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MC – Major Core    SE–Subject Elective    ID- Inter disciplinary
SU-Supportive      CP-Common Paper       GE-General Elective
CS1810 - Design and Analysis of Algorithms - MC/5H/4 Cr/TH

Objective:

To introduce the basic Concept of design and analysis of algorithms and to understand the fundamentals of problem solving.

UNIT I INTRODUCTION


UNIT II DIVIDE AND CONQUER METHOD AND GREEDY METHOD


UNIT III DYNAMIC PROGRAMMING


UNIT IV BACKTRACKING AND BRANCH AND BOUND


UNIT V NP-HARD AND NP-COMPLETE PROBLEMS


BOOK FOR STUDY


REFERENCES

Objective:

To develop skills in implementing algorithms through JAVA and to explore the features of Java by applying to solve Data structure problems

1. Apply the Divide and Conquer technique to arrange a set of numbers using merge sort method.
2. Perform Strassen's matrix multiplication using divide and conquer method.
4. Construct a minimum spanning tree using greedy method.
6. Find the solution for traveling salesperson problem using dynamic programming approach.
7. Perform graph traversals.
8. Implement the 8 Queens Problem using backtracking.
10. Find the solution of traveling salesperson problem using branch and bound technique.
Objective:

To introduce basic concepts of computer networks and its applications and to better understand the network architecture and different layers of network.

UNIT I INTRODUCTION


UNIT II NETWORK FUNDAMENTALS


UNIT III NETWORK LAYER


UNIT IV TRANSPORT LAYER

Reliable Byte Stream (TCP) – Simple Demultiplexer (UDP) – TCP Congestion Control – Congestion Avoidance Mechanisms.

UNIT V PRESENTATION LAYER and APPLICATIONS


BOOKS FOR STUDY


REFERENCES


Objective:
To gain knowledge about the methodologies behind the software engineering and testing and to better understand the software development life cycle.

UNIT I: INTRODUCTION

UNIT II: REQUIREMENTS ANALYSIS
Prototyping - Specification - Analysis modeling.

UNIT III: USER INTERFACE DESIGN AND REAL TIME SYSTEMS
Software design - Abstraction - Modularity - Software Architecture - Effective modular design - Cohesion and Coupling - Architectural design and Procedural design - Data flow oriented design.

UNIT IV: SOFTWARE DESIGN

UNIT V: SOFTWARE QUALITY AND TESTING
Software Quality Assurance - Quality metrics - Software Reliability - Software testing - Path testing - Control Structures testing - Black Box testing - Integration, Validation and system testing - Software Maintenance -Reverse Engineering and Re-engineering. CASE tools - projects management, tools - analysis and design tools - programming tools - integration and testing tool - Case studies.

BOOK FOR STUDY:

REFERENCES
Objective:

To gain substantial knowledge about the architecture of computer and to understand the concepts of CPU, Cache, I/O and different processors.

UNIT I: REVIEW OF FUNDAMENTALS

CPU, Memory, I/O Design - Performance evaluation.

UNIT II: CPU ARCHITECTURE

Instruction sets of different machines - CISC Vs RISC - Pipelining issues - Super Scalar Architectures.

UNIT III: MEMORY DESIGN

Virtual memory - Cache design for different architectures and multiprocessor environments - Evaluating Memory Performance.

UNIT IV: I/O DESIGN

Speed limits - Interfacing to different types of I/O devices – Performance measures.

UNIT V: PARALLEL ARCHITECTURES

Data flow - Vector processors - EPIC - Case Studies.

BOOK FOR STUDY:


REFERENCES

CS1815-Advanced Web Design

MC/5H/3 Cr/Pr

Objective:

To impart knowledge about the technologies and their applications and to understand the basics of web designing and to use open source tools.

UNIT I: FUNDAMENTALS


UNIT II: ADVANCE DESIGN ISSUED

Advanced Page design - tables and frames - preparing graphics and animations forms - cascading style sheets - user interface design - page grid - page templates - usability testing.

UNIT III: OPEN SOURCE

MYSQL: Introduction – working with mysql – executing sql commands using mysql

UNIT IV: SCRIPTING IN DESIGN

Typography and Graphic design for the web - Creating transparent GIF - Lean graphics - Image maps – Palette map - Web programming - Web site Garage - W3C HTML validation services - Net mechanic - DHTML - XML.

UNIT V: TOOLS AND APPLICATIONS

Online Applications - Developing an on-line shopping application - Data Base design issues - connecting Data Base with tools such as Java, ASP, Cold Fusion- Designing Portals and Vortals.

BOOK FOR STUDY:


References:


Objective:

To gain knowledge about operating system, memory management and scheduling concepts and to study about the basics of OS, process management, Synchronization, memory management and File management.

UNIT I INTRODUCTION

Definition of OS - Mainframe System - Desktop Systems - Multi processor System - Distributed - Clustered - Real time Systems - Handheld Systems - Operating System Structure - System Components - Services - System Calls - System Programs - System Design and Implementation

UNIT II PROCESS MANAGEMENT


UNIT III PROCESS SYNCHRONIZATION

Critical Section - Synchronization Hardware - Semaphores - Problems of Synchronization - Critical Regions - Monitors - Deadlocks - Characterization - Handling Deadlocks - Deadlock Prevention - Avoidance - Detection - Deadlock Recovery

UNIT IV MEMORY MANAGEMENT


UNIT V FILE MANAGEMENT


BOOK FOR STUDY:


REFERENCES


Objective:

To obtain the knowledge about the technologies behind the mobile computing and its applications and to understand different mobile technologies and WAP.

UNIT I INTRODUCTION


UNIT II WIRELESS NETWORKS


UNIT III MOBILE NETWORK LAYER


UNIT IV MOBILE TRANSPORT LAYER

Traditional TCP- Indirect TCP- Snooping TCP- Mobile TCP- Fast retransmit/ Fast Recovery- Transmission/ Timeout Freezing – Selective Retransmission- Transaction Oriented TCP

UNIT V WAP


BOOK FOR STUDY:


REFERENCES


CS2813 - Cryptography & Network Security MC/4h/4cr/Th

Objective:

To learn the security issues in Computer Networks and mastering the Cryptographic algorithm.

UNIT I

Services, mechanisms and attacks-The OSI security architecture-A model for network security-Symmetric Cipher model- Substitution techniques- Transposition techniques- Simplified DES-Block Cipher principles- the strength of DES block- Cipher design principles and modes of operation.

UNIT II

Triple DES-Blow fish-RC5- Advanced Symmetric Block Ciphers- RC4 Stream Cipher-Confidentiality using symmetric encryption. Introduction to Number theory- Public Key cryptography and RSA.

UNIT III


UNIT IV


UNIT V

Intruders-intrusion detection- password management- viruses and Related threats-virus counter-measures- Fire wall design principles-Trusted systems.

BOOK FOR STUDY:


REFERENCES

Objective:

To develop a Database with enhanced models and Techniques and to understand about RDBMS, Object oriented Databases and issues.

UNIT I RELATIONAL DATABASES

Relational Model - Querying - Storage Structures - Query Processing - Normalization.

UNIT II OBJECT ORIENTED DATABASES

Introduction to Object Oriented Data Bases - Approaches - Modeling and Design - Persistence - Transaction - Concurrency - Recovery - Database Administration.

UNIT III EMERGING SYSTEMS

Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases.

UNIT IV CURRENT ISSUES

Rules - Knowledge Bases - Active and Deductive Databases - Distributed Databases and Parallel databases.

UNIT V DATABASE DESIGN ISSUES

Security - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

BOOK FOR STUDY:


REFERENCES


Objective:

To gain knowledge about operating system, memory management and scheduling concepts and to explore the features of Linux Operating System to implement, memory management and scheduling concepts, IPC, process management.

List of practical Exercises:

1) Inter Process Communication (IPC) Using Message Queues.
2) Program to implement inter process communication using pipes
3) Program to perform inter process communication using shared memory
4) Implementation of waits and signals using Binary Semaphores.
5) Counting Semaphores at the user level using Binary Semaphores.
6) Program to perform synchronization using semaphores
7) Dead Lock Detection (For process passing messages)
8) Process scheduling – FCFS, Round Robin
9) Producer-Consumer problem with limited others.
10) Dining-Philosopher Problem.
11) Reader-Writer Problem.
12) Two Process mutual exclusions.
13) Commands such as grep, sort, cmp, diff, etc.,
14) Shell Commands such as pr, wc, rm, echo, ls and IO redirection.
15) Commands using pipes and filters.
16) Write a program using lowlevel file operation to
   a. Copy a file.
   b. Insert line number.
   c. Count the number of characters.
17) Search a pattern in a file using 'lseek'.
18) Illustration of link, unlink, stat, fstat, umask, chmod, exec, fork, wait, system.
19) Banker's Algorithm
Objective:

This course highlights the basic concepts of J2EE and helps the student to equip with the programming skills in implementing the networking, servlet programming and web server concepts.

- **1. Applet program**
  a) creation of simple applet.
  b) creating graphics application using applet
  c) creating application form using applet
  d) creating action event program using applet.

- **2. Introduction to Java networking (TCP/IP client-server)**

- **3. Java database connectivity (using Access/Oracle)**
  a). insertion
  b). retrieval
  c). deletion

- **4. Networking using Remote Method Invocation**

- **5. Servlet programming**
  a) Simple servlet (Generic/http)
  b) Request information (Post/Get method)
  c) Cookies

- **6. Creation of simple bean using BDK.**

- **7. Creation of simple Application using EJB.**

- **8. Deployment of Session Beans using web server (Web logic/Tomcat)**

- **9. Deployment of Session Beans using web server (Web logic/Tomcat)**
Objective:

To learn the concept of Object-Oriented Methodology for developing a software application and to gain familiarity with Object-Oriented Analysis and Design.

UNIT I
Object Basics – Object-oriented methodologies: Introduction, The Unified approach -- UML.

UNIT II
Use-case models --- Object analysis --- Identifying Object relationships --- Attributes --- Methods --- Case studies.

UNIT III
Design processes --- design axioms --- Class design --- Object storage: Object-oriented database management systems, Object-relational systems, Designing access layer classes --- Case studies.

UNIT IV
User interface design --- View layer classes --- Micro level processes --- View layer interface --- Case studies.

UNIT V
Object orientation on testing --- Test cases --- Test plans --- Continuous testing --- Debugging principles --- System usability --- Measuring user satisfaction --- Case studies.

Book for Study:


REFERENCES

1) Booch, Grady; Jacobson; Rumbaugh, The Unified Modeling Language User Guide, Addison-Wesley, Pearson Education
3) Patrick W. Sheridan, Jean M. Sekula, Interactive UML Development suing V.B.6. BPB Publication
4) Martin Fowler, UML Distilled, Addison-Wesley, Edition III, ’04
   Kurt Bittner et al, Use Case Modeling, Addison-Wesley, ’03
Objective:

To acquire the knowledge about the compiler design and to understand the different phases of Compiler.

UNIT-I
Introduction – Structure of a Compiler – Compiler writing tools – Basic constructs of High level programming languages – Data structures – Parameter transmission.

Lexical Analysis – Role of Lexical analyzer – Finite Automata – Regular Expressions to Finite Automata – Minimizing number of states of Deterministic Finite Automaton – Implementation of Lexical analyzer in C.

UNIT-II

UNIT-III
Automatic Parsing Techniques – LR parser – Canonical Collection of LR(0) items – Construction of SLR parsing tables – LR(1) sets of items construction – Construction of canonical LR parsing tables.

UNIT-IV

UNIT-V

BOOK FOR STUDY:


REFERENCES:


Objective:

To develop software testing ability and Quality assurance and to learn about the test outlines, test cases, different types of tables and Quality Assurance.

Unit I


Unit II

From test outline to test cases: Introduction – Creating test cases – Documentation shortcuts; Using tables and spreadsheets: Introduction – Sample application – Documenting test cases.

Unit III


Unit IV


Unit V


Book for study:


REFERENCES

Computer Graphics and Multimedia Systems SE/4H/4 Cr/TH

Objective:

To develop skills and knowledge about computer graphics and multimedia and to understand 2D, 3D transformations and about multimedia applications.

UNIT I INTRODUCTION


UNIT II 2D TRANSFORMATIONS

Two dimensional transformations – Scaling and Rotations - Interactive Input methods - Polygons - Splines – Bezier Curves - Window view port mapping transformation.

UNIT III 3D TRANSFORMATIONS


UNIT IV OVERVIEW OF MULTIMEDIA


UNIT V MULTIMEDIA SYSTEMS AND APPLICATIONS

Multimedia communication systems – Data base systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – video on demand

BOOK FOR STUDY:


REFERENCES


Objective:

The course aims to give students with overall ideas and techniques which are behind recent development in the data warehousing and online analytical processing (OLAP) fields in terms of data models, query language, conceptual design methodologies, and storage techniques.

UNIT I

The need for data warehousing- key features of data warehousing –data ware houses and data marts – components – Metadata- significant trends- emergence of standards- web enabled data warehouse –planning the data warehouse-Data warehouse project –Defining business requirements- role of requirements in data warehousing.

UNIT II


UNIT III


UNIT IV

Matching information to the classes of Users- demand for online analytical processing – major features and functions- OLAP models-web enabled data warehouse – web based information delivery – data mining-techniques and applications.

UNIT V

Physical design steps-physical design considerations- physical storage- indexing the data warehouse – performance enhancement techniques- data warehouse deployment activities- consideration for pilot system - security-back up and recovery.

BOOK FOR STUDY:


REFERENCES

1. Sean Kelly,“Data Warehousing in Action ”, Reprint 2007, Wiley India.
Objective:

This course aims to give students a good overview of the ideas and techniques which are behind data communications and networking fields and also there is a need to know what TCP/IP provides, how to exploit its functionality, and what technical difficulties will be encountered.

Unit I: INTRODUCTION


Unit II: INTERNET PROTOCOL


Unit III: TRANSMISSION CONTROL PROTOCOL


Unit IV: STREAM CONTROL TRANSMISSION PROTOCOL


Unit V: APPLICATION PROTOCOLS


BOOK FOR STUDY:


REFERENCES

**Objective:**

This course aims to give students a good overview of the ideas and techniques about Linux, the remarkably complete operating system, including a graphical user interface, an X Window System, TCP/IP, the Emacs editor, and other components usually found in a comprehensive Linux. Linux is publicly open and extendible by contributors. Developers can write programs that can be ported to other operating systems.

**Unit – I**
Introduction to Linux, Shell Programming - shell, Pipes and redirection, working with Files – Linux File structure, standard I/O library, Formatted Input and Output, File and Directory maintenance, Managing Text-Based screens with curses - The screens, Keyboard, windows, sub windows, using color.

**Unit –II**
Data Management- managing memory, File locking, Processing and signals- Process, new Process, signals, Thread, Inter process communication- pipe, pipe call, socket, socket connections. Introduction to device Drivers - role of device driver, splitting the kernel, classes of devices and modules, security issues.

**Unit –III**
Building and running modules-the Hello world module- kernel modules Vs applications, compiling and loading, kernel symbol table, initialization and shutdown. Char drivers – design of scull, Major and minor numbers, some important data structures, char device registration, open and release.

**Unit – IV**
Debugging Techniques- Debugging by printing, Debugging by Querying, Debugging by watching, Debugging system faults. Interrupt handling- preparing parallel port, installing an interrupt handler, implementing a handler, interrupt sharing, Interrupt driven I/O.

**Unit – V**
Block drivers- Registration, the block device operations, Request processing, Introduction to the Linux kernel, Obtaining the kernel service, building the kernel, System calls, System call Handler-System call implementation.

**BOOK FOR STUDY:**


**REFERENCES**

CS3815 Linux Programming and Driver Development Lab 5h / 4Cr/Pr

Objective:

This course aims to gain knowledge in the open source system and to implement various system calls along with the critical section concepts. The debugging methods are also of the operating system are been focused.

Kernel Programming

1. Working with Load Balancer.
2. Scheduler- Related System Calls.
3. Creating user defined system calls.
4. Accessing the system call from user-space.
5. Implementing interrupt handlers.
6. Creating slab layers.
7. Task Scheduling using Linux.
8. Working with spin locks.

Device Drivers

9. Usage of Data Structures, File Operation, File Structures, Inode
10. Device Registration through scull.
11. Debugging support in the kernel.
12. Debugging system faults.
13. Semaphore implementation.
14. Locking functions.
15. Working with ioctl.
16. Working with poll, Select and epoll.
17. Implementing kernel timers.
18. Memory management through Linux.
Objective:
This course highlights the basic concepts of networking and helps the student to gain knowledge of various networking protocols. The network security is also been focused.

Unit I:

Unit II:

Unit III:
Networking Protocols: Address Resolution Protocol (ARP) - Reverse Address Resolution Protocol (RARP) -Dynamic host configuration protocol (DHCP) - Internet control message protocol (ICMP)-Routing.

Unit IV:

Unit V:
Domain Name System (DNS) -E-mail (SMTP)-World Wide Web (HTTP)-Simple Network management protocol (SNMP)-File Transfer Protocol (FTP)-Network Security: Firewall-Encryption and Decryption.

BOOK FOR STUDY:


REFERENCES

3. Benhrom Frouzan, ”Introduction to Data Communication“, Fourth edition 2005
Objective:

This course highlights the basic concepts of networking and helps the student to equip with the programming skills in implementing the communication between client and server using various protocols and to simulate bit stuffing with computation.

1. Checking for the connectivity of network using Ping Command and its other options
2. Assigning IP address and Subnet mask
3. Use Tracert command
4. Unix commands/Linux commands networking commands
5. Write a program to implement TCP Echo Client
6. Write a program to implement TCP Echo Server
7. Write a Program to check the Date and Time in TCP Date Time Client
8. Write a Program to check the Date and Time in TCP Date Time Server
9. Write a program to transfer a File using TCP.
10. Write a program to transfer Files using UDP.
11. Write a program to simulate the sliding window protocol
12. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
13. Write program to implement DNS client
14. Write a program to implement DNS server
15. UNIX socket programming.
17. Develop a Client – Server application for chat
18. Write a c program to simulate ARP/RARP
19. Write a client program to implement HTTP
20. Write a program to implement HTTP Server
21. Write a program to capture packets through the network interface
22. Simulate the functions of Data Link layer
23. Write a program to capture packets through the network interface
24. Implementation of a subset of Simple Mail Transfer Protocol using UDP
25. Implementation of a subset of File Transfer Protocol using TCP/IP