|  |  |  |
| --- | --- | --- |
| **ITX 321** | **COMPUTER COMMUNICATION AND NETWORKS LAB** | **1 Credits [0-0-2]** |

**Objectives:**

* In this lab students acquire skills of computer networking. They develop programs related to network programming and network communication.

**LIST OF PRACTICALS**

1. Introduction to Network Simulator OPNET/NS2.
2. Evaluate Ethernet Delay and Load Statics of Switched Ethernet
3. Comparative investigation on Hub and Switch as Interconnecting Device for verifying performance of LAN with various applications
4. Evaluate the comparative investigations on the performance issues of switched Ethernet with VLAN based on Email and FTP applications.
5. Evaluate Internet connection choice for PC Network on different Data Rate for WAN based on Web Browsing and Email application
6. Implementation of CSMA/CD Protocol and its comparative investigation with ALOHA Protocol.
7. Design and Implementation of Simple Transfer Protocol in C/ C++.
8. Simulation of Pure Aloha.
9. Simulation of Slotted Aloha.
10. Design of ARP Protocol.
11. Design of ICMP Protocol.
12. Design of RIP Protocol.
13. Design of OSPF Protocol.
14. Design TCP Client and Server application to transfer a file.
15. Design UDP Client and Server application to transfer a file.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

|  |  |  |
| --- | --- | --- |
| **ITX 323** | **OPERATING SYSTEM CONCEPTS LAB** | **1 Credits [0-0-2]** |

**Objectives:**

* To provide an understanding of the design aspects of operating systems.

**LIST OF PRACTICALS**

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher’s Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques a) Single Level Directory b) Two Level c) Hierarchical d) DAG
9. To automate the allocation of IP addresses i.e. to set and configure the DHCP server and DHCP client.
10. To share files and directories between RedHat Linux operating systems i.e. To set and configure the NFS server and NFS clients.
11. To share files and directories between Red Hat Linux and Windows operating systems i.e. To set and configure the samba server.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

|  |  |  |
| --- | --- | --- |
| **ITX 325** | **DATA MINING AND DATAWAREHOUSING CONCEPTS LAB** | **2 Credits [0-0-4]** |

**Objectives:**

* To understand the need of Data Mining and advantages to the business and scientific world.

**LIST OF PRACTICALS**

Students are required to perform practical’s in Oracle/MS SQL Server and *STATISTICA Data Miner*

1. Building a Database Design using ER Modeling and Normalization Techniques
2. Implementation of functions ,Procedures, Triggers and Cursors
3. Load Data from heterogeneous sources including text files into a predefined warehouse schema.
4. Design a data mart for a bank to store the credit history of customers in a bank. Use this credit profiling to process future loan applications.
5. Perform feature Selection and Variable Filtering (for very large data sets)
6. Perform association Mining in large data sets using FP, Apriori and ECLAT algorithm
7. Execute various data cluster operations like Drill-Down, Roll up, Slice and Dice operations
8. Study of generalized EM & *k*-Means Cluster Analysis.
9. Study of generalized Additive Models (GAM)
10. Implement decision tree algorithm like ID3, CART, and HUNT.
11. Study of general CHAID (Chi-square Automatic Interaction Detection) Models
12. To perform “Goodness of Fit” Computations using various techniques.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course*

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING**

**COURSE CODE: CSX-421**

**COURSE TITLE: WIRELESS NETWORKS LABORATORY**

**COURSE DESIGNATION: REQUIRED**

**PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:**  Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:** Upon successful completion of course, students will

* Learn to model radio signal propagation issues and analyze their impact on communication system performance
* Understand how the various signal processing and coding techniques combat channel uncertainties
* Understand the techniques of radio spectrum allocation in multi-user systems and their impact on networks capacity
* Learn to simulate wireless networks and analyze the simulation results

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Outcomes** | **Program outcomes** | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-421** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 | H | M | M |  |  |  |  |  |  |  |  |  |
| CO 2 |  | M |  | H |  |  |  | H |  |  |  |  |
| CO 3 |  |  | H | M | H |  |  |  |  |  |  |  |
| CO 4 |  | H |  |  | M | H | H |  | H |  | H |  |

**TOPICS COVERED**

1. Design an 802.11 network of mesh topology, using set of suitable inputs check the performance parameters like: Battery Energy consumed, Bit error Rate, Busy, Signal to Noise ratio, Throughput, Utilization.
2. Design Wireless network using Carrier Sensing Multiple Access Technique, Check the performance parameters like: Channel Throughput, Signal to Noise Ratio etc.
3. Design a Project having two scenarios: (a) Star Topology Wireless Network using rapid configuration method. (b) Ring Topology Wireless network also using rapid configuration method, Compare the performance parameters like: End to End Delay for data, Traffic Received, Queue size etc.
4. Design a Star shaped Wireless network, and suggest a way to configure a Physical layer of selected nodes.
5. Design a Project having two scenarios: (a) Bus Topology Wireless Network (b) Ring Topology Wireless network, make use of the Web Reporting to compare the result of two different scenarios.
6. Design a Wireless model having four networks which are ten meters apart from each other, connected to each other wirelessly and are susceptible to delays etc.
7. Create a radio network and observe variations in the quality of received signal that results from radio noise at the receiving node in a dynamic network topology.
8. Designs a Star shaped Wireless topology and suggest a suitable way to import traffic.
9. Performance analysis of wireless mesh backhaul network with 802.11 a/b/g technologies using OPNET.
10. Performance analysis of wireless mesh backhaul network with 802.11 a/p technologies using OPNET.
11. Development of a new CDMA based MAC on top of 802.11p Physical layer

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING**

**COURSE CODE: CSX-425**

**COURSE TITLE: DATA MINING AND DATA WAREHOUSING LAB**

**COURSE DESIGNATION: REQUIRED**

**PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:**  Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:** After undergoing the course students will be able to:

* Synthesize the data mining fundamental concepts and techniques from multiple perspectives.
* Develop skills and apply data mining tools for solving practical problems
* Develop research skills by reading the data mining literature and develop advance relevant programming skills

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Outcomes** | **Program outcomes** | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-425** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 | H | M |  |  |  | H | H | M |  |  |  |  |
| CO 2 | L | H | H | H | H |  |  |  | H |  |  |  |
| CO 3 |  |  |  | H |  | H | H | H | H | H | H | H |

**TOPICS COVERED**

Students are required to perform practical’s in Oracle/MS SQL Server and *STATISTICA Data Miner*

1. Building a Database Design using ER Modeling and Normalization Techniques
2. Implementation of functions ,Procedures, Triggers and Cursors
3. Load Data from heterogenous sources including text files into a predefined warehouse schema.
4. Design a data mart for a bank to store the credit history of customers in a bank .Use this credit profiling to process future loan applications.
5. [Feature Selection and Variable Filtering (for very large data sets)](http://www.statsoft.co.uk/dataminer.html#feature)
6. [Association Mining](http://www.statsoft.co.uk/dataminer.html#assrul) in large data sets
7. [Interactive Drill-Down, Roll up, Slice and Dice operations](http://www.statsoft.co.uk/dataminer.html#ddexplore)
8. [Generalized EM &*k*-Means Cluster Analysis](http://www.statsoft.co.uk/dataminer.html#em)
9. [Generalized Additive Models (GAM)](http://www.statsoft.co.uk/dataminer.html#gam)
10. [General Classification and Regression Trees (GTrees)](http://www.statsoft.co.uk/dataminer.html#gtrees)
11. [General CHAID (Chi-square Automatic Interaction Detection) Models](http://www.statsoft.co.uk/dataminer.html#chaid)
12. [Interactive Classification and Regression Trees](http://www.statsoft.co.uk/dataminer.html#interactive)
13. [Goodness of Fit Computations](http://www.statsoft.co.uk/dataminer.html#gfit)

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING**

**COURSE CODE: CSX-227**

**COURSE TITLE: OBJECT ORIENTED PROGRAMMING LABORATORY**

**COURSE DESIGNATION: REQUIRED  
PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-1-2)**

**COURSE ASSESSMENT METHODS:**  Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment.

**COURSE OUTCOMES:**

After the completion of the course, the students will be able to:

* Gain understanding about the object oriented principles in construction of robust and maintainable programs.
* Have a competence to design , write, compile, test and execute programs using high level language.
* Have an awareness of the need for a professional approach to design and the importance of good documentation to finish.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program outcomes | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-227** |  |  |  |  |  |  |  |  |  |  |  |  |
|  | H |  | M | M |  |  |  |  |  |  |  |  |
|  | L | H | H | M |  |  |  |  |  |  |  |  |
|  |  |  |  | H |  | M |  | H | M | H |  | M |

**TOPICS COVERED**

1. Write a program to read a matrix of size m x n form the keyboard and display the same using function.
2. Program to make the use of inline function.
3. Write a function power () which raise a number m to a power n. The function takes double value of m and integer value of n and returns the result. Use a default value of n is 2 to make the function to calculate squares when this argument is omitted.
4. Program to show that the effect of default arguments can be alternatively achieved by overloading.
5. Write a class ACCOUNT that represents your bank account and then use it.

The class should allow you to deposit money, withdraw money, calculate interest,

send you a message if you have insufficient balance.

1. Write a class STRING that can be used to store strings, add strings, equate string,

output strings.

1. Create the class TIME to store time in hours and minutes. Write a friend function to add two TIME objects.
2. Create two classes DM and DB. DM stores the distance in meter and centimeters and DB stores the distance in feet and inches. Write a program two add object of DM with the object of DB class.
3. Write a program to create an abstract class named Shape that contains an empty method named number Of Sides ( ).Provide three classes named Trapezoid, Triangle and Hexagon such that each one of the classes inherits the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.
4. Program to demonstrate the concept of:
   1. Default constructor
   2. Parameterized constructor
   3. Copy constructor
   4. Constructor overloading
5. Program to demonstrate the concept of destructor.
6. Program to show multiple inheritance
7. Program to show multilevel inheritance
8. Program to show hybrid inheritance
9. Program to show the concept of containership.
10. Program to overload unary operator.
11. Program to overload binary operator
12. Program to show the concept of run time polymorphism using virtual function.
13. Program to work with formatted and unformatted IO operations.
14. Program to read the name and roll numbers of students from keyboard and write them into a file and then display it.
15. Program to copy one file onto the end of another, adding line numbers
16. Write a function template for finding the minimum value contained in an array.
17. Write a class template to represent generic vector (a series of float values). Include member function to perform following tasks.
    1. Create vector
    2. Modify the value of a given element
    3. To multiply by a scalar value
    4. To display vector in the form of (10, 20, 30,…………)

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING  
COURSE CODE: CSX-323**

**COURSE TITLE: SOFTWARE ENGINEERING LABORATORY**

**COURSE DESIGNATION: REQUIRED**

**PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:** Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:**

After the course completion, the student learning outcomes include:

* Able to prepare SRS document, design document, test cases and software configuration management and risk management related document.
* Develop function oriented and object oriented software design using tools like rational rose.
* Able to perform unit testing and integration testing.
* Apply various white box and black box testing techniques
* Able to track the progress of a project using Openproj tool

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program outcomes | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-323** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 |  | H |  |  | L |  |  |  |  | H |  | H |
| CO 2 | H |  | H |  | M |  |  |  |  |  |  |  |
| CO 3 |  |  | L | H | M |  |  |  | M |  |  | H |
| CO 4 |  | M | M |  | L |  |  |  |  |  |  |  |
| CO 5 |  |  | M | M | H | H | H | H | H | M | M | H |

**TOPICS COVERED**

System Requirement Specification (SRS) and related analysis documents Design documents representing the complete design of the software system.

Use of CASE Tools

Analysis and design for the same problem should be done using Object-Oriented approach.

Simple exercises in effort and cost estimation in COCOMO model.

Application of COCOMO and Function Point (FP) model for the actual project that has been chosen.

Familiarization of SCM tools with some public domain software .

Familiarization of some reverse engineering tools available in the public domain.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

|  |  |  |
| --- | --- | --- |
| **ITX 321** | **COMPUTER COMMUNICATION AND NETWORKS LAB** | **1 Credits [0-0-2]** |

**Objectives:**

* In this lab students acquire skills of computer networking. They develop programs related to network programming and network communication.

**LIST OF PRACTICALS**

1. Introduction to Network Simulator OPNET/NS2.
2. Evaluate Ethernet Delay and Load Statics of Switched Ethernet
3. Comparative investigation on Hub and Switch as Interconnecting Device for verifying performance of LAN with various applications
4. Evaluate the comparative investigations on the performance issues of switched Ethernet with VLAN based on Email and FTP applications.
5. Evaluate Internet connection choice for PC Network on different Data Rate for WAN based on Web Browsing and Email application
6. Implementation of CSMA/CD Protocol and its comparative investigation with ALOHA Protocol.
7. Design and Implementation of Simple Transfer Protocol in C/ C++.
8. Simulation of Pure Aloha.
9. Simulation of Slotted Aloha.
10. Design of ARP Protocol.
11. Design of ICMP Protocol.
12. Design of RIP Protocol.
13. Design of OSPF Protocol.
14. Design TCP Client and Server application to transfer a file.
15. Design UDP Client and Server application to transfer a file.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

|  |  |  |
| --- | --- | --- |
| **ITX 325** | **DATA MINING AND DATAWAREHOUSING CONCEPTS LAB** | **2 Credits [0-0-4]** |

**Objectives:**

* To understand the need of Data Mining and advantages to the business and scientific world.

**LIST OF PRACTICALS**

Students are required to perform practical’s in Oracle/MS SQL Server and *STATISTICA Data Miner*

1. Building a Database Design using ER Modeling and Normalization Techniques
2. Implementation of functions ,Procedures, Triggers and Cursors
3. Load Data from heterogeneous sources including text files into a predefined warehouse schema.
4. Design a data mart for a bank to store the credit history of customers in a bank. Use this credit profiling to process future loan applications.
5. Perform feature Selection and Variable Filtering (for very large data sets)
6. Perform association Mining in large data sets using FP, Apriori and ECLAT algorithm
7. Execute various data cluster operations like Drill-Down, Roll up, Slice and Dice operations
8. Study of generalized EM & *k*-Means Cluster Analysis.
9. Study of generalized Additive Models (GAM)
10. Implement decision tree algorithm like ID3, CART, and HUNT.
11. Study of general CHAID (Chi-square Automatic Interaction Detection) Models
12. To perform “Goodness of Fit” Computations using various techniques.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING  
COURSE CODE: CSX-325**

**COURSE TITLE: OPERATING SYSTEMS LABORATORY**

**COURSE DESIGNATION: REQUIRED**

**PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:** Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:**

Students can perform:--

After the course completion, the student would be able to:

* Analyse the working of an operating system and its components.
* Define and analyse the synchronization process.
* Identify the working methodology of multithreaded applications.
* Compare and analyse different file systems being used in different operating systems.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program outcomes | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-325** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 | M | H |  | M |  |  |  | M | M |  |  |  |
| CO 2 |  | M | H | L |  |  |  |  |  |  |  |  |
| CO 3 |  | M |  | H | M |  |  |  |  |  |  |  |
| CO 4 |  | M |  | M | H | M | M |  |  |  |  |  |

.

**TOPICS COVERED**

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher’s Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques a) Single Level Directory b) Two Level c) Hierarchical d) DAG
9. To automate the allocation of IP addresses i.e. to set and configure the DHCP server and DHCP client.
10. To share files and directories between RedHat Linux operating systems i.e. To set and configure the NFS server and NFS clients.
11. To share files and directories between Red Hat Linux and Windows operating systems i.e. To set and configure the samba server.
12. To set and configure the DNS (Domain Name Server).
13. To set and configure the print server and to share printers between Windows and Red Hat Linux operating systems.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING  
COURSE CODE: CSX-321**  
**COURSE TITLE: COMPUTER NETWORKS LABORATORY**

**COURSE DESIGNATION: REQUIRED  
PRE-REQUISITES: NONE  
CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:** Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:**

After the course completion, the student learning outcomes include:

* Identify and use various networking components like switches, bridges etc.
* Introduction to the simulation tool NS2.
* Implement any topology using network devices using NS2.
* Implement device sharing on network and cryptographic techniques.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program outcomes | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-321** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 | M | M |  | M | H | L |  |  |  |  |  |  |
| CO 2 | M |  |  |  | H |  |  |  |  |  |  |  |
| CO 3 |  |  | H | H | M |  |  |  |  |  |  |  |
| CO 4 |  |  |  |  | L | H |  |  |  |  |  |  |

**TOPICS COVERED**

* + - 1. Introduction to Network Simulator OPNET/NS2.
      2. Evaluate Ethernet Delay and Load Statics of Switched Ethernet
      3. Comparative investigation on Hub and Switch as Interconnecting Device for verifying performance of LAN with various applications
      4. Evaluate the comparative investigations on the performance issues of switched Ethernet with VLAN based on Email and FTP applications.
      5. Evaluate Internet connection choice for PC Network on different Data Rate for WAN based on Web Browsing and Email application
      6. Implementation of Firewall; in a Network.
      7. Simulation of Wireless data Network with different with physical characteristics.
      8. Implementation of CSMA/CD Protocol and its comparative investigation with ALOHA Protocol.
      9. Design and Implementation of Simple Transfer Protocol in C/ C++.
      10. Design of substitution Cipher in C/ C++.
      11. Design of Transposition Cipher in C/ C++.
      12. Design of Public Key Algorithm in C/ C++.

\* Students are advised to use **OPNET/NS2**for above listed experiments.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*

**DEPARTMENT: COMPUTER SCIENCE AND ENGINEERING  
COURSE CODE: CSX-325**

**COURSE TITLE: OPERATING SYSTEMS LABORATORY**

**COURSE DESIGNATION: REQUIRED**

**PRE-REQUISITES: NONE**

**CONTACT HOURS/CREDIT SCHEME: (L-T-P-C: 0-0-2-1)**

**COURSE ASSESSMENT METHODS:** Assignments for each topic to be evaluated in the lab, and final evaluation at the end which includes Viva Voce, Conduct of experiment. **COURSE OUTCOMES:**

Students can perform:--

After the course completion, the student would be able to:

* Analyse the working of an operating system and its components.
* Define and analyse the synchronization process.
* Identify the working methodology of multithreaded applications.
* Compare and analyse different file systems being used in different operating systems.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Course Outcomes | Program outcomes | | | | | | | | | | | |
|  | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
| **CSX-325** |  |  |  |  |  |  |  |  |  |  |  |  |
| CO 1 | M | H |  | M |  |  |  | M | M |  |  |  |
| CO 2 |  | M | H | L |  |  |  |  |  |  |  |  |
| CO 3 |  | M |  | H | M |  |  |  |  |  |  |  |
| CO 4 |  | M |  | M | H | M | M |  |  |  |  |  |

.

**TOPICS COVERED**

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher’s Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques a) Single Level Directory b) Two Level c) Hierarchical d) DAG
9. To automate the allocation of IP addresses i.e. to set and configure the DHCP server and DHCP client.
10. To share files and directories between RedHat Linux operating systems i.e. To set and configure the NFS server and NFS clients.
11. To share files and directories between Red Hat Linux and Windows operating systems i.e. To set and configure the samba server.
12. To set and configure the DNS (Domain Name Server).
13. To set and configure the print server and to share printers between Windows and Red Hat Linux operating systems.

*This is only the suggested list of Practicals. Instructor may frame additional Practicals relevant to the course contents.*