

**SCHEME OF INSTRUCTION AND EXAMINATION**  
**M.C.A III<sup>rd</sup> YEAR**  
**FACULTY OF INFORMATION TECHNOLOGY**

**SEMESTER – I**

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction		Scheme of Examination		
			Periods per week		Duration In Hours	Maximum Marks	
			L/T	D/P		Univ. Exam	Sessionals
<b>THEORY</b>							
1	CS 801	Information Security	4	-	3	80	20
2	CS 802	Middleware Technologies	4	-	3	80	20
3	CS 803	Object Oriented System Development	4	-	3	80	20
4		<b>Elective – I (One of the following)</b>	4	-	3	80	20
	CS 804	Cloud Computing					
	CS 805	Electronic Commerce					
	CS 806	Human Computer Interaction					
	CS 807	Software Reuse Techniques					
	CS 808	Soft Computing					
	CS 809	XML & Web Services					
5		<b>Elective – II (One of the following)</b>	4	-	3	80	20
	CS 810	Mobile Computing					
	CS 811	Software Testing					
	CS 812	System Administration					
	CS 813	Rich Internet Applications					
	CS 814	Software Project Management					
	CS 815	Research Methodology					
<b>PRACTICALS</b>							
1	CS 831	Programming Lab IX- OOSD Lab	-	3	3	50	25
2	CS 832	Programming Lab X- Middleware Technologies Lab	-	3	3	50	25
3	CS 833	Seminar	-	3	3	-	25
		<b>TOTAL</b>	<b>20</b>	<b>9</b>	<b>-</b>	<b>500</b>	<b>175</b>

Head of the Department

CS 801

## INFORMATION SECURITY

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

### UNIT-I

Introduction:History, Critical characteristics of information, NSTISSC security model, Components of an information system, Securing the components, Balancing security and access, The SDLC, The security SDLC.

Need for Security: Business needs, Threats, Attacks- secure software development.

### UNIT-II

Legal, Ethical and professional Issues: Law and ethics in information security, Relevant U.S laws-international laws and legal bodies, Ethics and information security.

Risk Management: Overview, Risk identification, Risk assessment, Risk control strategies, selecting a risk control strategy, Quantitative versus qualitative risk control practices, Risk management discussion points, Recommended risk control practices.

### UNIT-III

Planning for Security: Security policy,Standards and practices, Security blue print, Security education, Continuity strategies.

Security Technology:Firewalls and VPNs: Physical design, Firewalls, Protecting remote connections

### UNIT-IV

Security Technology: Intrusion detection, access control and other security tolls: Intrusion detection and prevention systems, Scanning and analysis tools, Access control devices.

Cryptography: Foundations of cryptology, Cipher methods, Cryptographic Algorithms, Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems.

### UNIT- V

Implementing Information Security: Information security project management, Technical topics of implementation, Non technical aspects of implementation, Security certification and accreditation.

Security and Personnel: Positioning and staffing security function, Employment policies and practices, Internal control strategies.Information security maintenance : Security management models, The maintenance model, Digital forensics

### Suggested Reading:

1. Michel E Withman and Herbert J Mattord, Principles and Practices of Information Security, Cengage Learning, 2009.
2. Thomas R Peltier, Justin Peltier, John Blackley, Information Security Fundamentals, Auerbach Publications, 2010.
3. Detmar W Straub, Seymour Goodman, Richard L Baskerville, Information Security, Policy, Processes and Practices, PHI , 2008.
4. Mark Merkow and Jim Breithaupt, Information Security Principle and Practices, Pearson Education, 2007.

**CS 802**

**MIDDLEWARE TECHNOLOGIES**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**Unit – I**

Client/Server Concepts: Client-Server, File Server, Database server, Group server, Object Server, Web server, Middleware – General middleware – Service specific middleware. Client/Server Building blocks – RPC – Messaging – Peer- to- Peer. Web Services – SOA, SOAP, WSDL, REST Services.

**Unit – II**

EJB Architecture: EJB – EJB Architecture – Overview of EJB software architecture – View of EJB – Conversion – Building and Deploying EJBs – Role in EJB.

**Unit – III**

EJB Applications: EJB Session Beans – EJB entity beans – EJB Clients – EJB Deployment Building an application with EJB.

**Unit – IV**

CORBA: EJB – Distributed Systems – Purpose – Exploring CORBA alternatives – Architecture overview – CORBA and networking model – CORBA object model – IDL – ORB – Building an application with CORBA.

**Unit – V**

COM: COM - Data types – Interfaces – Proxy and Stub – Marshalling – Implementing Server/Client – Interface Pointers – Object Creation, Invocation, Destruction – Comparison COM and CORBA – Introduction to .NET – Overview of .NET architecture – Marshalling – Remoting.

**Suggested Reading:**

1. Robert Orfali, Dan Harkey and Jeri Edwards, The Essential Client / Server Survival Guide, Galgotia Publications Pvt.Ltd, 2002 (Unit 1).
2. Tom Valesky, Enterprise Java Beans, Pearson Education, 2002 (Unit 2 & 3).
3. Jason Pritchard, COM and CORBA side by side, Addison Wesley, 2000 (Unit 4 & 5).
4. Jesse Liberty, Programming C#, 2<sup>nd</sup> Edition, O' Reilly Press, 2002 (Unit5).
5. Arno Puder, Kay Romer and Frank Pilhofer, Distributed Systems Architecture, Morgan Kaufman, 2006.
6. Mowbray, Inside CORBA, Pearson Education, 2002.
7. Jeremy Rosenberger, Teach yourself CORBA in 14 days, Tec Media, 2000.

**CS 803**

**OBJECT ORIENTED SYSTEM DEVELOPMENT**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**Unit – I**

UML Introduction : Why we model, Introducing the UML, Hello World. Basic Structural Modeling: Classes, Relationships, Common Mechanisms, Diagrams, Class Diagrams.

Advanced Structural Modeling : Advanced Classes, Advanced Relationships, Relationships, Interfaces, Types and Roles, Packages, Instances, Object Diagrams , Components.

**Unit – II**

Basic Behavioral Modeling: Interactions, Use Cases, Use Case Diagrams, Interaction Diagrams, Activity Diagrams.

Advanced Behavioral Modeling: Events and signals, State Machines, Processes and Threads, Times and space, State Chart Diagrams.

**Unit – III**

Architectural Modeling: Artifacts, Deployment Collaborations, Patterns and Frame works, Artifact diagrams, Deployment diagrams, Systems and models.

**Unit – IV**

Unified Software Development Process: The Unified Process, The Four Ps, A Use- Case- Driven Process, An Architecture, An Architecture – Centric Process, An Iterative and incremental Process.

**Unit – V**

Core Workflows: Requirements Capture , Capturing Requirements as Use Cases, Analysis, Design, Implementation, Test.

**Suggested Reading:**

1. Grady Booch, James Rumbaugh, Ivor Jacobson, The Unified Modeling Language – User Guide, (Covering UML 2.0) 2<sup>nd</sup> Edition , Pearson Education, India, 2007.
2. Ivor Jacobson, Grady Booch, James Rumbaugh, The Unified Software Development Process, Pearson Education, India, 2008.

**CS 708**

**CLOUD COMPUTING**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessionals	20 Marks

**UNIT-I**

Introduction to Cloud Computing: Cloud Computing in a Nutshell, System Models for Distributed and Cloud Computing, Roots of Cloud Computing, Grid and Cloud, Layers and Types of Clouds, Desired Features of a Cloud, Basic Principles of Cloud Computing, Challenges and Risks, Service Models.

**UNIT-II**

Virtual Machines and Virtualization of Clusters and Data Centers, Levels of Virtualization, Virtualization Structures/Tools and Mechanisms, Virtualization of CPU, Memory and I/O Devices, Virtual Clusters and Resource Management, Virtualization Data-Center Automation.

**Case studies:** Xen Virtual machine monitors- Xen API. VMware - VMware products-VMware Features. Microsoft Virtual Server - Features of Microsoft Virtual Server.

**UNIT-III**

**Cloud computing architectures over Virtualized Data Centers:** Data-Center design and Interconnection networks, Architectural Design of Compute and Storage Clouds, Public Cloud Platforms, GAE, AWS, Azure, Inter-cloud Resource Management

**UNIT-IV**

**Cloud Security and Trust Management, Data Security in the Cloud :** An Introduction to the Idea of Data Security, The Current State of Data Security in the Cloud CryptDb: Onion Encryption layers-DET,RND,OPE,JOIN,SEARCH, HOM, and Homomorphic Encryption, FPE. Trust, Reputation and Security Management.

**Unit-V**

**Cloud Programming and Software Environments:** Features of Cloud and Grid Platforms, parallel and distributed Programming Paradigms, Programming Support of Google App Engine, Programming on Amazon AWS and Microsoft Azure, Emerging Cloud Software Environments.

**Common Standards in Cloud Computing:** The Open Cloud Consortium, the Distributed Management Task Force, Standards for Application Developers, Standards for Messaging. Internet Messaging Access Protocol (IMAP), Standards for Security, Examples of End-User Access to Cloud Computing.

**Suggested Reading:**

- 1) John W. Rittinghouse, "Cloud Computing: Implementation, Management, and Security ". James F. Ransome, CRC Press 2009.
- 2) Kai Hwang. Geoffrey C.Fox, Jack J. Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Elsevier, 2012.
- 3) Rajkumar Buyya, James Broberg and Andrzej M. Goscinski," Cloud Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing), Wiley Publishing ©2011
- 4) Raluca Ada Popa, Catherine M.S. Redfield, Nikolai Zeldovich, and Hari Balakrishnan, "CryptDB: Protecting Confidentiality with encrypted Query Processing"23rd ACM Symposium on Operating Systems Principles (SOSP 2011), Cascais, Portugal October 2011.
- 5) A Fully Homomorphic Encryption Scheme, Craig Gentry, September 2009.
- 6) David Marshall, Wade A. Reynolds, "Advanced Server Virtualization: VMware and Microsoft Platform in the Virtual Data Center", Auerbach Publications, 2006.

**Web resources:**

- <http://aws.amazon.com>
- <http://code.google.com/appsengine>
- <http://www.buyya.com/>

**CS 805**

**ELECTRONIC COMMERCE**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**UNIT – I**

Electronic Commerce – Electronic Commerce Frame Work , Electronic Commerce and Media Convergence, Anatomy of E- Commerce appellations, Electronic Commerce Consumer applications, Electronic Commerce Organization Applications.

Consumer Oriented Electronic Commerce – Consumer- Oriented Applications, Mercantile Process Models, Mercantile Models from the Consumers's Perspective., Mercantile Models from the Merchants's Perspective.

**UNIT – II**

Electronic Payment systems – Types of Electronic Payment Systems, Digital Token – Based Electronic Payment Systems , Smart Cards Electronic Payment Systems, Credit Card- Based Electronic Payment Systems, Risk and Electronic Payment systems , Designing Electronic Payment Systems .

**UNIT – III**

Inter Organizational Commerce And EDI- Electronic Data Interchange , EDI applications in business, EDI:Legal, Security, and Privacy issues, EDI and Electronic Commerce

EDI Implementation,MIME , and Value added net works.-Standardization and EDI, EDI Software Implementation, EDI Envelope for Message Transport, Value-Added Networks, Internet-Based EDI.

Intraorganizational Electronic Commerce – Internal Information Systems, Work Flow Automation and Coordination, Customization and internal Commerce, Supply chain Management.

**UNIT – IV**

Corporate Digital Library – Dimensions of Internal electronic Commerce Systems, Types of Digital Documents, Issues behind Document Infrastructure, Corporate Data Warehouse

Advertising and Marketing on the Internet – Information based marketing, advertising on Internet, on-line marketing process, market research.

**UNIT –V**

Consumer Search and Resource Discovery – Search and Resource Discovery paradigms, Information search and Retrieval, Electronic Commerce catalogues or Directories, information filtering, Consumer-Data Interface3:Emerging Tools.

Multimedia and Digital Video – key multimedia concepts, Digital Video and Electronic Commerce, Desktop video processing, Desktop video conferencing.

**Suggested Reading:**

1. Ravi Kalakota & A . B. Whinstong – “ *Frontiers of Electronic Commerce*”, Pearson Education, India, 2006.
2. Daniel Minoli, Emma Minoli: “ *Web Commerce Technology Handbook*” Tata McGraw Hill 2007
3. J Christopher W, Theodore HKC, Global Electronic Commerce: Theory and Case Studies. Universities Press, 2001

**CS 806**

**HUMAN COMPUTER INTERACTION**

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional	20	Marks

**UNIT- I**

Importance of the user interface. Characteristics of graphical and web user interfaces, User Interface Design Process: Knowing the client, Understanding business function, Principles of good screen design.

**UNIT-II**

System Menus and Navigation Schemes, Kinds of windows, Device based controls, Screen based controls, Test and Messages.

**UNIT- III**

Feedback, Guidance and assistance. Internationalization and accessibility, graphics, icons and images, colours, Layout windows and pages.

**UNIT- IV**

Interaction Design: Introduction, Goals, Usability, Conceptualization interaction: Problem space, Conceptual models, Interface metaphors, Interaction paradigms, Cognition: Conceptual frameworks for cognition. Collaboration and Communication: Social mechanism, Conceptual framework.

**UNIT- V**

Affective aspects, Expressive interface, User frustration, Agents, Process of interaction design, Activities characteristics, Practical issues, Life cycle models, Design: Prototyping and construction, Prototyping, conceptual design, Physical design Evaluation: Introduction, Framework, Testing and modelling users: Kinds of tests ,Doing user testing, Experiments, Predictive models.

**Suggested Reading:**

1. Wilbert O.Galitz, The Essential Guide to User Interface Design, Wiley Dreamtech 2002.
2. Sharp, Rogers, Preece, Interaction Design, John Wiley, 2007.
3. Andrew Sears, Julie A Jacko, Human, Computer Interaction Fundamentals, CRC Press, 2009.
4. Dan R Oslan, Human, Computer Interaction, Cengage Learning, 2010.

**CS 807**

**SOFTWARE REUSE TECHNIQUES**

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional	20	Marks

**UNIT-I**

Software reuse success factors, Reuse driven software engineering business, Object oriented software engineering, applications and component sub systems, use case components, object components.

**UNIT-II**

Design Patterns – Introduction, Creational patterns, factory, factory method, abstract factory, singleton, builder prototype.

**UNIT-III**

Structural Patterns- Adapters, bridge, composite, decorator, façade, flyweight, proxy.  
Behavioral Patterns – Chain of responsibility, command, interpreter.

**UNIT-IV**

Behavioral Patterns – Iterator, mediator, memento, observer, state, strategy, template, visitor, other, design patterns- Whole part, master- slave, view handler, forwarder- receiver, client – dispatcher- server, publisher – subscriber.

**UNIT-V**

Architectural patterns – Layers, pipes and filters, black board, broker, model - view controller, presentation- abstraction – control, micro kernel, reflection.

**Suggested Reading:**

1. Ivar Jacobson, Martin Griss, Patrick Hohson – Software Reuse. Architecture, Process and Organization for Business Success, ACM Press, 1997.
2. Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides – Design Patterns- Addison, 1995, Pearson Education.
3. Frank Buschmann etc. – Pattern Oriented Software Architecture – Volume 1, Wiley 1996.
4. James W Cooper – Java Design Patterns, a tutorial, Addison 2000, Pearson Education.



**CS 808**

**SOFT COMPUTING**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**UNIT-I**

Fundamentals of Neural Networks: Basic Concepts of Neural Networks, Human Brain, Model of an Artificial Neuron, Neural Network Architectures, Characteristics of Neural Networks, Learning Methods, Taxonomy of Neural Network Architectures, History of Neural Network Research, Early Neural Network Architectures, Some Application Domains.

Back Propagation Networks: Architecture of a Back Propagation Network, Back Propagation Learning, Illustration, Applications.

**UNIT-II**

Associative Memory: Autocorrelators, Heterocorrelators, Wang Et Al's Multiple Training Encoding Strategy, Exponential BAM, Associative Memory for Real-Coded Pattern Pairs, Applications, Recent Trends.

Adaptive Resonance Theory: Introduction, ART1, ART2, Applications, Sensitives of Ordering of Data.

**UNIT-III**

Fuzzy Set Theory: Fuzzy Versus Crisp, Crisp Sets, Fuzzy Sets, Crisp Relations, Fuzzy Relations.

Fuzzy Systems: Crisp Logic, Predicate Logic, Fuzzy Logic, Fuzzy Rule Based Systems, Defuzzification Methods, Applications.

**UNIT-IV**

Fundamentals of Genetic Algorithms: Genetic Algorithms: History, Basic Concepts, Creation of Offsprings, Working Principle, Encoding, Fitness Function, Reproduction.

Genetic Modeling: Inheritance Operators, Cross Over, Inversion, And Deletion, Mutation Operator, Bit-Wise Operators, Bit-Wise Operators used in GA, Generational Cycle, Convergence of Genetic Algorithms, Applications, Multi- Level Optimization, Real Life Problem, Differences and Similarities Between GA and Other Traditional Methods, Advances in GA.

**UNIT-V**

Integration of Neural Networks, Fuzzy Logic and Genetic Algorithms: Hybrid Systems, Neural Networks, Fuzzy Logic, and Genetic Algorithms Hybrids, Preview of Hybrid Systems

Genetic Algorithms Based Backpropagation Networks: Ga Based Weight Determination, Applications.

Fuzzy Logic Controlled Controlled Genetic Algorithms: Soft Computing Tools, Problem Description of Optimum Design, Fuzzy Constraints, Illustrations, GA in Fuzzy Logic Controller Design, Fuzzy Logic Controller, FLC-GA Based Structural Optimization, Applications.

**Suggested Reading:**

1. S.Rajasekaran, G.A. Vijayalakshmi Pai, Neural Networks, fuzzy logic, and genetic algorithms - Genetic Algorithm, PHI Learning Private Limited-2010
2. S.N.Sivanandam, S.N.Deepa Wiley India , Principles of SOFT COMPUTING, Second Edition 2011.

**CS 809**

**XML AND WEB SERVICES**

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional	20	Marks

**UNIT- I :**

Introduction : Role Of XML - XML and The Web - XML Language Basics - SOAP - Web Services - Revolutions Of XML - Service Oriented Architecture (SOA).

**UNIT- II :**

XML Technology : XML Technology, XML - Name Spaces - Structuring With Schemas and DTD - Presentation Techniques - Transformation - XML Infrastructure.

**UNIT- III:**

SOAP: Overview Of SOAP - HTTP - XML-RPC - SOAP: Protocol - Message Structure - Intermediaries - Actors - Design Patterns And Faults - SOAP With Attachments.

**UNIT- IV:**

WEB Services: Overview - Architecture - Key Technologies - UDDI - WSDL - ebXML - SOAP And Web Services In E-Com - Overview Of .NET And J2EE.

**UNIT- V:**

XML Security: Security Overview - Canonicalization - XML Security Framework - XML Encryption - XML Digital Signature - XKMS Structure - Guidelines For Signing XML Documents - XML In Practice.

**Suggested Reading:**

1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, Developing Java Web Services, Wiley Publishing Inc., 2004.
3. Sandeep Chatterjee, James Webber, Developing Enterprise Web Services, Pearson Education, 2004.
4. McGovern, et al., Java Web Services Architecture, Morgan Kaufmann Publishers,2005.  
Gustavo A, Fabio C, Harumi K, Vijay M. Web Services: Concepts, Architectures and Applications. Springer (Universities Press), 2004

**CS 810**

**MOBILE COMPUTING**

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional		20 Marks

**UNIT- I**

Introduction and applications of mobile computing, Wireless transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems.

Medium Access Control, SDMA, FDMA, TDMA, CDMA, Comparisons.

**UNIT- II**

Telecommunication system, GSM, DECT, TDMA, TETRA, UMTS & IMT-2000.

Satellite systems: Applications, Basics, routing, localization, Handover.

Broadcast systems: Cyclic representation of data, Digital audio Broad casting, Digital video Broadcasting, Convergence of Broadcasting and mobile communication.

**UNIT- III**

Wireless LAN: Infrared Vs Radio Transmission, Infrastructure and Ad hoc Networks, IEEE 802.11, HIPERLAN, Bluetooth.

**UNIT- IV**

Mobile IP, Dynamic Host Configuration Protocol, Mobile Adhoc Networks, Mobile Transport Layer, Traditional TCP, Classical TCP improvements, TCP over 2.5/3G Wireless Networks, Performance Enhancing Proxies.

**UNIT- V**

Operating Systems for Mobile Devices: Features of Windows CE, Palm OS, Symbian Os, Java Card support for Mobility: File systems, WWW, Wireless Application Protocol.

**Suggested Reading:**

1. Jochen M.Schiller, Mobile Communications, 2<sup>nd</sup> edition , Pearson Education, India 2003.
2. Hansmann, Merk, Nicklous, Stober, Principles of Mobile Computing, 2<sup>nd</sup> edition Springer International edition, 2003.
3. Dharma P. Agarwal, Qing An Zeng, Introduction to wireless and Mobile systems, 2<sup>nd</sup> edition Thomas India 2007.
4. Frank Adelstien, Sandeep K.S.Gupta, Fundamentals of Mobile and Pervasive Computing, Tata McGraw Hill, 2005.
5. Ivan Stojmenovic, Handbook of Wireless and Mobile Computing, Wiley India, 2006.

**CS 811**

**SOFTWARE TESTING**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**Unit-I**

A Mathematical Context: A Perspective on Testing, Examples

Functional Testing: Boundary Value Testing, Equivalence Class Testing, Decision Table-Based Testing, Retrospective on Functional Testing.

**Unit-II**

Structural Testing: Path Testing, Dataflow Testing, Retrospective on Structural Testing.

**Unit-III**

Integration and System Testing: Levels of Testing, Integration Testing, System Testing, Interaction Testing.

**Unit-IV**

Object-Oriented Testing: Issues in Object-Oriented Testing, Class Testing, Object-Oriented Integration Testing, GUI Testing, Object-Oriented System Testing.

**Unit-V**

Millennium Testing: Exploratory Testing, Model-Based Testing, Test-Driven Development, All Pairs Testing, Software Testing Excellence.

**Suggested Reading:**

1. Paul C. Jorgensen, Software Testing: A Craftsman's Approach, 3<sup>rd</sup> Edition, CRC Press, 2007.
2. Boris Beizer, Software Testing Techniques, Dreamtech, 2009.

## CS 812

### SYSTEM ADMINISTRATION

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional		20 Marks

#### UNIT- I

Functions of system administration, UNIX: Files, Processes Devices, file system, essential administrative tools: Grep, awk, files and directory commands, starting and shutdown process.

#### UNIT- II

User accounts, security, managing system resources : System performance, managing CPU usage, memory, disk I/O automating tasks with scripts.

#### UNIT- III

File system and Disks: Mounting, adding disks, CD-Rom devices, and backup and restore terminals modems and printers.

#### UNIT- IV

TCP/IP Network Management: TCP/IP networking, adding a new host, NFS/NIS, monitoring the network, E-mail, configuring and building Kernel for Linux.

#### UNIT- V

Windows 2003 Server: Startup, shutdown, server configuration , user accounts, managing processes, disks and file system security.

**Note:** First four units are related to UNIX system, Fifth unit is related to Windows 2003 Server.

#### Suggested Reading:

1. Aeleon Frisch, Essential System Administration, O'Reilly, 1995, Second Edition.
2. Aeleon Frisch, Essential Windows Administration, O'Reilly, 1998, First Edition.
3. Nemeth, Unix System Administration, Pearson Education, 2000.

**CS 813**

**RICH INTERNET APPLICATIONS**

Instruction	4 Periods per week
Duration of University Examination	3 Hours
University Examination	80 Marks
Sessional	20 Marks

**UNIT-I**

Web 2.0 Folksonomies and Web 2.0, Software as a service. Multiple delivery channels (Voice – VOXML, and ANT (HTML), Social Net working.

**UNIT - II**

Client side programming – Overview of Java Script, Objects in Java Script, Regular expressions, Overview of XML, DTD and XML Schema, DOM and SAX Parsers,CSS,XSLT.

**UNIT- III**

Web Services- SOA,SOAP,WSDL,REST Services.  
JSON Format- Ajax introduction, XML HTTP object comparison with I frames.

**UNIT-IV**

Building Rich Internet Application- Flash Player, Flex framework, MXML introduction, Action Script Introduction, working with Action Script, Flex Data binding, Common UI Components using Datagrids. Tree controls, Pop up controls etc.

**UNIT-V**

Mashup using Flex and Ajax. Web services in Flex. Semantic web(Web 3.0). Resource Description Frame work, use and examples, Ontologies, Web ontology language(OWL).

**Suggested Reading:**

1. Ivan Bayross,Web Enabled Commercial Applicaton Development using HTML, DHTML, Javascript , Perl CGI ,BPB Publications, 2007.
2. Colin Mook, Essential Actionsript 3.0 , O'Reilly publications, 2007.
3. Steven Holzner, Ajax Bible Wiley India Edition, 2007.
4. Justin Gehtland et al, A Web 2.0 Primer Pragmatic Ajax, SPD Publications, 2006.

**CS 814**

**SOFTWARE PROJECT MANAGEMENT**

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional	20	Marks

**Unit – I**

Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning.

**Unit – II**

Selection of an Appropriate Project Approach, Software Effort Estimation, Activity Planning.

**Unit – III**

Risk Management, Resource Allocation, Monitoring & Control.

**Unit – IV**

Managing Contracts, Managing People in Software Environments, Working in Teams.

**Unit – V**

Software Quality, An Overview of PRINCE 2

**Suggested Reading:**

1. Bob Hughes and Mike Cotterell, Software Project Management , Tata McGraw Hill, 5<sup>th</sup> Edition, 2010.
2. Walker Royce, Software Project Management: A Unified Framework Addison Wesley, 1998.

CS 814

## RESEARCH METHODOLOGY

Instruction	4	Periods per week
Duration of University Examination	3	Hours
University Examination	80	Marks
Sessional	20	Marks

### UNIT-I

**Research Methodology:** Objectives and Motivation of Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific Method, Importance of Research Methodology, Research Process, Criteria of Good Research, Problems Encountered by Researchers in India, Benefits to the society in general.

**Defining the Research Problem:** Definition of Research Problem, Problem Formulation, Necessity of Defining the Problem, Technique Involved in Defining a Problem.

### UNIT-II

**Literature Survey:** Importance of Literature Survey, Sources of Information, Assessment of Quality of Journals and Articles, Information through Internet.

**Literature Review:** Need of Review, Guidelines for Review, Record of Research Review

### UNIT-III

**Research Design:** Meaning of Research Design, Need of Research Design, Features of a Good Design, Important Concepts Relating to Research Design, Different Research Designs, Basic Principles of Experimental Designs, Developing a Research Plan, Design of Experimental Set-up, Use of Standards and Codes.

### UNIT-IV

Exploration of the data. Description and Analysis of Data. Sample Design and Sampling. Role of Statistics for Data Analysis. Functions of Statistics, Estimates of Population Parameters. Parametric V/s Non Parametric methods. Descriptive Statistics, Points of Central tendency, Measures of Variability, Measures of relationship. Inferential Statistics- Estimation, Hypothesis Testing. Use of Statistical software.

**Data Analysis:** Deterministic and random data, uncertainty analysis, tests for significance: Chi-square, student's 't' test. Regression modeling, direct and interaction effects. ANOVA, F-test. Time Series analysis, Autocorrelation and autoregressive modeling.

### UNIT-V

**Research Report Writing:** Format of the Research report. Style of writing report. References / Bibliography / Webiography, Technical paper writing /Journal report writing.

**Research Proposal preparation:** Writing a Research Proposal and Research Report, Writing a Research Grant Proposal.

### Suggested Reading:

1. C.R. Kothari; Research Methodology, Methods & Technique; New age international publishers,2004
2. R. Ganesan; Research Methodology for Engineers; MJP Publishers; Chennai, 2011.
3. Y.P. Agarwal; Statistical Methods; Concepts, Application and Computation; Sterling Publishers Pvt Ltd; New Delhi; 2004
4. Dr. Vijay Upagade and Dr. Aravind Shende; Research Methodology; S. Chand & Company Ltd.; New Delhi; 2009.
5. P. Ramdass and A Wilson Aruni; Research and Writing across the disciplines; MJP Publishers;



**CS 831**

**PROGRAMMING LAB IX – OOSD LAB**

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks

**Students have to perform the following OOAD steps on a given**

**Case Study:**

- \* Use Case Modeling
- \* Structural Modeling
- \* Behavioral Modeling
- \* Architectural Modeling

**The output should consists of:**

- \* Use case Diagrams
- \* Class Diagrams
- \* Sequence Diagrams
- \* Collaboration Diagrams
- \* State Chart Diagrams
- \* Activity Diagrams
- \* Deployment Diagrams
- \* Component Diagrams

Students should form into groups. They should carry out the Case Study as a group activity. The lab should be carried out using a CASE Tool. Finally they should submit a report.

Students should familiarize themselves with Rational Test Suite/ WinRunner/ LoadRunner

**CS 832**

**PROGRAMMING LAB X – MIDDLEWARE TECHNOLOGIES LAB**

Instruction	3	Periods per week
Duration of University Examination	3	Hours
University Examination	50	Marks
Sessional	25	Marks

1. Create a Distributed name Server (like DNS) RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using JDK.
3. Develop an enterprise Java Bean for student Information System.
4. Develop an enterprise Java Bean for Library operations.
5. Create and invoke Web Services.
6. Develop a component for converting the currency values using COM/.NET.
7. Develop a component for browsing CD catalogue using COM/.NET.
8. Develop a component for retrieving information from message box using DCOM/.NET.
9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA.
10. Develop a middleware component for retrieving Bank balance using CORBA.

**CS 833**

**SEMINAR**

Instruction  
Sessional

3 Periods per week  
25 Marks

1. Oral presentation is an important aspect of engineering education. The objective of the seminar is to prepare the student for systematic independent study of the art topics in the broad area of his/her specialization.
2. Seminar topics can be chosen by the students with the advice from the faculty members.
3. Students are the exposed to the following aspects of seminar presentations.
  - Literature survey
  - Organization of the material
  - PPT Presentation
  - Technical writing

**Each student is required to**

4. Submit one page of Synopsis of the seminar talk two days before for display on notice board.
5. Give 20 minutes PPT presentation, followed by 10 minutes discussion.
6. Submit a report on the seminar topic with a list of references and slides used within a week.

Seminars are to be scheduled in the 5<sup>th</sup> week of the semester.

The Sessional marks will be awarded to the students by at least 2 faculty members on the basis of an oral and written presentation as well as their involvement in the discussion.

**CS 852**

**PROJECT**

Instruction	6 Periods per week
Duration of University Examination	Viva-Voce
University Examination	Grade
Sessional	50 Marks

Sixth Semester of the MCA course is exclusively meant for project work. Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 4<sup>th</sup> week in consultation with the Project Guide. The synopsis should consist of definition of the problem, scope of the problem and plan of action. After completion of four weeks students are required to present a Project Seminar on the topic covering the aspects of analysis, design and implementation of the project work.

At the end of the semester the students are required to present themselves for a University Viva-voce examination in which each student will be awarded with a grade.

A committee consisting of two faculty members of the respective college along with a guide will evaluate the project and award internal marks.

**CS 851**

**PROJECT SEMINAR**

Instruction  
week Sessional

3 Periods per  
25 Marks

1. Oral presentation is an important aspect of engineering education. The objective of the seminar is to prepare the student for systematic independent study of the art topics in the broad area of his/her specialization.
2. Seminar topics can be chosen by the students with the advice from the faculty members.
3. Students are the exposed to the following aspects of seminar presentations.
  - Literature survey
  - Organization of the material
  - PPT Presentation
  - Technical writing

**Each student is required to**

4. Submit one page of Synopsis of the seminar talk two days before for display on notice board.
5. Give 20 minutes PPT presentation, followed by 10 minutes discussion.
6. Submit a report on the seminar topic with a list of references and slides used within a week.

Seminars are to be scheduled in the 5<sup>th</sup> week of the semester.

The sessional marks will be awarded to the students by at least 2 faculty members on the basis of an oral and written presentation as well as their involvement in the discussion.