

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD.

B. TECH. COMPUTER SCIENCE AND ENGINEERING

IV Year

I Semester

COURSE STRUCTURE

Code	Subject	T	P	C
	Network Programming		4+1*	- 4 4
	Web Technologies		4+1 *	- 4
	Data Warehousing and Data Mining		4+1 *	- 4
	Advanced Computer Architecture		4+1 *	-
	<b>ELECTIVE – I :</b>		4+1 *	- 4
	Embedded Systems			
	Mobile Computing			
	Multimedia and Application Development			
	<b>ELECTIVE – II :</b>		4+1 *	- 4
	Software Project Management			
	Advanced Computing Concepts			
	Network Management Systems			
	Network Programming Lab		-	3 2
	Web Technologies Lab		-	3 2
	<b>Total</b>		<b>30</b>	<b>6 28</b>

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**NETWORK PROGRAMMING**

**UNIT-I**

**Introduction to Network Programming:** OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

**UNIT-II**

**Sockets :** Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

**UNIT-III**

**TCP client server :** Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

**UNIT-IV**

**I/O Multiplexing and socket options:** I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

**UNIT-V**

**Elementary UDP sockets:** Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

**UNIT-VI**

**Elementary name and Address conversions:** DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

**UNIT-VII**

**IPC :** Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores.

**UNIT-VIII**

**Remote Login:** Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

**TEXT BOOKS:**

1. UNIX Network Programming, Vol. I, Sockets API, 2<sup>nd</sup> Edition. - W.Richard Stevens, Pearson Edn. Asia.
2. UNIX Network Programming, 1<sup>st</sup> Edition, - W.Richard Stevens. PHI.

**REFERENCES:**

1. UNIX Systems Programming using C++ T CHAN, PHI.
2. UNIX for Programmers and Users, 3<sup>rd</sup> Edition Graham GLASS, King abls, Pearson Education
3. Advanced UNIX Programming 2<sup>nd</sup> Edition M. J. ROCHKIND, Pearson Education

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**WEB TECHNOLOGIES**

**Objectives:**

This course demonstrate an in-depth understanding of the tools and Web technologies necessary for business application design and development. The course covers client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. And also XML and web servers and database interfacing.

**UNIT-I:**

**HTML Common tags-** List, Tables, images, forms, Frames; Cascading Style sheets;

**UNIT-II:**

Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

**UNIT-III:**

**XML:** Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

**UNIT-IV:**

**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, Introduction to EJB's

**UNIT-V:**

**Web Servers and Servlets:** Tomcat web server, Introduction to Servlets: Lifecycle of a Servlet, JSDK, The Servlet API, The javax.servelet Package, Reading Servlet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

**UNIT-VI:**

**Introduction to JSP:** The Problem with Servlet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

**UNIT-VII:**

**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

**UNIT VIII:**

**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, Introduction to struts framework..

**TEXT BOOKS:**

1. Web Programming, building internet applications, Chris Bates 2<sup>nd</sup> edition, WILEY Dreamtech (UNIT s 1,2 ,3)
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH (Chapters: 25) (UNIT 4)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8)

**REFERENCE BOOKS:**

1. Programming world wide web-Sebesta,Pearson
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Web Applications Technologies Concepts-Knuckles,John Wiley
8. Programming world wide web-Sebesta,Pearson
9. Web Warrior Guide to Web Programmimg-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.

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DATA WAREHOUSING AND DATA MINING

**UNIT - I**

**Introduction** : Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining.

**Data Preprocessing** : Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

**UNIT – II**

Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining.

**UNIT - III**

**Data Mining Primitives, Languages, and System Architectures** : Data Mining Primitives, Data Mining Query Languages, Designing Graphical User Interfaces Based on a Data Mining Query Language Architectures of Data Mining Systems.

**UNIT - IV**

**Concepts Description : Characterization and Comparison** : Data Generalization and Summarization- Based Characterization, Analytical Characterization: Analysis of Attribute Relevance, Mining Class Comparisons: Discriminating between Different Classes, Mining Descriptive Statistical Measures in Large Databases.

**UNIT - V**

**Mining Association Rules in Large Databases** : Association Rule Mining, Mining Single-Dimensional Boolean Association Rules from Transactional Databases, Mining Multilevel Association Rules from Transaction Databases, Mining Multidimensional Association Rules from Relational Databases and Data Warehouses, From Association Mining to Correlation Analysis, Constraint-Based Association Mining.

**UNIT - VI**

**Classification and Prediction** : Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction, Classifier Accuracy.

**UNIT - VII**

**Cluster Analysis Introduction** : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Outlier Analysis.

**UNIT - VIII**

**Mining Complex Types of Data** : Multidimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

**TEXT BOOKS :**

1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.

**REFERENCES :**

1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.

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**ADVANCED COMPUTER ARCHITECTURE**

**Unit - I**

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

**Unit - II**

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler

**Unit - III**

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

**Unit - IV**

ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W Solutions

**Unit - V**

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

**Unit - VI**

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

**Unit - VII**

Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system.

**Unit - VIII**

Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

**TEXT BOOK :**

1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

**REFERENCES :**

1. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.
2. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
3. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier

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EMBEDDED SYSTEMS  
(Elective-I)

**Unit - I**

**Embedded Computing** : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (**Chapter I from Text Book 1, Wolf**).

**Unit - II**

**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 - III**

**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 and 6 from Text Book 2, Ayala**).

**Unit - IV**

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. (**Chapter 7 and 8 from Text Book 2, Ayala**)

**Unit - V**

**Applications** : Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (**Chapter 10 and 11 from Text Book 2, Ayala**).

**Unit - VI**

**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 3, Simon**).

**Unit - VII**

**Basic Design Using a Real-Time Operating System** : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); 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, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

**Unit - VIII**

**Introduction to advanced architectures** : ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (**Chapter 8 from Text Book 1, Wolf**).

**TEXT BOOKS :**

1. Computers as Components-principles of Embedded computer system design, Wayne Wolf, Elsevier.
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.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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MOBILE COMPUTING  
(Elective - I)

**UNIT - I**

**Introduction to Mobile Communications and Computing** : Mobile Computing (MC) : Introduction to MC, novel applications, limitations, and architecture.

**GSM** : Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

**UNIT - II**

**(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).

**UNIT - IV**

**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 - V**

**Database Issues** : Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

**UNIT - VI**

**Data Dissemination**: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

**UNIT - VII**

**Mobile Ad hoc Networks (MANETs)**: Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

**UNIT - VIII**

**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.

**TEXT BOOKS :**

1. **Jochen Schiller**, "Mobile Communications", *Addison-Wesley*. (Chapters 4,7,9,10,11), second edition, 2004.
2. **Stojmenovic and Cacute**, "Handbook of Wireless Networks and Mobile Computing", *Wiley*, 2002, ISBN 0471419028. (Chapters 11, 15, 17, 26 and 27)

**REFERENCES :**

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press, October 2004,
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", ISBN: 0071412379, McGraw-Hill Professional, 2005.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", *Springer*, second edition, 2003.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", *Wiley DreamTech*, 2003.

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MULTIMEDIA AND APPLICATION DEVELOPMENT  
(ELECTIVE - I)

**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.

**UNIT - II**

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 - III**

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

**UNIT - IV**

**Action Script II :** Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

**UNIT - V**

**Application Development :** An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

**UNIT - VI**

**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 - VII**

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

**UNIT - VIII**

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).

**TEXT BOOKS :**

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

**REFERENCES :**

1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
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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SOFTWARE PROJECT MANAGEMENT  
(Elective-II)

**UNIT - I**

**Conventional Software Management** : The waterfall model, conventional software Management performance.

**Evolution of Software Economics** : Software Economics, pragmatic software cost estimation.

**UNIT - II**

**Improving Software Economics** : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

**The old way and the new** : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

**UNIT - III**

**Life cycle phases** : Engineering and production stages, inception, Elaboration, construction, transition phases.

**Artifacts of the process** : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

**UNIT - IV**

**Model based software architectures** : A Management perspective and technical perspective.

**Work Flows of the process** : Software process workflows, Iteration workflows.

**UNIT - V**

**Checkpoints of the process** : Major mile stones, Minor Milestones, Periodic status assessments.

**Iterative Process Planning** : Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

**UNIT - VI**

**Project Organizations and Responsibilities** : Line-of-Business Organizations, Project Organizations, evolution of Organizations.

**Process Automation** : Automation Building blocks, The Project Environment.

**UNIT - VII**

**Project Control and Process instrumentation** : The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

**Tailoring the Process** : Process discriminants.

**UNIT - VIII**

**Future Software Project Management** : Modern Project Profiles, Next generation Software economics, modern process transitions.

**Case Study**: The command Center Processing and Display system- Replacement (CCPDS-R)

**TEXT BOOK :**

1. Software Project Management, Walker Royce: Pearson Education, 2005.

**REFERENCES :**

1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

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ADVANCED COMPUTING CONCEPTS  
(ELECTIVE - II)

**UNIT I**

**Grid Computing** : Data & Computational Grids, Grid Architectures and its relations to various Distributed Technologies

**UNIT II**

Autonomic Computing, Examples of the Grid Computing Efforts (IBM).

**UNIT III**

Cluster setup & its Advantages, Performance Models & Simulations; Networking Protocols & I/O, Messaging systems.

**UNIT IV**

Process scheduling, Load sharing and Balancing; Distributed shared memory, parallel I/O .

**UNIT - V**

Example cluster System - Beowlf; Cluster Operating systems: COMPaS and NanOS

**UNIT - VI**

Pervasive Computing concepts & Scenarios; Hardware & Software; Human - machine interface.

**UNIT - VII**

Device connectivity; Java for Pervasive devices; Application examples

**UNIT - VIII**

Classical Vs Quantum logic gates ;One ,two & three QUbit Quantum gates; Fredkin & Toffoli gates ;Quantum circuits; Quantum algorithms.

**TEXT BOOK :**

1. J. Joseph & C. Fellenstein:' Grid Computing ', Pearson Education.
2. J.Burkhardt et .al :'Pervasive computing' Pearson Education
3. Marivesar:'Approaching quantum computing ', Pearson Education.

**REFERENCES :**

1. Raj Kumar Buyya:'High performance cluster computing', Pearson Education.
2. Neilsen & Chung L:'Quantum computing and Quantum Information', Cambridge University Press.
3. A networking approach to Grid Computing , Minoli, Wiley.

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NETWORK MANAGEMENT SYSTEMS  
(ELECTIVE - II)

**UNIT - I**

**Data communications and Network Management Overview** : Analogy of Telephone Network Management, Communications protocols and Standards, Case Histories of Networking and Management, Challenges of Information Technology Managers, Network Management: Goals, Organization, and Functions, Network and System Management, Network Management System Platform, Current Status and future of Network Management.

**UNIT - II**

**SNMPV1 Network Management** : Organization and Information and Information Models.

**Managed network** : Case Histories and Examples, The History of SNMP Management, The SNMP Model, The Organization Model, System Overview, The Information Model.

**UNIT - III**

**SNMPv1 Network Management** : Communication and Functional Models. The SNMP Communication Model, Functional model.

**UNIT - IV**

**SNMP Management: SNMPv2** : Major Changes in SNMPv2, SNMPv2 System Architecture, SNMPv2 Structure of Management Information, The SNMPv2 Management Information Base, SNMPv2 Protocol, Compatibility With SNMPv1.

**UNIT - V**

**SNMP Management : RMON** : What is Remote Monitoring? , RMON SMI and MIB, RMON1, RMON2, ATM Remote Monitoring, A Case Study of Internet Traffic Using RMON

**UNIT - VI**

**Telecommunications Management Network** : Why TMN? , Operations Systems, TMN Conceptual Model, TMN Standards, TMN Architecture, TMN Management Service Architecture, An Integrated View of TMN, mplementation Issues.

**UNIT - VII**

**Network Management Tools and Systems:**Network Management Tools, Network Statistics Measurement Systems, History of Enterprise Management, Network Management systems, Commercial Network management Systems, System Management, Enterprise Management Solutions.

**UNIT - VIII**

**Web-Based Management:**NMS with Web Interface and Web-Based Management, Web Interface to SNMP Management, Embedded Web-Based Management, Desktop management Interface, Web-Based Enterprise Management, WBEM: Windows Management Instrumentation, Java management Extensions, Management of a Storage Area Network: , Future Directions.

**TEXT BOOK :**

1. Network Management, Principles and Practice, Mani Subrahmanian, Pearson Education.

**REFERENCES :**

1. Network management, Morris, Pearson Education.
2. Principles of Network System Administration, Mark Burges, Wiley Dreamtech.
3. Distributed Network Management, Paul, John Wiley.

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NETWORK PROGRAMMING LAB

**Objectives:**

- To teach students various forms of IPC through Unix and socket Programming

**Recommended Systems/Software Requirements:**

- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux

**Week1.**

Implement the following forms of IPC.

- a)Pipes
- b)FIFO

**Week2.**

Implement file transfer using Message Queue form of IPC

**Week3.**

Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use senphores to avoid race conditions

**Week4.**

Design TCP iterative Client and server application to reverse the given input sentence

**Week5.**

Design TCP iterative Client and server application to reverse the given input sentence

**Week6.**

Design TCP client and server application to transfer file

**Week7.**

Design a TCP concurrent server to convert a given text into upper case using multiplexing system call "select"

**Week8.**

Design a TCP concurrent server to echo given set of sentences using poll functions

**Week9.**

Design UDP Client and server application to reverse the given input sentence

**Week10**

Design UDP Client server to transfer a file

**Week11**

Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.

**Week12**

Design a RPC application to add and subtract a given pair of integers

**Reference Book:**

- 1.Advance Unix Programming Richard Stevens, Second Edition Pearson Education
2. Advance Unix Programming, N.B. Venkateswarlu, BS Publication.

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WEB TECHNOLOGIES LAB

**Objective :**

To create a fully functional website with mvc architecture. To Develop an online Book store using we can sell books (Ex amazon .com).

**Hardware and Software required :**

1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/XMLSpy – free ] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

**Week-1:**

Design the following static web pages required for an online book store web site.

**1) HOME PAGE:**

The static home page must contain three **frames**.

Top frame : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame : At least four links for navigation, which will display the catalogue of respective links. For e.g.: When you click the link “**CSE**” the catalogue for **CSE** Books should be displayed in the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1

**2) LOGIN PAGE:**

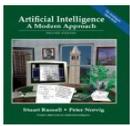
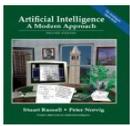
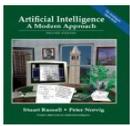
This page looks like below:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	<p style="text-align: center;">Login : <input type="text"/>                  Password: <input type="password"/></p> <p style="text-align: center;"> <input type="button" value="Submit"/> <input type="button" value="Reset"/> </p>			

**3) CATALOGUE PAGE:**

The catalogue page should contain the details of all the books available in the web site in a table. The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name																			
Home	Login	Registration	Catalogue	Cart																
CSE ECE EEE CIVIL	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">  </td> <td style="width: 30%;">                     Book : XML Bible                      Author : Winston                      Publication : Wiely                 </td> <td style="width: 15%; text-align: center;">\$ 40.5</td> <td style="width: 35%; text-align: center;"> <input type="button" value="Add to cart"/> </td> </tr> <tr> <td style="text-align: center;">  </td> <td>                     Book : AI                      Author : S.Russel                      Publication : Princeton hall                 </td> <td style="text-align: center;">\$ 63</td> <td style="text-align: center;"> <input type="button" value="Add to cart"/> </td> </tr> <tr> <td style="text-align: center;">  </td> <td>                     Book : Java 2                      Author : Watson                      Publication : BPB publications                 </td> <td style="text-align: center;">\$ 35.5</td> <td style="text-align: center;"> <input type="button" value="Add to cart"/> </td> </tr> <tr> <td style="text-align: center;">  </td> <td>                     Book : HTML in 24 hours                      Author : Sam Peter                      Publication : Sam publication                 </td> <td style="text-align: center;">\$ 50</td> <td style="text-align: center;"> <input type="button" value="Add to cart"/> </td> </tr> </table>					Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	<input type="button" value="Add to cart"/>		Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>		Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>
	Book : XML Bible Author : Winston Publication : Wiely	\$ 40.5	<input type="button" value="Add to cart"/>																	
	Book : AI Author : S.Russel Publication : Princeton hall	\$ 63	<input type="button" value="Add to cart"/>																	
	Book : Java 2 Author : Watson Publication : BPB publications	\$ 35.5	<input type="button" value="Add to cart"/>																	
	Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	\$ 50	<input type="button" value="Add to cart"/>																	

Note: Week 2 contains the remaining pages and their description.

**Week-2:**

**4) CART PAGE:**

The cart page contains the details about the books which are added to the cart.  
The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	<b>Book name</b>	<b>Price</b>	<b>Quantity</b>	<b>Amount</b>
	Java 2	\$35.5	2	\$70
	XML bible	\$40.5	1	\$40.5
			<b>Total amount -</b>	<b>\$130.5</b>

### 5) REGISTRATION PAGE:

Create a "registration form" with the following fields

- 1) Name (Text field)
- 2) Password (password field)
- 3) E-mail id (text field)
- 4) Phone number (text field)
- 5) Sex (radio button)
- 6) Date of birth (3 select boxes)
- 7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
- 8) Address (text area)

### WEEK 3:

#### VALIDATION:

Write *JavaScript* to validate the following fields of the above registration page.

1. Name (Name should contain alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern [name@domain.com](mailto:name@domain.com))
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

### Week-4:

Design a web page using **CSS (Cascading Style Sheets)** which includes the following:

- 1) Use different font, styles:  
In the style definition you define how each selector should work (font, color etc.).  
Then, in the body of your pages, you refer to these selectors to activate the styles.

For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-decoration:underline}
</style>
</HEAD>
```

```
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}

For example:

<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>

<b class="headline">This is headline style bold</b>
</BODY>

</HTML>
```

- 2) Set a background image for both the page and single elements on the page. You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);}
```

- 3) Control the repetition of the image with the background-repeat property.  
As background-repeat: repeat  
Tiles the image until the entire page is filled, just like an ordinary background image in plain HTML.

- 4) Define styles for links as

```
A:link
A:visited
A:active
A:hover
```

Example:

```
<style type="text/css">
A:link {text-decoration: none}
A:visited {text-decoration: none}
A:active {text-decoration: none}
A:hover {text-decoration: underline; color: red;}
</style>
```

- 5) Work with layers:

For example:

LAYER 1 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>
```

LAYER 2 ON TOP:

```
<div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
<div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:4">LAYER 2</div>
```

- 6) Add a customized cursor:  
Selector {cursor:value}  
For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>

<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

#### **Week-5:**

Write an XML file which will display the Book information which includes the following:

- 1) Title of the book
- 2) Author Name
- 3) ISBN number
- 4) Publisher name
- 5) Edition
- 6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy

#### **Week-6:**

##### **VISUAL BEANS:**

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

#### **Week-7:**

- 1) Install TOMCAT web server and APACHE.  
While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.
- 2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root.  
Access the pages by using the urls : <http://localhost:4040/rama/books.html> (for tomcat)  
<http://localhost:8080/books.html> (for Apache)

#### **Week-8:**

##### **User Authentication :**

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servlet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.
2. Read the user id and passwords entered in the Login form (week1) and authenticate with the values (user id and passwords ) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome him by name(user-name) else you should display " You are not an authenticated user ". Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

**Week-9:**

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

**Week-10:**

Write a JSP which does the following job:

Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from the database ( similar to week8 instead of cookies).

**Week-11:**

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount ) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

**Week-12:**

**HTTP** is a stateless protocol. Session is required to maintain the state.

The user may add some items to cart from the catalog page. He can check the cart page for the

selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate() ).

Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.