniques, perceptron –convergence theorem, Relation between perceptron and Bayes classifier for a Gaussian Environment (p. no’s 117 –155)

UNIT III
MULTILAYER PERCEPTRON – Back propagation algorithm XOR problem, Heuristics, Output representation and decision rule, Comuter experiment, feature detection, (p. no’s 156 –201)

BACK PROPAGATION - back propagation and differentiation, Hessian matrix, Generalization, Cross validation, Network pruning Techniques, Virtues and limitations of back propagation learning, Accelerated convergence, supervised learning. (p. no’s 202 – 234)

UNIT IV
SELF ORGANIZATION MAPS – Two basic feature mapping models, Self organization map, SOM algorithm, properties of feature map, computer simulations, learning vector quantization, Adaptive patter classification, Hierechel Vector quantilizer, contextmel Maps (p. no’s 443 –469, 9.1 –9.8 )

UNIT V
NEURO DYNAMICS – Dynamical systems, stavility of equilibrium states, attractors, neurodynamical models , manipulation of attarctors as a recurrent network paradigm (p. no’s 664 –680, 14.1 –14.6 )

HOPFIELD MODELS – Hopfield models, computer experiment I (p. no’s 680-701, 14.7 –14.8 )

TEXT BOOKS:

REFERENCE BOOKS:
1. Artifical neural networks - B.Vegnanarayana Prentice Hall of India P Ltd 2005
2. Neural networks in Computer intelligence, Li Min Fu TMH 2003
UNIT I
INTRODUCTION

UNIT II

UNIT III

UNIT IV
Introduction to speech recognition: Variability in speech signals, segmenting speech into smaller units, Performance evaluation, Database for speech recognition, pattern recognition methods, pre-processing, parametric representation: parameters used in speech recognition, feature extraction, Evaluation of similarity of speech patterns: frame-based distance measures - HMM based Speech recognition: HMM representation, Balm-Welch re-estimation training, testing, Viterbi algorithm, speech segmentation, making ASR decisions

UNIT V
Speaker recognition: Introduction, Verification Vs. Recognition, Recognition techniques: Model evaluation, text dependence, statical Vs. dynamic features, stochastic models, vector quantization, similarity and distance measures, cepstral analysis, Features that distinguish the speakers: measures of the effectiveness of features, techniques to choose features, spectral features, prosodic features

TEXT BOOKS:

REFERENCE BOOKS:
2. Speech and Language Processing,Daniel Jurafsky,James H. Martin,Pearson Edn.
UNIFIED MODELING LANGUAGE Lab

Students are divided into batches of 5 each and each batch has to draw the following diagrams using UML for an ATM system whose description is given below.

UML diagrams to be developed are:
1. Use Case Diagram.
2. Class Diagram.
3. Sequence Diagram.
5. State Diagram
6. Activity Diagram.
7. Component Diagram
8. Deployment Diagram.

Description for an ATM System

The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash (in multiples of Rs. 100, Rs. 500 and Rs. 1000), a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ATM will communicate with the bank's computer over an appropriate communication link. (The software on the latter is not part of the requirements for this problem.)

The ATM will service one customer at a time. A customer will be required to insert an ATM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction. The customer will then be able to perform one or more transactions. The card will be retained in the machine until the customer indicates that he/she desires no further transactions, at which point it will be returned - except as noted below.

The ATM must be able to provide the following services to the customer:

1. A customer must be able to make a cash withdrawal from any suitable account linked to the card, in multiples of Rs. 100 or Rs. 500 or Rs. 1000. Approval must be obtained from the bank before cash is dispensed.
2. A customer must be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ATM, subject to manual verification when the envelope is removed from the machine by an operator. Approval must be obtained from the bank before physically accepting the envelope.
3. A customer must be able to make a transfer of money between any two accounts linked to the card.
4. A customer must be able to make a balance inquiry of any account linked to the card.
5. A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

The ATM will communicate each transaction to the bank and obtain verification that it was allowed by the bank. Ordinarily, a transaction will be considered complete by the bank once it has been approved. In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

If the bank determines that the customer's PIN is invalid, the customer will be required to re-enter the PIN before a transaction can proceed. If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine, and the customer will have to contact the bank to get it back.

If a transaction fails for any reason other than an invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

The ATM will provide the customer with a printed receipt for each successful transaction.

The ATM will have a key-operated switch that will allow an operator to start and stop the servicing of customers. After turning the switch to the "on" position, the operator will be required to verify and enter the total cash on hand. The machine can only be turned off when it is not servicing a customer. When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposit envelopes and reload the machine with cash, blank receipts, etc.

SOFTWARE TESTING LAB

List of Experiments

1. Write programs in ‘C’ Language to demonstrate the working of the following constructs:
   i) do...while ii) while…do iii) if…else iv) switch v) for
2. “A program written in ‘C’ language for Matrix Multiplication fails” Introspect the causes for its failure and write down the possible reasons for its failure.
3. Take any system (e.g. ATM system) and study its system specifications and report the various bugs.
4. Write the test cases for any known application (e.g. Banking application)
5. Create a test plan document for any application (e.g. Library Management System)
6. Study of any testing tool (e.g. Win runner)
7. Study of any web testing tool (e.g. Selenium)
8. Study of any bug tracking tool (e.g. Bugzilla, bugbit)
9. Study of any test management tool (e.g. Test Director)
10. Study of any open source-testing tool (e.g. Test Link)
11. Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents* and final test report document.

*Note: To create the various testing related documents refer to the text “Effective Software Testing Methodologies by William E. Perry”