

## **Vision of the Institution**

To ignite the minds of the students through academic excellence so as to bring about social transformation and prosperity.

## **Mission of the Institution**

- To expand the frontiers of knowledge through Quality Education.
- To provide valued added Research and Development.
- To embody a spirit of excellence in Teaching, Creativity, Scholarship and Outreach.
- To provide a platform for synergy of Academy, Industry and Community.
- To inculcate high standards of Ethical and Professional Behavior.

## **Vision of IT Department**

To be leaders in Information Technology through excellence in education, research and community outreach.

## **Mission of IT Department**

- To provide quality education in the core principles of Information Technology.
- To enable the students to apply the core concepts to solve real world problems.
- To amplify their potential through research and continuous learning for high quality career.
- To mould them as professionals with ethics and morals.

## **Program Educational Objectives(PEOs)**

**PEO1:** To provide students with a strong foundation in the mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems.

**PEO2:** Graduates will succeed in entry-level engineering positions in IT industry and with government agencies.

**PEO3:** Graduates will succeed in the pursuit of advanced degrees in engineering or other fields and will have skills for, continued independent, lifelong learning to become experts in their profession.

**PEO4:** Empower students with effective teamwork, communication skills, leadership skills, ethical values and high integrity to serve the interests of the society and nation.

## Program Outcomes(POs) of IT Department

### Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

## Program Specific Outcomes (PSOs) of IT Department

1. An ability to demonstrate basic knowledge in databases, programming languages, common business functions and algorithm analysis to design and develop appropriate Information Technology solutions.
2. Ability to organize an IT Infrastructure, manage and monitor resources and secure the data.

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## **DATA BASE MANAGEMENT SYSTEMS**

### **OBJECTIVES**

- To learn the principles of systematically designing and using large scale Database Management Systems for various applications.

**UNIT-I: An Overview of Database Management,** Introduction- What is Database System- What is Database-Why Database- Data Independence- Relation Systems and Others- Summary, **Database system architecture, Introduction-** The Three Levels of Architecture-The External Level- the Conceptual Level- the Internal Level- Mapping- the Database Administrator-The Database Management Systems- Client/Server Architecture.

### **UNIT-II:**

The E/R Models, The Relational Model, Relational Calculus, Introduction to Database Design, Database Design and Er Diagrams-Entities Attributes, and Entity Sets-Relationship and Relationship Sets-Conceptual Design With the Er Models, The Relational Model Integrity Constraints Over Relations- Key Constraints –Foreign Key Constraints-General Constraints, Relational Algebra and Calculus, Relational Algebra- Selection and Projection- Set Operation, Renaming – Joins- Division- More Examples of Queries, Relational Calculus, Tuple Relational Calculus- Domain Relational Calculus.

### **UNIT-III:**

**Queries, Constraints, Triggers:** The Form of Basic SQL Query, Union, Intersect, and Except, Nested Queries, Aggregate Operators, Null Values, Complex Integrity Constraints in SQL, Triggers and Active Database.

### **UNIT-IV:**

**Schema Refinement (Normalization) :** Purpose of Normalization or schema refinement, concept of functional dependency, normal forms based on functional dependency(1NF, 2NF and 3 NF), concept of surrogate key, Boyce-codd normal form(BCNF), Lossless join and dependency preserving decomposition, Fourth normal form(4NF).

## **UNIT-V:**

### **Transaction Management and Concurrency Control:**

Transaction, properties of transactions, transaction log, and transaction management with SQL using commit rollback and savepoint.

Concurrency control for lost updates, uncommitted data, inconsistent retrievals and the Scheduler. Concurrency control with locking methods : lock granularity, lock types, two phase locking for ensuring serializability, deadlocks, Concurrency control with time stamp ordering : Wait/Die and Wound/Wait Schemes, Database Recovery management : Transaction recovery.

## **UNIT-VI:**

Overview of Storages and Indexing, Data on External Storage- File Organization and Indexing – Clustered Indexing – Primary and Secondary Indexes, Index Data Structures, Hash-Based Indexing – Tree-Based Indexing, Comparison of File Organization

## **OUTCOMES**

- Describe a relational database and object-oriented database.
- Create, maintain and manipulate a relational database using SQL
- Describe ER model and normalization for database design.
- Examine issues in data storage and query processing and can formulate appropriate solutions.
- Understand the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage.
- Design and build database system for a given real world problem

## **TEXT BOOKS:**

### **1. Introduction to Database Systems, CJ Date, Pearson**

2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw Hill 3rd Edition

3. Database Systems - The Complete Book, H G Molina, J D Ullman, J Widom Pearson

## **REFERENCES BOOKS:**

1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.

2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education

3. Introduction to Database Systems, C.J.Date Pearson Education

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## **HUMAN COMPUTER INTERACTION**

### **OBJECTIVES:**

- Demonstrate an understanding of guidelines, principles, and theories influencing human Computer interaction.
- Recognize how a computer system may be modified to include human diversity.
- Select an effective style for a specific application.
- Design mock ups and carry out user and expert evaluation of interfaces.
- Carry out the steps of experimental design, usability and experimental testing, and evaluation of human computer interaction systems.
- Use the information sources available, and be aware of the methodologies and technologies supporting advances in HCI.

### **UNIT-I:**

The User Interface: Introduction, Importance of the User Interface, Importance and benefits of Good Design History of Human Computer Interface. Characteristics of Graphical and Web User Interface: Graphical User Interface, popularity of graphics, concepts of Direct Manipulation, Graphical System advantage and disadvantage, Characteristics of GUI. Web User Interface, popularity of web, Characteristics of Web Interface, Merging of Graphical Business systems & the Web, Principles of User Interface Design

### **UNIT-II:**

The User Interface Design Process: Obstacles and Pitfall in the development Process, Usability, The Design Team, Human Interaction with Computers, Important Human Characteristics in Design, Human Consideration in Design, Human Interaction Speeds, Performance versus Preference, Methods for Gaining and Understanding of Users

### **UNIT-III:**

Understanding Business Functions: Business Definitions & Requirement analysis, Determining Business Functions, Design standards or Style Guides, System Training and Documentation

**UNIT-IV:**

Principles of Good Screen Design: Human considerations in screen Design, interface design goals, test for a good design, screen meaning and purpose, Technological considerations in Interface Design System Menus and Navigation Schemes: Structure, Functions, Context, Formatting, Phrasing and Selecting, Navigating of Menus, Kinds of Graphical Menus Windows Interface: Windows characteristic, Components of Window, Windows Presentation Styles, Types of Windows, Window Management, Web systems

**UNIT-V:**

Device and Screen-Based Control: Device based controls, Operable Controls, Text entry/read-Only Controls, Section Controls, Combining Entry/Selection Controls, Other Operable Controls and Presentation Controls, Selecting proper controls

**UNIT-VI:**

Effective Feedback Guidance and Assistance: Providing the Proper Feedback, Guidance and Assistance Effective Internationalization and Accessibility- International consideration, Accessibility, Create meaningful Graphics, Icons and Images, Colors-uses, possible problems with colors, choosing colors

**OUTCOMES:**

- Students are assessed on their ability to communicate and apply UCD methods in the capstone project course. Assessment includes examination of team reports and how HCI students can discuss challenges and solutions for adapting UCD methods to fit the practical needs of an actual project

**TEXT BOOKS:**

1. Wilbert O. Galitz, "The Essential Guide to User Interface Design", Wiley India Edition
2. Prece, Rogers, "Sharps Interaction Design", Wiley India.
3. Ben Shneidermann, "Designing the user interfaces". 3rd Edition, Pearson Education Asia.

**REFERENCES BOOKS:**

1. Soren Lauesen, "User Interface Design" , Pearson Education
2. Alan Cooper, Robert Riemann, David Cronin, "Essentials of Interaction Design", Wiley
3. Alan Dix, Janet Finca, GreGoryd, Abowd, Russell, Bealg, "HumanComputer Interaction", Pearson Education.

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## OPERATING SYSTEMS

### OBJECTIVES:

- Study the basic concepts and functions of operating systems.
- Understand the structure and functions of OS.
- Learn about Processes, Threads and Scheduling algorithms.
- Understand the principles of concurrency and Deadlocks.
- Learn various memory management schemes.
- Study I/O management and File systems.
- Learn the basics of Linux system and perform administrative tasks on Linux Servers.

### UNIT I

**Introduction to Operating System Concept:** Types of operating systems, operating systems concepts, operating systems services, Introduction to System call, System call types.

### UNIT-II:

**Process Management** – Process concept, The process, Process State Diagram , Process control block, Process Scheduling- Scheduling Queues, Schedulers, Operations on Processes, Interprocess Communication, Threading Issues, Scheduling-Basic Concepts, Scheduling Criteria, Scheduling Algorithms.

### UNIT-III:

**Memory Management:** Swapping, Contiguous Memory Allocation, Paging, structure of the Page Table, Segmentation

**Virtual Memory Management:**

Virtual Memory, Demand Paging, Page-Replacement Algorithms, Thrashing

### UNIT-IV:

**Concurrency:** Process Synchronization, The Critical- Section Problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples

**Principles of deadlock** – System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery form Deadlock

#### **UNIT-V:**

**File system Interface-** the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

**File System implementation-** File system structure, allocation methods, free-space management  
**Mass-storage structure** overview of Mass-storage structure, Disk scheduling, Device drivers,

#### **UNIT VI:**

**Linux System:** Components of LINUX, Interprocess Communication, Synchronization, Interrupt, Exception and System Call.

**Android Software Platform:** Android Architecture, Operating System Services, Android Runtime Application Development, Application Structure, Application Process management

#### **OUTCOMES:**

- Design various Scheduling algorithms.
- Apply the principles of concurrency.
- Design deadlock, prevention and avoidance algorithms.
- Compare and contrast various memory management schemes.
- Design and Implement a prototype file systems.
- Perform administrative tasks on Linux Servers
- Introduction to Android Operating System Internals

#### **TEXT BOOK:**

1. Operating System Concepts, Abraham Silberschatz, Peter Baer Galvin and Greg Gagne 9th Edition, John Wiley and Sons Inc., 2012.
2. Operating Systems – Internals and Design Principles, William Stallings, 7th Edition, Prentice Hall, 2011.
3. Operating Systems-S Halder, Alex A Aravind Pearson Education Second Edition 2016 .

#### **REFERENCES:**

1. Modern Operating Systems, Andrew S. Tanenbaum, Second Edition, Addison Wesley, 2001.
2. Operating Systems: A Design-Oriented Approach, Charles Crowley, Tata Mc Graw Hill Education”, 1996.
3. Operating Systems: A Concept-Based Approach, D M Dhamdhere, Second Edition, Tata Mc Graw-Hill Education, 2007.



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## PROFESSIONAL ETHICS AND HUMAN VALUES

### Course Objectives:

**\*To give basic insights and inputs to the student to inculcate Human values to grow as a responsible human beings with proper personality.**

**\*Professional Ethics instills the student to maintain ethical conduct and discharge their professional duties.**

### UNIT I: Human Values:

Morals, Values and Ethics – Integrity –Trustworthiness - Work Ethics – Service Learning – Civic Virtue – Respect for others – Living Peacefully – Caring – Sharing – Honesty –Courage – Value Time – Co-operation – Commitment – Empathy – Self-confidence – Spirituality-Character.

### UNIT: II: Principles for Harmony:

Truthfulness – Customs and Traditions -Value Education – Human Dignity – Human Rights – Fundamental Duties - Aspirations and Harmony (I, We & Nature) – Gender Bias - Emotional Intelligence – Salovey – Mayer Model – Emotional Competencies – Conscientiousness.

### UNIT III: Engineering Ethics and Social Experimentation:

History of Ethics - Need of Engineering Ethics - Senses of Engineering Ethics- Profession and Professionalism —Self Interest - Moral Autonomy – Utilitarianism – Virtue Theory - Uses of Ethical Theories - Deontology- Types of Inquiry –Kohlberg’s Theory - Gilligan’s Argument – Heinz’s Dilemma - Comparison with Standard Experiments — Learning from the Past – Engineers as Managers – Consultants and Leaders – Balanced Outlook on Law - Role of Codes – Codes and Experimental Nature of Engineering.

### UNIT IV: Engineers’ Responsibilities towards Safety and Risk:

Concept of Safety - Safety and Risk – Types of Risks – Voluntary v/sInvoluntary Risk – Consequences - Risk Assessment – Accountability – Liability - Reversible Effects - Threshold Levels of Risk - Delayed v/sImmediate Risk - Safety and the Engineer – Designing for Safety – Risk-Benefit Analysis-Accidents.

## **UNIT V: Engineers' Duties and Rights:**

Concept of Duty - Professional Duties – Collegiality - Techniques for Achieving Collegiality – Senses of Loyalty - Consensus and Controversy - Professional and Individual Rights – Confidential and Proprietary Information - Conflict of Interest-Ethical egoism - Collective Bargaining – Confidentiality - Gifts and Bribes - Problem solving-Occupational Crimes-Industrial Espionage- Price Fixing-Whistle Blowing.

## **UNIT VI: Global Issues:**

Globalization and MNCs –Cross Culture Issues - Business Ethics – Media Ethics - Environmental Ethics – Endangering Lives - Bio Ethics - Computer Ethics - War Ethics – Research Ethics -Intellectual Property Rights.

- Related Cases Shall be dealt where ever necessary.

### **Outcome:**

**\*It gives a comprehensive understanding of a variety issues that are encountered by every professional in discharging professional duties.**

**\*It provides the student the sensitivity and global outlook in the contemporary world to fulfill the professional obligations effectively.**

### **References:**

1. Professional Ethics by R. Subramaniam – Oxford Publications, New Delhi.
2. Ethics in Engineering by Mike W. Martin and Roland Schinzinger - Tata McGraw-Hill – 2003.
3. Professional Ethics and Morals by Prof.A.R.Aryasri, DharanikotaSuyodhana - Maruthi Publications.
4. Engineering Ethics by Harris, Pritchard and Rabins, Cengage Learning, New Delhi.
5. Human Values & Professional Ethics by S. B. Gogate, Vikas Publishing House Pvt. Ltd., Noida.
6. Engineering Ethics & Human Values by M.Govindarajan, S.Natarajan and V.S.SenthilKumar-PHI Learning Pvt. Ltd – 2009.
7. Professional Ethics and Human Values by A. Alavudeen, R.Kalil Rahman and M. Jayakumaran – University Science Press.
8. Professional Ethics and Human Values by Prof.D.R.Kiran-Tata McGraw-Hill - 2013
9. Human Values And Professional Ethics by Jayshree Suresh and B. S. Raghavan, S.Chand Publications

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## **UNIX AND SHELL PROGRAMMING**

### **OBJECTIVES:**

- Written technical communication and effective use of concepts and terminology.
- Facility with UNIX command syntax and semantics.
- Ability to read and understand specifications, scripts and programs.
- Individual capability in problem solving using the tools presented within the class.  
Students will demonstrate a mastery of the course materials and concepts within in class discussions.

### **UNIT-I**

Introduction to unix-Brief History-What is Unix-Unix Components-Using Unix-Commands in Unix-Some Basic Commands-Command Substitution-Giving Multiple Commands.

### **UNIT-II**

The File system –The Basics of Files-What’s in a File-Directories and File Names-Permissions-I Nodes-The Directory Hierarchy, File Attributes and Permissions-The File Command knowing the File Type-The Chmod Command Changing File Permissions-The Chown Command Changing the Owner of a File-The Chgrp Command Changing the Group of a File.

### **UNIT-III**

Using the Shell-Command Line Structure-Met characters-Creating New Commands-Command Arguments and Parameters-Program Output as Arguments-Shell Variables- -More on I/O Redirection-Looping in Shell Programs.

### **UNIT-IV**

Filters-The Grep Family-Other Filters-The Stream Editor Sed-The AWK Pattern Scanning and processing Language-Good Files and Good Filters.

### **UNIT-V**

Shell Programming-Shell Variables-The Export Command-The Profile File a Script Run During Starting-The First Shell Script-The read Command-Positional parameters-The \$? Variable knowing the exit Status-More about the Set Command-The Exit Command-Branching Control Structures-Loop Control Structures-The Continue and Break Statement-The Expr Command: Performing Integer Arithmetic-Real Arithmetic in Shell Programs-The here Document(<<)-The Sleep Command-Debugging Scripts-The Script Command-The Eval Command-The Exec Command.

## **UNIT-VI**

The Process-The Meaning-Parent and Child Processes-Types of Processes-More about Foreground and Background processes-Internal and External Commands-Process Creation-The Trap Command-The Stty Command-The Kill Command-Job Control.

### **OUTCOMES:**

- Documentation will demonstrate good organization and readability.
- File processing projects will require data organization, problem solving and research.
- Scripts and programs will demonstrate simple effective user interfaces.
- Scripts and programs will demonstrate effective use of structured programming.
- Scripts and programs will be accompanied by printed output demonstrating completion of a test plan.
- Testing will demonstrate both black and glass box testing strategies.
- Project work will involve group participation.

### **TEXT BOOKS:**

1. The Unix programming Environment by Brian W. Kernighan & Rob Pike, Pearson.
2. Introduction to Unix Shell Programming by M.G.Venkateshmurthy, Pearson.

### **REFERENCE BOOKS:**

Unix and shell programming by B.M. Harwani, OXFORD university press.

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## **ADVANCED JAVA PROGRAMMING**

### **OBJECTIVES:**

- Getting the student to be well trained in Advanced Java Programming skills for an easy entry in the IT Industry.

### **UNIT –I:**

Recapitulation of XHTML, XHTML5, Java Swing package – use of System class – Applet Context – signed applet – object serialization- shallow and deep copying – Java collections –Iterators – Array Lists – sets –hashset-hash table- queue- priority queue class-vector class- comparable interface.

### **UNIT – II:**

Java Beans Introduction to Java Beans, Advantages of Java Beans, JDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizers, Java Beans API

### **UNIT - III:**

Introduction to Servlets: Lifecycle of a Servlet, JDK 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, servlet chaining-Security Issues.

### **UNIT -IV:**

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 - V:**

JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data

Between JSP pages, Requests, and Users Passing Control and Data between Pages – Sharing Session and Application Data – Memory Usage Considerations

#### **UNIT - VI:**

Database Access Database Programming using JDBC Studying Javax.sql. package. Accessing MySql database- Accessing MS Access database- Accessing a Database from a JSP Page Application – Specific Database Actions Deploying JAVA Beans in a JSP Page. Introduction to struts framework.

#### **OUTCOMES:**

- Construct a Web Application using Servlets
- Construct a Web application using Java Server Pages
- Construct an enterprise application using Session Beans
- Construct an enterprise application using Entity Beans linked with Database
- Construct an asynchronous enterprise application using Message-Driven Beans

#### **TEXT BOOKS:**

1. Internet and World wide web- How to program , Dietel and Nieto , Pearson. (Chapters: 3, 4, 8, 9, 10, 11, 12 to 18)
2. The Complete Reference, Java 2 , 3ed, Patrik Naughton, Herbert Schildt, TMH. (Chapters: 19, 20, 21, 22, 25, 27)
3. Java Server Pages , Hans Bergstan, Oreilly ( Chapters: 1-9)

#### **REFERENCE BOOKS:**

1. Jakarta Struts cook book, Bill Siggelkow, SPD, Oreilly ( Chapter 8)
2. Murach's, Beginning Java JDK5, Murach, SPD.
3. An introduction to Web Design and Programming, Wang Thomson
4. Web application technologies concepts, Knuckles, John Wiley.
5. Programming world wide web, Sebesta, Pearson
6. Building Web Applications, NIIT, PHI
7. Web Warrior Guide to Web Programing, Bai, Ekedaw, Thomas, Wiley
8. Beginning Web Programming, Jon Duckett ,Wrox, Wiley
9. Java server pages, Pekowsky, Pearson

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### **ADVANCED JAVA PROGRAMING LAB**

#### **OBJECTIVES:**

- To develop skills in students in developing applications using advanced concepts of advanced Java programming concepts like JDBC, Servlets, JSP, Java Beans, etc.

#### **PROGRAMS LIST:**

1. Write a program to prompt the user for a hostname and then looks up the IP address for the hostname and displays the results.
2. Write a program to read the webpage from a website and display the contents of the webpage.
3. Write programs for TCP server and Client interaction as per given below.
  - i). A program to create TCP server to send a message to client.
  - ii). A program to create TCP client to receive the message sent by the server.
4. Write programs for Datagram server and Client interaction as per given below.
  - i). A program to create Datagram server to send a message to client.
  - ii). A program to create Datagram client to receive the message sent by the server
5. Write a program by using JDBC to execute a SQL query for a database and display the results.
6. Write a program by using JDBC to execute an update query without using Prepared Statement and display the results.
7. Write a program by using JDBC to execute an update query by using Prepared Statement and display the results.
8. Write a program to execute a stored procedure in the database by using Callable Statement and display the results.
9. Write a program to display a greeting message in the browser by using Http Servlet.

10. Write a program to receive two numbers from a HTML form and display their sum in the browser by using Http Servlet.
11. Write a program to display a list of five websites in a HTML form and visit to the selected website by using Response redirection.
12. Write a program to store the user information into Cookies. Write another program to display the above stored information by retrieving from Cookies.
13. Write a program in Java Beans to add a Button to the Bean and display the number of times the button has been clicked.
14. Write a program for Java Bean with Simple property by using SimpleBeanInfo class.
15. Write a program for Java Bean with Indexed Property by using SimpleBeanInfo class.
16. Write a program to develop a Enterprise Java Bean of "Session Bean" type.

**OUTCOMES:**

- After successful completion of course, students will be able appreciate and apply the advanced concepts of Java including JDBC, Servlets, JSP, Java Beans, etc.



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## UNIX AND OPERATING SYSTEMS LAB

### OBJECTIVES:

- To understand the design aspects of operating system.
- To study the process management concepts & Techniques.
- To study the storage management concepts.
- To familiarize students with the Linux environment
- To learn the fundamentals of shell scripting/programming
- To familiarize students with basic Unix administration

### Operating Systems

1. Simulate the following CPU scheduling algorithms  
a) Round Robin b) SJF c) FCFS d) Priority
2. Multiprogramming-Memory management- Implementation of fork (), wait (), exec() and exit (), System calls
3. Simulate the following  
a) Multiprogramming with a fixed number of tasks (MFT)  
b) Multiprogramming with a variable number of tasks (MVT)
4. Simulate Bankers Algorithm for Dead Lock Avoidance
5. Simulate Bankers Algorithm for Dead Lock Prevention.
6. Simulate the following page replacement algorithms.  
a) FIFO b) LRU c) LFU
7. Simulate the following File allocation strategies  
a) Sequenced b) Indexed c) Linked

### UNIX Programming

List of Experiments:

1. Basic Shell Commands Shell Programs:
2. Fibonacci Series
3. Designing Calculator
4. File Operations
5. Base conversion
6. Usage of cut and grep commands
7. Usage of user defined functions Administration
8. Managing User Accounts
9. User Quota Management
10. Installation of RPM software and Zipping, tar
11. Configuring RAID
12. Configuring Web server

**OUTCOMES:**

- To use Unix utilities and perform basic shell control of the utilities
- To use the Unix file system and file access control.
- To use of an operating system to develop software
- Work confidently in Unix/Linux environment
- Write shell scripts to automate various tasks
- Master the basics of Linux administration

## **DATA BASE MANAGEMENT SYSTEM LAB**

### **OBJECTIVES:**

- To provide a sound introduction to the discipline of database management as a subject in its own right, rather than as a compendium of techniques and product-specific tools.
- To familiarize the participant with the nuances of database environments towards an information-oriented data-processing oriented framework
- To give a good formal foundation on the relational model of data
- To present SQL and procedural interfaces to SQL comprehensively
- To give an introduction to systematic database design approaches covering conceptual design, logical design and an overview of physical design

### **List of Experiments:**

#### **SQL**

1. Queries to facilitate acquaintance of Built-In Functions, String Functions, Numeric Functions, Date Functions and Conversion Functions.
2. Queries using operators in SQL
3. Queries to Retrieve and Change Data: Select, Insert, Delete, and Update
4. Queries using Group By, Order By, and Having Clauses
5. Queries on Controlling Data: Commit, Rollback, and Save point
6. Queries to Build Report in SQL \*PLUS
7. Queries for Creating, Dropping, and Altering Tables, Views, and Constraints
8. Queries on Joins and Correlated Sub-Queries
9. Queries on Working with Index, Sequence, Synonym, Controlling Access, and Locking Rows for Update, Creating Password and Security features

## **PL/SQL**

10. Write a PL/SQL Code using Basic Variable, Anchored Declarations, and Usage of Assignment Operation
11. Write a PL/SQL Code Bind and Substitution Variables. Printing in PL/SQL
12. Write a PL/SQL block using SQL and Control Structures in PL/SQL
13. Write a PL/SQL Code using Cursors, Exceptions and Composite Data Types
14. Write a PL/SQL Code using Procedures, Functions, and Packages FORMS
15. Write a PL/SQL Code Creation of forms for any Information System such as Student Information System, Employee Information System etc. 18
16. Demonstration of database connectivity

### **OUTCOMES:**

- Understand, appreciate and effectively explain the underlying concepts of database technologies
- Design and implement a database schema for a given problem-domain
- Normalize a database
- Populate and query a database using SQL DML/DDI commands.
- Declare and enforce integrity constraints on a database using a state-of-the-artRDBMS
- Programming PL/SQL including stored procedures, stored functions, cursors, packages.
- Design and build a GUI application using a 4GL

**Note:** The creation of sample database for the purpose of the experiments is expected to be predecided by the instructor.

### **Text Books/Suggested Reading:**

1. Oracle: The Complete Reference by Oracle Press
2. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007.
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