

Advanced Database Systems

CSE – 324 (Departmental Elective – I)

L T P

Theory : 100

3 2 -

Sessional : 50

Unit - I

Parallel & Distributed Data bases

Architecture for Parallel query evaluation, parallel zing individual Operations, parallel query optimization; Introduction to distributed databases, Distributed DBMS architectures, storing data in a distributed DBMS, distributed catalog Management, distributed query processing ,updating distributed data, introduction to distributed data, Introduction to distributed transactions, distributed concurrency control, recovery.

Unit - II

Data Mining

Introduction, counting co-occurrences, mining for rules, tree structured rules, Clustering, similarity search over sequences.

Unit - III

Object Database Systems

User defined ADT, structured types, objects & references types, inheritance, design for an ORDBMS &ORDBMS.

Unit - IV

Advanced Topics

Advanced transaction processing integrated access to multiple data source, mobile database main memory databases, multimedia databases. GIS. temporal & sequence databases

BOOKS

1. R. Ramakrishan & J. Gehrks Database Management systems MGH, International ED. 2000.
2. Korth .Silberschatz Sudershan : Database concepts, MGH , 2001
3. C.J Date. Database Systems 7th ED., Addison Wesley, Pearson Education 2000.

Computer Hardware Technology

CSE – 304

L T P

Theory : 100

4 1 -

Sessional : 25

Unit - I

Memory : Memory, memory chips & modules, memory types, advanced memory technologies, troubleshooting.

Power supply

Power supply functions and operation, Power supply quality and specification, Power protection & backup, backup power system: UPS, troubleshooting Power supply.

Unit - II

Motherboard : PC family tree, motherboard controllers, and system resources, input-output ports, IRQ, I/O bus system: ISA, MCA, EISA, VESA local bus, PCI, AGP, PCI-X; on board I/O devices, ROMBIOS, ROM POST, CMOS setup.

Unit - III

Interfaces and I/O Ports : Floppy disk interface, IDE interface, ATA standards, master-slave configuration, data transfer mode, SCSI interface, SCSI bus, SCSI standards, which is better SCSI or IDE, serial ports, parallel ports, USB, video adapters, troubleshooting video adapters.

Unit - IV

Device drives and peripherals : Floppy disk drive, hard disk drive, CD ROM drive, DVD ROM drive, record able drives, keyboards, mice, printers and monitors, troubleshooting drives and peripherals.

NOTE: At least 1 question must be set from each unit.

BOOKS

1. Craig Zacker & John Rourtne: PC hardware- The complete reference, TMH
2. Mark Minosi: The complete PC upgrading & maintenance Guide 4/e, BPB publications.
3. S. K. Chauhan: PC upgrading, maintenance and troubleshooting Guide

Mobile Computing

CSE – 302

L T P

Theory : 100

4 2 -

Sessional : 50

Unit – 1

Introduction Challenges in mobile computing. Coping with uncertainties, resource poorness; bandwidth, etc. Cellular architecture, co-channel interference, frequency reuse, capacity increase by cell splitting. Evolution of mobile system : CDMA, FDMA, TDMA GSM.

Mobility Management : Cellular architecture. Co-channel interference, Mobility: handoff, types of handoffs; location management. HLR-VLR scheme, hierarchical scheme, predictive location management schemes. Mobile IP cellular IP

Unit – 2

Publishing & Accessing Data in Air : Pull and push based data delivery models, data dissemination by broadcast, broadcast disks, directory service in air, energy efficient indexing scheme for push based data delivery.

File System Support for Mobility : Distributed file sharing for mobility support. Coda and other storage manager for mobility support.

Unit – 3

Ad-hoc Network Routing Protocols : Ad hoc network routing protocols, destination sequenced distance vector algorithm, cluster based gateway switch routing, global state routing, fish-eye state routing, dynamic source routing, ad-hoc on-demand routing, location aided routing, zonal routing algorithm.

Unit – 4

Mobile Transaction and Commerce : Models for mobile transaction, Kangaroo and joey transactions, team transaction. Recovery model for mobile transactions. Electronic payment and protocols for mobile commerce.

NOTE: At least 1 question must be set from each unit.

Books :

1. Mobility : Processes, Computers, and Agents, Dejan Milojic, Frederick Douglass, Richard Wheeler, Addison-Wesley Professional.

2. Lvan Stojmenovic (Editor), Handbook of Wireless Networks and Mobile Computing, Wiley, ISBN
3. Yi-Bing Lin & Lmrich Chlamtac, "Wireless and Mobile Networks Architectures", John Wiley & Sons. 2001.
4. Raj Pandya, "Mobile and Personal Communication System and Services", Prentice Hall of India 2001.

Software Engineering

CSE – 308

L T P

Theory : 100

4 1 -

Sessional : 25

Unit – 1

Software and Software engineering. Software characteristics, software cruxes, software engineering paradigms.

Planning a software project-software cost estimation, project scheduling, personal planning, team structure.

Unit – 2

Software configuration management, quality assurance, project monitoring, disk management.

Software requirement analysis-structured analysis, object oriented analysis and data modeling, software requirement specification, validation.

Unit – 3

Design and implementation of software – software design fundamentals, design methodology (structured design and object oriented design). Design verification, monitoring and control coding.

Software reliability : metric and specification, fault avoidance and tolerance, exception handling, defensive programming.

Unit – 4

Testing – Testing fundamentals, white box and black box testing software testing software testing strategies : unit testing, integration testing, validation testing, system testing, debugging.

Software Maintenance – maintenance characteristics, maintainability, maintenance tasks, maintenance side effects.

CASE tools.

NOTE: At least 1 question must be set from each unit.

Books :

1. Pressman S.Roger, Software Engineering, Tata McGraw Hill.
2. Jalote Pankaj An integrated approach to software engineering Narosa Publ. House.
3. Sommerville lae, Software Engineering, 5th ed., Addison Wesley- 2000
4. Fairley Richard, Software. Software Engineering Concepts, Tata MaGraw Hill.

Network Management and Security

CSE – 306

L T P

Theory : 100

4 1 -

Sessional : 50

Unit – 1

Introduction : need and basic goals for computer security, security threats etc.

Cryptographic building blocks, symmetric and asymmetric key cryptography, cryptography hash function, digital signature schemes etc., with representative applications for each.

Unit – 2

Operating System Security : low-level protection mechanisms, access control : models for access control, some confidentiality, integrity, and hybrid models of access control such as Bell-La Padula Biba. Chinese Wall etc., discretionary v/s mandatory access control.

Case studies : Java access control policy specifications. SELinux security model and implementation. Program flaws : bugs which have security implications such as buffer overflows, race conditions etc.

Unit – 3

Malicious code : viruses, worms. Trojan horses: how they work and how to defend against them.

Network Security : problems in network security; kinds of attacks, PKI, key exchange protocols, example protocols such as PGP, Kerberos, IPSEC/VPN, SSL. S/MIME etc.

Unit – 4

Protocol vulnerabilities : examples of protocol vulnerabilities such as in TCP/IP, denial of service attacks, etc.

NOTE: At least 1 question must be set from each unit.

Books :

1. Michael E. Whitman & Herbert J. Mattord, Principles of Information Security.
2. William Stallings “Cryptography and Network Security” Pearson Education.
3. Charles P. Pfleger “Security in Computing” Prentice Hall.
4. Jeff “Inside Internet Security” Addison Wesley.

Computer Hardware & Troubleshooting (Pr.)

CSE – 304

L T P

Practical : 50

- - 3

Sessional : 50

1. To solder and de-solder various components.
2. To check and measure various supply voltages of PC.
3. To make comparative study of motherboards: 386, 486, PI, PII, PIII.
4. To observe and study various various cables, connections and parts used in computer communication.
5. To study various cards used in a system viz., display card, LAN card etc.
6. To remove, study and replace floppy disk drive.
7. To remove, study and replace hard disk.
8. To remove, study and replace CD ROM drive.
9. To study monitor, its circuitry and various presets and some elementary fault detection.
10. To study printer assembly and elementary fault detection of DMP and laser printers.
11. To observe various cables and connectors used in networking.
12. To study parts of keyboard and mouse.
13. To assemble a PC.
14. Troubleshooting exercises related to various components of computer like monitor, drives, memory, and printers etc.

Books

1. Mark Mines Complete PC upgrade & maintenance guide. BPB publications.
2. Craig Zacker & John Rouske, PC Hard ware : The Complete Reference TMH.
3. Scott Mueller, Upgrading and Repairing PCs. PHI, 1999.

Mobile Computing (Pr.)

CSE – 314

L T P

Practical : 50

- - 3

Sessional : 50

1. Design a prototype that implements the Cache management for a mobile computing environment?
2. Design a System : The challenges of developing high performance, high reliability, and high quality software systems are too much for ad-hoc and informal engineering techniques that might have worked in the past on less demanding systems. New techniques for managing these growing complexities are required to meet today's time-to-market, productivity and quality demands.
3. Peer-to-peer communication system : As computers become more pervasive and homes become better connected, a new generation of applications will be deployed over the internet. In this model. Peer-to-peer applications become very attractive because they improve scalability and enhance performance by enabling direct and real-time communication among the peers. We need to propose a decentralized management system that manages the peer-to-peer applications and the system resources in an integrated way : monitors the behavior of the peer-to-peer applications transparently and obtains accurate resource projections, manages the connections between the peers and distributes the objects in response to the user requests and changing processing and networking conditions.
4. Write programs that implement the few sorting algorithms (bubble, selection, etc) for n data. It stops the operation when the counter for sorting index is at 100, 1000, 10000 and so on, stores the contents of the registers, program counter and partially sorted list of data, etc. It resumes the operation after 30 s from the point of the termination.
5. Write a program that implements the bubble sort for n data. It stops the operation when the counter for sorting index is at 100, 1000, 10000 and so on. Stores the contents of the registers, program counter and partially sorted list of data. etc. it transfers the code and data across the network on the new destination and resumes the operation from the point of termination on the previous node. Finally the result from the last node in the itinerary is sent back to the process – initiating node.
6. Develop a prototype that performs parallel computation of the same task on different nodes. Finally process initiator (master node) receives the result and computation time required to complete the task on an each node and displays to the users. Compare the computing power of different nodes.

Books :

1. Mobility Processes Computers, and Agents, Dejan Milojieic. Frederick Douglass, Richard Wheeler, Addison –Wesley Professional : 1st edition
2. Ivan Stojmenovic (Editor), Handbook of Wireless Networks and Mobile Computing, Wiley, ISBN
3. Core Java Volume I and II from Sun Micro Systems.

4. Huges, Java Networking, Hut Publication Pune
5. Java 2: The Complete Reference 4/e : Herbert Schildt. TMH Delhi.
6. Java Beans Programming from the Ground Up : Joseph O'Neil, TMH Delhi
7. Java Servelets : Application Development : Karl Moss, TMH Delhi

Software Engineering (Pr.)

CSE – 316

L T P

Practical : 50

- - 3

Sessional : 50

1.
 - (i) Implement Receipt Acknowledgement and updation of Inventory (RAUP)
 - a) Find unadjusted Functional points (DFP)
 - b) Calculate FPC by Mark II Method
 - (ii) To estimate effort and schedules

Calculate the compression factor and the manpower required based on given information of software.
2. Suggest an action plan for the following risks without compromising the project, process or product parameters.
 - a) Language skills inadequate in two people in a team of five.
 - b) Specially ordered hardware and software likely to be delivered three months late.
 - c) Customer and end user not convinced on new technology implementation as a correct choice.
 - d) Software required interface with other technologies on which the project team has n experience.
3. Implement a Testing strategy for the following software development cases :
 - (a) Rule based deterministic closed large but simple payroll system for a company
 - (b) Development of a customer relation management system for a retail distribution chain. The retail organization is not sure about the scope, and failure feature.
 - (c) Modification to existing order processing system for a multi-location multi-product company.
4. Build a work breakdown structure for the following
 - a) Delivery of the software, initiation to development covering lifecycle.
 - b) Development of prototype
 - c) Development of a process for a faction
5. In a hospital management system develop the following diagrams for a Ward Service Management System (SMS)
 - a) Work Flow
 - b) System Flow
 - c) DFD
6. Draw three level DFD's for CLPS. Modularize the CLPS and structure them top-down as functional model.
7. Conduct a task analysis for the following users :
 - (a) officer at railway ticket reservation window.
 - (b) officer at insurance claim settlement desk.
 - (c) clerk at call center, answering queries of customers who have purchased cars from the company.

8. Based on the business model of DEL develop a modular structure for a business system model. Draw a complete system flowchart.

Books

1. W.S. Jawadekar, Software Engineering Principle and Approaches TMH 2004.
2. Pressman S.Roger, Software Engineereing, Tata McGraw – Hill.
3. Jalote Pankaj, An integrated approach to software engineering Narosa Pub.
4. Sommerville Ian, Software Engineering 5th ed. Addison Wesley 2000.
5. Fairley Richard, Software, Software Engineering Concepts. Tata McGraw-Hill.