LOYOLA COLLEGE (AUTONOMOUS)
DEPARTMENT OF COMPUTER SCIENCE,
MASTER OF COMPUTER SCIENCE
(Effective from the Academic year 2008-2009)

SEM	TYPE	COURSE CODE	COURSE TITLE	HRS	CR
I	MC	CS1810	Design and Analysis of Algorithm	5	4
	MC	CS1811	Algorithm implementation through JAVA – Lab	5	3
	MC	CS1812	Computer Networks	5	4
	MC	CS1813	Software Engineering Methodologies	5	4
	MC	CS1814	Advanced Computer Architecture	5	4
	MC	CS1815	Advanced Web Design - Lab	5	3
II	MC	CS2811	Operating Systems	4	4
	MC	CS2812	Mobile Computing	4	4
	SU	CS2813	Cryptography & Network Security	4	4
	MC	CS2814	Advanced Database Management Systems	4	4
	MC	CS2815	Operating Systems Lab	5	3
	MC	CS2816	J2EE –Lab	5	3
	SE	CS2954	Object Oriented Analysis and Design / Principles of Compiler Design / Software testing and Quality Assurance / Computer Graphics and multimedia Systems	4	4
III	MC	CS3812	Data Warehousing	5	4
	MC	CS3813	TCP/IP Protocol	5	4
	MC	CS3814	Linux Programming and Driver Development	3	3
	MC	CS3815	Linux Programming and Driver Development	5	4
	MC	CS3816	Network Programming	3	3
	MC	CS3817	Network Programming Lab	5	4
	MC	CS3818	Mini Project	4	4
IV	MC	CS 4900	Project	30	16

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

Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work – Asymptotic notations – Mathematical analysis for recursive and non-recursive algorithms.

UNIT II DIVIDE AND CONQUER METHOD AND GREEDY METHOD

Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen's matrix multiplication – Greedy method – Prim's algorithm – Kruskal's algorithm – Dijkstra's algorithm.

UNIT III DYNAMIC PROGRAMMING

Computing a binomial coefficient – Warshall's and Floyd' algorithm – Optimal binary search tree – Knapsack problem – Memory functions.

UNIT IV BACKTRACKING AND BRANCH AND BOUND

Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem.

UNIT V NP-HARD AND NP-COMPLETE PROBLEMS

P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.

BOOK FOR STUDY

1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson Education 2003.

REFERENCES

1. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to algorithms" Prentice Hall 1990.

CS1811-Algorithms Implementation through Java-Lab

MC/5H/3 Cr/Pr

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.

3. Solve the knapsack problem using greedy method.

4. Construct a minimum spanning tree using greedy method.

5. Construct optimal binary search trees using dynamic programming method of problem solving.

6. Find the solution for traveling salesperson problem using dynamic programming approach.

7. Perform graph traversals.

8. Implement the 8 Queens Problem using backtracking.

9. Implement knapsack problem using backtracking.

10. Find the solution of traveling salesperson problem using branch and bound technique.

CS1812 -Computer Networks   MC/5H/4 Cr/TH

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

Building a network – Requirements – Network Architecture – OSI – Internet – Direct Link Networks – Hardware building blocks – Framing – Error detection – Reliable transmission.

UNIT II NETWORK FUNDAMENTALS

LAN Technology – LAN Architecture – BUS/Tree – Ring – Star – Ethernet – Token Rings – Wireless.

UNIT III NETWORK LAYER

Packet Switching – Switching and Forwarding – Bridges and LAN switches – Internetworking – Simple Internetworking – Routing.

UNIT IV TRANSPORT LAYER

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

UNIT V PRESENTATION LAYER and APPLICATIONS

Presentation formatting – Data compression – Cryptographic Algorithms: RSA - DES –– Applications – Domain Name Service – Email - SMTP – MIME – HTTP – SNMP.

BOOKS FOR STUDY

1. Larry L. Peterson & Bruce S. Davie, "Computer Networks - A systems Approach", 2nd Edition, Harcourt Asia/Morgan Kaufmann, 2000.

2. Andrew S. Tanenbaum, "Computer Networks", Tata Mcgraw Hill, 3rd Edition, 2001

REFERENCES

1. James F. Kurose and Keith W. Ross, "Computer Networking - A Top Down Approach featuring the Internet", 1st Edition, Addison Wesley Publishing Company, 2001.

2. William Stallings, "Data and Computer Communications", 5th Edition, PHI, 1997.

CS1813 - Software Engineering Methodologies   MC/5H/4 Cr/TH

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

Software Engineering Process paradigms - Project management - Process and Project Metrics – software estimation - Empirical estimation models - planning - Risk analysis - Software project scheduling.

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

User interface design - Human factors - Human computer interaction - Human - Computer Interface design - Interface design - Interface standards. Programming languages and coding - Language classes – Code documentation - Code efficiency - Software Configuration Management.

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:

1. Roger Pressman.S., Software Engineering: A Practitioner's Approach, (4th Edition), McGraw Hill, 1997.

REFERENCES

1. I. Sommerville, Software Engineering, V edition: Adison Wesley, 1996.

2. Pfleeger, Software Engineering, Prentice Hall, 1999.

3. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli Fundamentals of Software Engineering, Prentice Hall of India 1991.

CS 1814 – Advanced Computer Architecture   MC/5H/4 Cr/TH

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:

1. D.A Patterson and J.L. Hennessy, Computer Architecture - A Quantitative Approach, Morgan Kaufmann Publishers, 2nd edition 1996

REFERENCES

1. Vincent P. Heuring, Harry F. Jordan Computer Systems Design and Architecture, Addison Wesley, 1999.

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

Introduction to the web - Web- enabling Technologies - Web service Protocol - Web Design concepts - Examining good and bad web design - Page Design Resources.
Page Design - HTML - Web page style considerations - Page composition - Type faces - Tag parameters – Color and graphics for web pages - WYSIWYG web page editor - Dream weaver.

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

PHP: Introduction – language reference – basic syntax – variables- constants – expressions – operators – control structures – functions- classes – objects – exceptions.
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:

1. Deitel and Deitel, Internet and World Wide Web how to program, Prentice Hall, 2000.
References:

1. *Bob Breed Love, Web Programming Unleashed, Sams net Publications, 1996.*

2. *DHTML `O' Reiley Publications, 2000.*

3. Tim Converse, Joyce Park and Clark Morgan, "PHP 5 and MySQL", Wiley india reprint, 2008. 2. Robert Sheldon, Geoff Moes, "Beginning   MySQL", Wrox, 2005.

4. Alexis Leon and Mathews Leon, "Database Management Systems", Vikas, 2008.

CS2811- Operating Systems   MC/4H/4 Cr/TH

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

Concepts-Process Scheduling-Operations on Processes-Co-operating Processes-Inter Process Communication-CPU Scheduling-Scheduling Concepts-Criteria-Scheduling Algorithms-Multiprocessor Scheduling-Real time Scheduling

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

Storage Hierarchy-Storage Management Strategies-Contiguous-Non Contigous Storage Allocation-Single User-Fixed Partition-Variable Partition-Swapping-Virtual Memory-Basic Concepts-Multilevel Organization-Block Mapping-Paging-Segmentation-Page Replacement Methods-Locality-Working Sets I/O AND FILE SYSTEMS

UNIT V FILE MANAGEMENT

Disk Scheduling-File Concepts-File System Structure-Access Methods-Directory Structure-Protection-Directory Implementation-Allocation Methods-Free Space Management-Case Study: Linux System

BOOK FOR STUDY:

1. Silberschatz and Galvin, Operating System Concepts, 6th Edition, John Wiley & Sons, Inc., 2004

REFERENCES

1. Milankovic M., Operating System Concepts and Design, 2nd Edition, McGraw Hill, 1992

2. P.C.Bhatt, An Introduction to Operating Systems-Concepts and Practice, Prentice Hall Of India, 2004

3. H.M.Deitel, An Introduction to Operating Systems, 2nd Edition, Pearson Education, 2002

CS2812- Mobile Computing   MC/4H/4 Cr/TH

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

Medium Access Control : Motivation for Specialized MAC- SDMA- FDMA- TDMA- CDMA- Comparison of Access mechanisms – Tele communications : GSM- DECT- TETRA – UMTS- IMT-200 – Satellite Systems: Basics- Routing- Localization- Handover- Broadcast Systems: Overview – Cyclic Repetition of Data- Digital Audio Broadcasting – Digital Video Broadcasting

UNIT II WIRELESS NETWORKS

Wireless LAN: Infrared Vs Radio Transmission – Infrastructure Networks- Ad hoc Networks- IEEE 802.11 – HIPERLAN – Bluetooth- Wireless ATM: Working Group- Services- Reference Model – Functions – Radio Access Layer – Handover- Location Management- Addressing Mobile Quality of Service- Access Point Control Protocol

UNIT III MOBILE NETWORK LAYER

Mobile IP : Goals – Assumptions and Requirement – Entities – IP packet Delivery- Agent Advertisement and Discovery – Registration – Tunneling and Encapsulation – Optimization – Reverse Tunneling – IPv6 – DHCP- Ad hoc Networks

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

Architecture – Datagram Protocol- Transport Layer Security- Transaction Protocol- Session Protocol- Application Environment-Wireless Telephony Application

BOOK FOR STUDY:

1. J.Schiller, Mobile Communication, Addison Wesley, 2000.

REFERENCES

1. William C.Y.Lee, Mobile Communication Design Fundamentals, John Wiley, 1993.

2. William Stallings, Wireless Communication and Networks, Pearson Education, 2003.

3. Singhal, WAP-Wireless Application Protocol, Pearson Education, 2003.

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

Key Management - Diffie Hellmann key exchange-Message authentication and hash functions - Hash algorithms - Digital signatures and authentication protocols – Digital signature standard.

UNIT IV

Authentication applications - Pretty good privacy - S/MIME - IP security – Web security considerations - Secure sockets Layer Transport layer security- Secure Electronic transaction.

UNIT V

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

BOOK FOR STUDY:

William Stallings, "Cryptography and Network Security Principles and Practices", Third edition, PHI, Ninth Indian reprint, 2005.

REFERENCES

1. William Stallings, **"**SNMP, SNMPV2, SNMPV3 and RMON1 and 2",
Addison Wesley, 1999.
2. Uyless Black, **"**Network Management Standards**"**, McGraw Hill, 1995.
3. Atul Kahate, "Cryptography and Network Security", Tata McGraw – Hill, 2003
4. Roberta Bragg, Mark Rhodes-Ousley, Keith Strassberg, "Network Security", Tata McGraw-Hill, 2004

CS2814- Advanced Database Management Systems   MC/4H/4Cr/TH

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:

1. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, Addison Wesley, 2000.

REFERENCES

1. Gary W. Hanson and James V. Hanson, Database Management and Design, Prentice Hall of India Pvt Ltd, 1999.

2. Alex Benson, Stephen Smith and Kurt Thearling, Building Data Mining Applications for CRM, Tata McGraw-Hill, 2000.

CS2815 – OPERATING SYSTEMS – LAB MC/5H/3 Cr/Pr

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

CS-2816 - J2EE LAB   MC/5H/3 Cr/Pr

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 Introuduction 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)

CS2954 - Object Oriented Analysis & Design   SE/4H/4 Cr/TH

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:

1) Ali Bahrami --- Object-Oriented Systems Development
        Mcgraw-Hill International Edition-1999.

REFERENCES

1) Booch, Grady; Jacobson; Rumbaugh, The Unified Modeling Language User Guide, Addision-Wesley, Pearson Education
2) Terry Quatrani, Visual Modeling with Rational Rose and UML, Addision-Wesley, Pearson Education, Edition III, '03
3) Patrick W. Sheridan, Jean M. Sekula, Interactive UML Development suing V.B.6. BPB Publication
4) Martin Fowler, UML Distilled, Addision-Wesley, Edition III, '04
        Kurt Bittner et al, Use Case Modeling, Addision-Wesley, '03

Principles of Compiler Design   SE/4H/4 Cr/TH

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

Parsing Techniques – Context free Grammars – Derivations and Parse trees – Ambiguity – Capabilities of Context free grammar - Top down and Bottom up Parsing – Handles – Shift Reduce parsing – Operator precedence parsing – Recursive Descent parsing – Predictive Parsing

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

Syntax Directed Translation – Semantic action – Implementation of syntax directed translators – Intermediate code: Prefix notation, Quadrples, Triples, Indirect triples – Methods of translation of assignment statements, Boolean expressions and Control statements.

UNIT-V

Symbol Tables and Code Generation: Representing information in a symbol table – Data structures for symbol table – Introduction to code optimization – Basic blocks – DAG representation – Error detection and Recovery – Introduction to Code generation.

BOOK FOR STUDY:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman, "Compilers : Principles, Techniques, and Tools, Pearson Education Asia, 2001

REFERENCES:

1. Dhamdhere D.M., "Compiler Construction: Theory and Practice", McMillan India Ltd., 1983

2. Holub Allen, "Compiler Design in C", Prentice Hall of India, 1990

Software Testing and Quality Assurance   SE/4H/4 Cr/TH

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

Tackling the testing maze: Introduction – Sample application – The incremental testing approach – Next steps; Testing outlines: Introduction – Sample application – The outline approach – Evaluating the outline – Schedule estimation.

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

Other types of tables: Introduction – State machines – Test case table with multiple inputs – Decision tables – Applications with complex data – Managing tests; Testing object-oriented software: Introduction – Comparing object-oriented and procedural software – System testing examples – Unit testing of classes.

Unit IV

Testing web applications: Introduction – Sample application – Functional and usability issues – configuration and compatibility testing – Reliability and availability – Performance – Security testing – End – to – end transaction testing – Database testing – Post implementation testing.

Unit V

Quality Concepts – The Quality Movement – Software Quality Assurance – Software Reviews – Formal Technical Reviews – Statistical software Quality Assurance – Software Reliability – The ISO 9000 Quality Standards – The SQA Plan.

Book for study:

1. Louise Tamres, Introducing Software Testing, Pearson Education, Second Reprint 2003.

2. Roger S. Pressman, Software Engineering, McGraw-Hill International, 5th Edition.

REFERENCES

1. Watts S. Humphrey, Introduction to the Personal Software Process, Addison Wesley, 2000.

2. Cem Kaner and et al., Testing Computer Software, Comdex, 2nd Edition.

3. William E. Perry, Effective Methods for Software Testing, Wiley, 2nd Edition.

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

Overview of Graphics System - Bresenham technique – Line Drawing and Circle Drawing Algorithms - DDA - Line Clipping - Text Clipping.

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

3D Concepts - Projections – Parallel Projection - Perspective Projection – Visible Surface Detection Methods - Visualization and polygon rendering – Color models – XYZ-RGB-YIQ-CMY-HSV Models - animation – Key Frame systems - General animation functions - morphing.

UNIT IV OVERVIEW OF MULTIMEDIA

Multimedia hardware & software - Components of multimedia – Text, Image – Graphics – Audio – Video – Animation – Authoring.

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:

1. Hearn D and Baker M.P, "Computer graphics – C Version", 2nd Edition, Pearson Education, 2004(unit 1, 2 & 3)

2. Ralf Steinmetz, Klara steinmetz, "Multimedia Computing, Communications and Applications", Pearson education, 2004 (Unit 4 & 5)

REFERENCES

1. Siamon J. Gibbs and Dionysios C. Tsichritzis, "Multimedia programming", Addison Wesley, 1995.

2. John Villamil, Casanova and Leony Fernanadez, Eliar, "Multimedia Graphics", PHI, 1998.

CS3812 Data warehousing 5h /4cr/Th

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 hoses 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

Data warehouse architecture –architectural framework –technical architecture –infrastructure supporting architecture- hardware and Operating systems –database software- collection of tools- Need for metadata- Metadata types by functional areas- business metadata- technical metadata- business metadata-how to provide metadata.

UNIT III

Principles of dimensional modeling –updates to the dimension table – aggregate fact tables- families of STARS- data extraction – data transactions- data loading –data quality- challenges-data quality tools- data equality initiative.

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:

Paulraj Ponniah, "Data Warehousing Fundamentals a Comprehensive guide for IT professionals", Wiley India.Reprint 2008.

REFERENCES

1. Sean Kelly,"Data Warehousing in Action ", Reprint 2007, Wiley India.
2. William H Inmon,"Building the Data Warehouse", Fourth Edition, Wiley India.
3. Soumendra Mohanty, "Data Warehousing Design, Development and best practices, Tata McGraw Hill.

CS3813 TCP/IP Protocol   5h / 4Cr/Th

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

Introducing TCP/IP   – IP addressing   – Subnetting – Supernetting – IP packets – Delivery – Routing – Routing model – Routing table – Structure of a Router– ARP – RARP.

Unit II: INTERNET PROTOCOL

Datagram – Fragmentation – Checksum – IP Package Design– Internet control message protocol – message format – Error Reporting – Query – Checksum – Debugging Tools -Internet group management protocol – IGMP Messages –IGMP Operation – Encapsulation – IGMP Package .

Unit III: TRANSMISSION CONTROL PROTOCOL

User Datagram protocol – UDP operation – Application Of UDP – UDP design – TCP services – Flow control – Error control – TCP operation and design – TCP Connection – Transition diagram – Congestion control

Unit IV: STREAM CONTROL TRANSMISSION PROTOCOL

SCTP Services – SCTP Features - Packet Format -   An SCTP Association – State Transition Diagram – Flow Control – Error Control – Congestion Control.

Unit V: APPLICATION PROTOCOLS

File Transfer Protocol – Trivial File Transfer Protocol – Simple Mail Transfer Protocol – Simple Network Management Protocol – Hyper Text Transfer Protocol.

BOOK FOR STUDY:

1. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill, Third Edition, Eleventh reprint 2008.

REFERENCES

1. Douglas E. Comer, David L. Stevens, "Internetworking with TCP/IP – Volume I, II and III", Prentice-Hall of India Pvt. Ltd., 2nd Edition 1994.
2. K.Washburn, J.T.Evans, "TCP/IP – Running a successful Network ", Addison – Wesley Publishing Company, First Edition 1995.

CS3814 Linux Programming and Driver Development
3h / 3Cr/ Th

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 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:

1. "Beginning Linux Programming" Neil Matthew, Richard stones, Alan Cox, Wrox Publication.

2. "Linux Device Drivers", Alessandro Rubini, Jonathan Corbet, Third Edition.

3. "Linux Kernel Development" Robert Love, 2nd Edition.

REFERENCES

1. Tim Burke, Mark A. Parenti, and AI Wojtas, Writing Device drivers, Tutorial and reference, Butterworth-Heinemann, July, 1995.

2. George pajari, Writing Unix device drivers, Addision Wesley Professional, November, 1991.

3. Mel Gorman, Understanding the Linux Virtual Memory Manager, Prentice Hall, 2004.

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.

CS3816 Network Programming 3h/3cr/Th

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:
Introduction: Components of Computer (Motherboard, System Memory, Bios, Keyboard, Monitor, Serial Port, Parallel Port, Hard disk drive Modem, CDROM Drive).- Operating System-Types of OS (LINUX, UNIX, Windows 2003, Windows XP). Introduction to Networking-Types of Network (WAN, LAN, MAN)Peer to Peer & Client Server model- Network Topologies (BUS, STAR, Ring)- Network devices(Hub/Switch/Repeaters/Bridge/Router) - Network Cabling(Twisted Pair, Co-axial, Fiber Optic) - NIC Card.

Unit II:
Network Reference Model: ISO-OSI Model (application, presentation Session, Transport, Network Data link, Physical) -TCP/IP Model (Application, Transport, internet work, Network interface). - Basic Concept of IP Address/MAC Address/Subnet mask-PING/TRACERT.

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:
Transport Layer-User datagram protocol (UDP)-Transmission Control Protocol – Congestion Control – Queuing Disciplines-Congestion Avoidance mechanism (DECbit Random Early Detection (RED) Source-Based Congestion Avoidance)

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:

1. Wendell Odom, "Introduction to CISCO Networking Technologies", Dorling Kindersley Publishing Inc., and Pearson Education, Inc., 2006

2. Larry L. Peterson, Bruce S.Davie,"Computer Networks: A System Approach", Third Edition, Morgan Kauffman Publishers Inc., 2003.

3. Andrew .S. Tanenbum, "Computer Networks", Fourth Edition, 2003

REFERENCES

1. James F. Kuross, Keith W. Boss,"Computer Networking, A Top down Approach Featuring the internet", Third Edition, Addison Wesley, may13 2004.

2. Jain S," Data Communication and Networking", BPB Publications .Second Edition.

3. Benhrom Frouzan, "Introduction to Data Communication", Fourth edition 2005

CS3817 Network Programming Lab 5h / 4Cr/ Pr

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.

16. Simulation of BGP routing protocol.

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