JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MCA - II Year - II Sem.

WEB TECHNOLOGIES

Objectives:
- To introduce PHP language for server side scripting.
- To introduce XML and processing of XML Data with Java.
- To introduce Server side programming with Java Servlets and JSP .
- To introduce Client side scripting with Javascript and AJAX.

Outcomes:
- gain knowledge of client side scripting, validation of forms and AJAX programming .
- have understanding of server side scripting with PHP language .
- have understanding of what is XML and how to parse and use XML Data with Java.
- To introduce Server side programming with Java Servlets and JSP.

UNIT I
Introduction to PHP: Declaring variables, data types, arrays, strings, operators, expressions, control structures, functions, Reading data from web form controls like text boxes, radio buttons, lists etc., Handling File Uploads, Connecting to database (MySQL as reference), executing simple queries, handling results, Handling sessions and cookies.
File Handling in PHP: File operations like opening, closing, reading, writing, appending, deleting etc. on text and binary files, listing directories.

UNIT II
XML: Introduction to XML, Defining XML tags, their attributes and values, Document Type Definition, XML Schemas, Document Object Model, XHTML.
Parsing XML Data - DOM and SAX Parsers in java.

UNIT III
Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, deploying a servlet, The Servlet API, Reading Servlet parameters, Reading Initialization parameters, Handling Http Request & Responses, Using Cookies and Sessions, connecting to a database using JDBC.

UNIT IV
Introduction to JSP: The Anatomy of a JSP Page, JSP Processing, Declarations, Directives, Expressions, Code Snippets, implicit objects, Using Beans in JSP Pages, Using Cookies and session for session tracking, connecting to database in JSP.

UNIT V
Client side Scripting: Introduction to Javascript: Javascript language - declaring variables, scope of variables, functions, event handlers (onclick, onsubmit etc.), Document Object Model, Form validation. Simple AJAX application.

TEXT BOOKS:
1.   Web Technologies, Uttam K Roy, Oxford University Press
2.   The Complete Reference PHP – Steven Holzner, Tata McGraw-Hill .
REFERENCE BOOKS:
1.   Web Programming, building internet applications, Chris Bates 2nd edition, Wiley Dreamtech.
2.   Java Server Pages –Hans Bergsten, SPD O'Reilly.
3.   Java Script, D.Flanagan, O'Reilly, SPD.
4.   Beginning Web Programming-Jon Duckett WROX.
5.   Programming World Wide Web, R.W.Sebesta, Fourth Edition, Pearson.
6.   Internet and World Wide Web – How to program, Dietel and Nieto, Pearson.

MCA - II Year - II Sem.

LINUX PROGRAMMING

Objectives:
- To understand the LINUX system structure.
- To understand and use command line shell.
- To make effective use of Unix utilities and Shell scripting language such as bash.
- To produce programs similar to standard unix utilities such as ls, mv, cp etc. using Unix system calls.
- To develop the skills necessary for Unix systems programming including file system programming, process and signal management, and interprocess communication.
- To develop the basic skills required to write network programs using Sockets.

Prerequisites: Familiarity with using Unix Programming environment and having a good working knowledge of the C programming language.

Outcomes:
- Work confidently in Linux environment.
- Work with shell script to automate different tasks as Linux administration.

UNIT I
Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities.
Sed-Scripts, Operation, Addresses, Commands, Applications, awk- Execution, Fields and Records, Scripts, Operation, Patterns, Actions, Associative Arrays, String and Mathematical functions, System commands in awk, Applications..
Introduction, shell responsibilities, pipes and Redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.
Review of C programming concepts-arrays, strings (library functions), pointers, function pointers, structures, unions, libraries in C.

UNIT II
Files and Directories- File Concept, File types, File System Structure, file metadata-Inodes, kernel support for files, system calls for file I/O operations- open, create, read, write, close, lseek, dup2, file status information-stat family, file and record locking-lockf and fcntl functions, file permissions - chmod, fchmod, file ownership-chown, lchown, fchown, links-soft links and hard links – symlink, link, unlink.
Directories-Creating, removing and changing Directories-mkdir, rmdir, chdir, obtaining current working directory-getcwd, Directory contents, Scanning Directories-opendir, readdir, closedir, rewinddir, seekdir, telldir functions.

UNIT III
Process – Process concept, Layout of a C program image in main memory, Process environment-environment list, environment variables, getenv, setenv, Kernel support for process, process identification, process hierarchy, process states, process control - process creation, replacing a process image, waiting for a process, process termination, zombie process, orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family, system, I/O redirection, Process Groups, Sessions and Controlling Terminal, Differences between threads and processes.
Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

UNIT IV
Interprocess Communication - Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems, pipes-creation, IPC between related processes using

unnamed pipes, FIFOs-creation, IPC between unrelated processes using FIFOs (Named pipes), differences between unnamed and named pipes, popen and pclose library functions.
Message Queues- Kernel support for messages, APIs for message queues, client/server example.
Semaphores-Kernel support for semaphores, APIs for semaphores, file locking with semaphores.

UNIT V
Shared Memory- Kernel support for shared memory, APIs for shared memory, shared memory example.
Sockets- Introduction to Berkeley Sockets, IPC over a network, Client-Server model, Socket address structures (Unix domain and Internet domain),Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs-Single Server-Client connection, Multiple simultaneous clients, Comparison of IPC mechanisms.

TEXT BOOKS:
1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH, 2006.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones, Wrox, Wiley India Edition, rp-2008.
4. Unix Network Programming, W.R.Stevens, PHI.
5. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.

REFERENCE BOOKS:
1. Linux System Programming, Robert Love, O'Reilly, SPD, rp-2007.
2. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education, 2003.
3. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
4. System Programming with C and Unix, A.Hoover, Pearson.
5. Unix System Programming, Communication, Concurrency and Threads, K.A.Robbins and S.Robbins, Pearson Education.
6. Unix shell Programming, S.G.Kochan and P.Wood, 3rd edition, Pearson Education.
7. Shell Scripting, S.Parker, Wiley India Pvt. Ltd.
8. C Programming Language, Kernighan and Ritchie, PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

MCA - II Year - II Sem.

MANAGEMENT INFORMATION SYSTEMS
(Core Elective-I)

Objectives:

One of the main aims of this subject is to analyze the system in such a way that a programme description can be made. The student will become conversant with the various ways of analyzing the system. The ultimate aim of the student is to write a system design. There after he is supposed to become conversant with the implementation of the software in the organization and the problems encountered by him. These elements will be useful to the student in career.

- To understand MIS within organization.
- To understand Information Systems and Strategy Formulation
- To understand Conceptual System Design. Understand the basic functioning of the organization. Writing a report.
- To understand Detailed System Design Understand the minute working of the functions of the organization. Writing a report.
- To understand Implementation of software.
- To understand the pitfalls in MIS development.

Prerequisites Organization working which the student will pursue in earlier classes.

UNIT I

The meaning and role of MIS: What is MIS? Decision support systems, systems approach, the systems view of business, MIS Organizational within the Company.

Management, Organizational Theory, and the Systems Approach: Development of Organizational Theory, Management and Organizational Behavior, Management, Information and the Systems Approach

UNIT II

Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report. Organizing data and information: Data warehouses, Data mart and data mining

UNIT III

Detailed system design: Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade off criteria, define the subsystems, sketch the detailed operating subsystems and information flows, determine the degree of automation of each operation, inform and involve the organization again, inputs, outputs, and processing, early system testing, software, hardware and tools, propose an organization to operate the system, document the detailed design, revisit the manager-user.

UNIT IV

Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files, test the system, cutover, document the system, evaluate the MIS, control and maintain the system.

UNIT V

Pitfalls in MIS development: Fundamental weaknesses, soft spots, in planning, design problems, implementation: the TAR PIT.

TEXT BOOKS:

1. Information systems for modern management, 3rd Edition by R.G Murdick, J.E Ross and J. R clagget, PHI-1994.

2. Management Information Systems, Managing the Digital Firm Edition by Kenneth C. Laudon, Jane P. Laudon, Pearson Education, 10th Edition.

REFERENCE BOOKS:
1. Management information Systems, 4th edition by Robert Schultheis, Mary Sumner, PHI- Seventeenth Reprint 2007.
2   Principles of Information systems, Sixth edition by Ralph M.Stair, George W.Reynolds, Cengage learning.
3   Management Information Systems, J.A.O'brien, G.M.Marakas, R.Behl, 9th Edition, TMH.
4   Management Information Systems, Effy Oz, Cengage Learning.
5   Managing and Using Information Systems, K.E.Pearlson, C.S.Saunders, Wiley India.
6   Management information Systems, M.Jaiswal & M.Mital, Oxford University Press.
7   MIS, Rahul De, First edition, Wiley India.

MCA - II Year - II Sem.

ORGANIZATION STRUCTURE AND PERSONNEL MANAGEMENT
(Core Elective-I)

Objectives:
One of the main objectives of this course is to provide the students with an in depth understanding of organizations. Organizations are a main tool that modern society applies to meet the challenges of innovation and resolution of complex tasks. To understand how to organize to resolve the challenges organizations meet is a main focus of this course. The course reviews the main contributions to organization research.

This is an introductory course in Organization Theory. In this course we will explore the basic theories and principles around which contemporary organizations are structured in complex, dynamic, uncertain, and competitive environments. The course examines the effects of both the internal and external environment on managerial choices for the structuring of organizations, as well as the implications that stem from these choices.

This course also covers Personnel Management and Communication. In this course we will explore the basic theories of Personnel Management and its functions. The object of the study is to do the analysis of various functions of the organization in functional area of Personnel Management so that the student should be in a position to create data bases and programmes in the content of Personnel Department.

Outcomes:
 The course will help each student to better:
- Understand the importance of organizational structure and design on internal organizational processes and overall effectiveness.
- Understand the relationships between organization structure and the behavior of those who work in them or otherwise interact with them.
- Recognize the managerial implications of organization design and change and how these are informed by the relevant theories.
- Appreciate the impact of advanced technologies on the strategy and structure of organizations and how to address the changes implied by the adoption of these technologies.
- Acquire the knowledge and skills needed to analyze the design and structure of organizations through a combination of lectures, discussions, and cases.
- Understand the Personnel Functions like position of the personnel department in the organization.
- Understand manpower planning, job description, interviewing techniques, transfers, promotion and its policies.
- Understand the training and development and career planning and Performance Appraisal.
- Obtain and practice effective written and oral business communications skills.

UNIT I
Classical Theories of organization : Functional approach, classical theories of organization, division of labour, levels of authority, span of control, authority & responsibility, efficiency of management. Behavioral theories of organization, limitations of formal organization, human relation, group behavior, committee and group making, motivation and morale.

UNIT II
Personnel Function: Evaluation, objectives, principles, philosophies and policies, duties & responsibilities of the manager, position of the personnel department in the organization, line and staff relationship & the changing concept of personnel management in India.

UNIT III

Manpower planning : Uses benefits problems and limitations, manpower inventory, manpower forecasting, job description, recruitment, Job specification and job selection, interviewing techniques, transfers, promotion and its policies.

Training and development : Objectives and policies planning, organizing the training department, training manager and his job, on and off the job training, techniques, career planning, objectives of performance appraisal.

UNIT IV

Strategic management: Objectives, importance policies, concept of core competence capability of organizational learning, strategic levels and planning, business level strategy and functional level, PHASES OF PLANNING,SWOT, develop strategies and prepare strategic plan.

UNIT V

Communication : Importance of communication, inter personnel communication barriers of communication, communication in organizations, using communication skills to manage conflicts. Impact of informational technology and fostering effective communication

TEXT BOOKS:
1. L.M.Prasad, Principles and Practice of Management, Sultan Chand & Sons.
2. A.R.Aryasri, Organizational Structure and Personnel Management, TMH, 2009

REFERENCE BOOKS:
1. Hellriegel, Jackson and Slocum, Edition 9, Management-A competency – Based Approach
2. L.M.Prasad, Human Resource Management.

MCA - II Year - II Sem.

INFORMATION SECURITY
(Core Elective-I)

Objectives:

- Explain the objectives of information security.
- Explain the importance and application of each of confidentiality, integrity, authentication and availability.
- Understand various cryptographic algorithms.
- Understand the basic categories of threats to computers and networks.
- Describe public-key cryptosystem.
- Describe the enhancements made to IPv4 by IPSec.
- Understand Intrusions and intrusion detection.
- Discuss the fundamental ideas of public-key cryptography.
- Generate and distribute a PGP key pair and use the PGP package to send an encrypted e-mail message.
- Discuss Web security and Firewalls.

UNIT I
Attacks on Computers and Computer Security: Introduction, The need for security, Security approaches, Principles of security, Types of Security attacks, Security services, Security Mechanisms, A model for Network Security.
Cryptography: Concepts and Techniques: Introduction, plain text and cipher text, substitution techniques, transposition techniques, encryption and decryption, symmetric and asymmetric key cryptography, steganography, key range and key size, possible types of attacks.

UNIT II
Symmetric key Ciphers: Block Cipher principles & Algorithms(DES, AES, Blowfish), Differential and Linear Cryptanalysis, Block cipher modes of operation, Stream ciphers, RC4,Location and placement of encryption function, Key distribution **Asymmetric key Ciphers:** Principles of public key cryptosystems, Algorithms(RSA, Diffie-Hellman,ECC), Key Distribution.

UNIT III
Message Authentication Algorithms and Hash Functions: Authentication requirements, Functions, Message authentication codes, Hash Functions, Secure hash algorithm, Whirlpool, HMAC, CMAC, Digital signatures, knapsack algorithm **Authentication Applications:** Kerberos, X.509 Authentication Service, Public – Key Infrastructure, Biometric Authentication.

UNIT IV
E-Mail Security: Pretty Good Privacy, S/MIME **IP Security:** IP Security overview, IP Security architecture, Authentication Header, Encapsulating security payload, Combining security associations, key management

UNIT V
Web Security: Web security considerations, Secure Socket Layer and Transport Layer Security, Secure electronic transaction **Intruders, Virus and Firewalls:** Intruders, Intrusion detection, password management, Virus and related threats, Countermeasures, Firewall design principles, Types of firewalls
Case Studies on Cryptography and security: Secure Inter-branch Payment Transactions, Cross site Scripting Vulnerability, Virtual Elections.

TEXT BOOKS:
1. Cryptography and Network Security : William Stallings, Pearson Education,4th Edition.
2. Cryptography and Network Security : Atul Kahate, Mc Graw Hill, 2nd Edition.

REFERENCE BOOKS:

1.   Cryptography and Network Security: C K Shyamala, N Harini, Dr T R Padmanabhan, Wiley India, 1st Edition.
2.   Cryptography and Network Security : Forouzan Mukhopadhyay, Mc Graw Hill, 2nd Edition.
3.   Information Security, Principles and Practice: Mark Stamp, Wiley India.
4.   Principles of Computer Security: WM.Arthur Conklin, Greg White, TMH.
5.   Introduction to Network Security: Neal Krawetz, CENGAGE Learning.
6.   Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.

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DISTRIBUTED SYSTEMS
(Core Elective II)

Objectives:

- Understand the need for distributed systems and their applications.
- Understand the concepts of remote procedure calls, remote file systems, distributed agreement, clock synchronization, and security.

UNIT I

Characterization of Distributed Systems-Introduction, Examples of Distributed systems, Resource sharing and web, challenges, System models-Introduction, Architectural and Fundamental models, Networking and Internetworking, Interprocess Communication.

Distributed objects and Remote Invocation-Introduction, Communication between distributed objects, RPC, Events and notifications, Case study-Java RMI.

UNIT II

Operating System Support- Introduction, OS layer, Protection, Processes and Threads, Communication and Invocation, Operating system architecture, Distributed File Systems-Introduction, File Service architecture, case study- SUN network file systems.

Name Services-Introduction, Name Services and the Domain Name System, Case study of the Global Name Service, Case study of the X.500 Directory Service.

UNIT III

Peer to Peer Systems–Introduction, Napster and its legacy, Peer to Peer middleware, Routing overlays, Overlay case studies-Pastry, Tapestry, Application case studies-Squirrel, OceanStore, Time and Global States-Introduction, Clocks, events and Process states, Synchronizing physical clocks, logical time and logical clocks, global states, distributed debugging.

Coordination and Agreement-Introduction, Distributed mutual exclusion, Elections, Multicast communication, consensus and related problems.

UNIT IV

Transactions and Concurrency control-Introduction, Transactions, Nested Transactions, Locks, Optimistic concurrency control, Timestamp ordering, Comparison of methods for concurrency control. Distributed Transactions-Introduction, Flat and Nested Distributed Transactions, Atomic commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication-Introduction, System model and group communication, Fault tolerant services, Transactions with replicated data.

UNIT V

Security-Introduction, Overview of Security techniques, Cryptographic algorithms, Digital signatures, Case studies-Kerberos, TLS, 802.11 Wi-Fi.

Distributed shared memory, Design and Implementation issues, Sequential consistency and Ivy case study, Release consistency and Munin case study, Other consistency models, CORBA case study-Introduction, CORBA RMI, CORBA Services.

TEXT BOOKS:

1. Distributed Systems Concepts and Design, G Coulouris, J Dollimore and T Kindberg, Fourth Edition, Pearson Education.
2. Distributed Systems, S.Ghosh, Chapman& Hall/CRC, Taylor & Francis Group, 2010.

REFERENCE BOOKS:

1. Distributed Computing, S.Mahajan and S.Shah, Oxford University Press.
2. Distributed Operating Systems Concepts and Design, Pradeep K.Sinha, PHI.
3. Advanced Concepts in Operating Systems, M Singhal, N G Shivarathri, TMH.

4.   Reliable Distributed Systems, K.P.Birman, Springer.
5.   Distributed Systems – Principles and Paradigms, A.S. Tanenbaum and M.V. Steen, Pearson Education.
6.   Distributed Operating Systems and Algorithm Analysis, R.Chow, T.Johnson, Pearson.
7.   Distributed Operating Systems, A.S.Tanenbaum, Pearson education.
8.   Distributed Computing, Principles, Algorithms and Systems, Ajay D.Kshemakalyani and Mukesh Singhal, Cambridge, rp 2010.

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SOFTWARE PROCESS AND PROJECT MANAGEMENT
(Core Elective-II)

The main goal of software development projects is to create a software system with a predetermined functionality and quality in a given time frame and with given costs. For achieving this goal, models are required for determining target values and for continuously controlling these values. This course focuses on principles, techniques, methods & tools for model-based management of software projects, assurance of product quality and process adherence (quality assurance), as well as experience-based creation & improvement of models (process management). The goals of the course can be characterized as follows:

1.   Understanding the specific roles within a software organization as related to project and process management.
2.   Understanding the basic infrastructure competences (e.g., process modeling and measurement).
3.   Understanding the basic steps of project planning, project management, quality assurance, and process management and their relationships.

Objectives:
    At the end of the course, the student shall be able to:

1. Describe and determine the purpose and importance of project management from the perspectives of planning, tracking and completion of project.
2. Compare and differentiate organization structures and project structures.
3. Implement a project to manage project schedule, expenses and resources with the application of suitable project management tools.

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

UNIT IV
Work Flows of the process: Software process workflows, Inter trans workflows. Checkpoints of the Process: Major Mile Stones, Minor Milestones, Periodic status assessments. Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Interaction planning process, Pragmatic planning.
Project Organizations and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.
Process Automation: Automation Building Blocks, The Project Environment.

UNIT V
Project Control and Process instrumentation: The server care Metrics, Management indicators, quality indicators, life cycle expectations pragmatic Software Metrics, Metrics automation. Tailoring the Process: Process discriminants, Example.

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 BOOKS:
1. Software Project Management, Walker Royce, Pearson Education.
2. Software Project Management, Bob Hughes & Mike Cotterell, fourth edition, Tata Mc Graw Hill.

REFERENCE BOOKS:
1. Applied Software Project Management, Andrew Stellman & Jennifer Greene,O'Reilly, 2006.
2. Head First PMP, Jennifer Greene & Andrew Stellman, O'Reilly,2007.
3. Software Engineering Project Management, Richard H. Thayer & Edward Yourdon, second edition, Wiley India, 2004.
4. Agile Project Management, Jim Highsmith, Pearson education, 2004.
5. The art of Project management, Scott Berkun, O'Reilly, 2005.
6. Software Project Management in Practice, Pankaj Jalote, Pearson Education, 2002.

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SOFT COMPUTING
(Core Elective-II)

Objectives:
To give students knowledge of soft computing theories fundamentals, ie. Fundamentals of artificial and neural networks, fuzzy sets and fuzzy logic and genetic algorithms.

UNIT I
AI Problems and Search: AI problems, Techniques, Problem Spaces and Search, Heuristic Search Techniques- Generate and Test, Hill Climbing, Best First Search Problem reduction, Constraint Satisfaction and Means End Analysis. Approaches to Knowledge Representation- Using Predicate Logic and Rules.

UNIT II
Artificial Neural Networks: Introduction, Basic models of ANN, important terminologies, Supervised Learning Networks, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network. Associative Memory Networks. Training Algorithms for pattern association, BAM and Hopfield Networks.

UNIT III
Unsupervised Learning Network- Introduction, Fixed Weight Competitive Nets, Maxnet, Hamming Network, Kohonen Self-Organizing Feature Maps, Learning Vector Quantization, Counter Propagation Networks, Adaptive Resonance Theory Networks. Special Networks-Introduction to various networks.

UNIT IV
Introduction to Classical Sets (crisp Sets)and Fuzzy Sets- operations and Fuzzy sets. Classical Relations -and Fuzzy Relations- Cardinality, Operations, Properties and composition. Tolerance and equivalence relations.
Membership functions- Features, Fuzzification, membership value assignments, Defuzzification.

UNIT V
Fuzzy Arithmetic and Fuzzy Measures, Fuzzy Rule Base and Approximate Reasoning Fuzzy Decision making
Fuzzy Logic Control Systems. Genetic Algorithm- Introduction and basic operators and terminology, Applications: Optimization of TSP, Internet Search Technique

TEXT BOOKS:
1   Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007.
2   Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva, Pearson Edition, 2004.

REFERECE BOOKS :
1.   Artificial Intelligence and SoftComputing- Behavioural and Cognitive Modeling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2.   Artificial Intelligence – Elaine Rich and Kevin Knight, TMH, 1991, rp2008.
3.   Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.
4.   A first course in Fuzzy Logic-Hung T Nguyen and Elbert A Walker, CRC. Press Taylor and Francis Group.
5.   Artificial Intelligence and Intelligent Systems, N.P.Padhy, Oxford Univ. Press.

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WEB TECHNOLOGIES LAB

Objectives:
The primary objective of the course is to learn web programming by designing and developing some web based applications.

List of Sample Problems

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. Than 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 colors-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.

Light Transition	Automobile State
Red ---> Yellow	Ready
Yellow ---> Green	Move
Green --> Red	Stopped

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.
7.   Implement the "Hello World!" program using JSP Struts Framework.
8.   Redo the problem 5 using PHP.

Additional Assignment Problems for the WT Lab.:

Write an HTML page including any required Javascript that takes a number from one text field in the range of 0 to 999 and shows it in another text field in words. If the number is out of range, it should show "out of range" and if it is not a number, it should show "not a number" message in the result box.
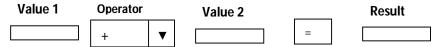
Write a java swing application that takes a text file name as input and counts the characters, words and lines in the file. Words are separated with white space characters and lines are separated with new line character.

Write a simple calculator servlet that takes two numbers and an operator (+, -, /, * and %) from an HTML page and returns the result page with the operation performed on the operands. It should check in a database if the same expression is already computed and if so, just return the value from database. Use MySQL or PostgreSQL.(Do the same problem using PHP).
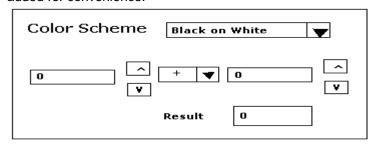
Write an HTML page that contains a list of 5 countries. When the user selects a country, its capital should be printed next to the list. Add CSS to customize the properties of the font of the capital (color, bold and font size).

Write a servlet that takes name and age from an HTML page. If the age is less than 18, it should send a page with "Hello <name>, you are not authorized to visit this site" message, where <name> should be replaced with the entered name. Otherwise it should send "Welcome <name> to this site" message. (Do the same problem using PHP).

Write a calculator program in HTML that performs basic arithmetic operations (+, -, /, * and %). Use CSS to change the foreground and background color of the values, buttons and result display area separately. Validate the input strings using JavaScript regular expressions. Handle any special cases like division with zero reasonably. The screen may look similar to the following:

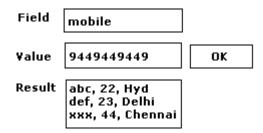| Value 1	Operator	Value 2		Result
	+ ▼		=	

Write a Java program that creates a calculator GUI, as shown in figure. Extra components may be added for convenience:

The Color Scheme may be Black on White or Blue on Yellow (selectable) and accordingly all components colors must be changed. The values can be either entered or increased or decreased by a step of 10. The operators are +, -, / and * (selectable). Once any change takes place, the result must be automatically computed by the program.

Write a Java Application that will read an XML file that contains personal information (Name, Mobile Number, age and place. It reads the information using SAX parser. After reading the information, it shows two input Text Fields in a window, one for tag name and the other for value. Once these two values are given, it should list all the records in the XML file that match the value of the given field in a text area (result box). For example, if the two text boxes are entered with "name" and "ABCD" then it should show all the records for which name is "ABCD"? An Illustration is given below that takes a mobile number and lists all the records that have the same mobile number.

Consider the following web application for implementation:

The user is first served a login page which takes user's name and password. After submitting the details the server checks these values against the data from a database and takes the following decisions.

If name and password matches, serves a welcome page with user's full name.

If name matches and password doesn't match, then serves "password mismatch" page.

If name is not found in the database, serves a registration page, where users full name, present user name (used to login) and password are collected. Implement this application using:

1. Pure JSP
2. Pure Servlets
3. Struts Framework
4. PHP

Implement a simple arithmetic calculator with +, -, /, *, % and = operations using Struts Framework The number of times the calculator is used should be displayed at the bottom (use session variable).

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LINUX PROGRAMMMING LAB

Note: Use Bash for Shell scripts.

1.   Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.

2.   Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

3.   Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.

4.   Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.

5.   Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.

6.   Write a shell script to list all of the directory files in a directory.

7.   Write a shell script to find factorial of a given integer.

8.   Write an awk script to count the number of lines in a file that do not contain vowels.

9.   Write an awk script to find the number of characters, words and lines in a file.

10.   Write a C program that makes a copy of a file using standard I/O and system calls.

11.   Implement in C the following Unix commands using System calls

   a). cat   b) mv

12.   Write a C program to list files in a directory.

13.   Write a C program to emulate the Unix ls –l command.

14.   Write a C program to list for every file in a directory, its inode number and file name.

15.   Write a C program that redirects standard output to a file.Ex: ls > f1.

16.   Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

17.   Write a C program to create a Zombie process.

18.   Write a C program that illustrates how an orphan is created.

19.   Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l | sort

20.   Write C programs that illustrate communication between two unrelated processes using named pipe.

21.   Write a C program in which a parent writes a message to a pipe and the child reads the message.

22.   Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.

23.   Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (22)) and displays them.

24.   Write a C programs to transfer a large amount of data between processes,using

       a) a pipe   b)a FIFO c)a message queue.

25.   Write a C program to allow cooperating processes to lock a resource for exclusive use, using: a)Semaphores   b)flock or lockf system calls.

26.   Write a C program that illustrates suspending and resuming processes using signals.

27.   Write a C program that implements a producer-consumer system with two processes.

                        (using Semaphores).

28.   Write client and server programs(using c) for interaction between server and client processes using Unix Domain sockets.

29.   Write client and server programs(using c) for interaction between server and client processes using Internet Domain sockets.

30.   Write C programs that illustrate two processes communicating using shared memory.

TEXT BOOKS:
1. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education, 2005.
4. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
5. Sed and Awk, O.Dougherty&A.Robbins,2nd edition