

B.E. Sem.VII [INFT]
ADBMS

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

1. The Extended Entity Relationship Model and Object Model :

The ER model revisited, Motivation for complex data types, User Defined Abstract Data Types and Structured Types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and Characteristics of Specialization and Generalization. Relationship Types of Degree Higher Than Two.

2. Object–Oriented Databases :

Overview of Object–Oriented Concepts. Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type Hierarchies and Inheritance, Type extents and Queries, Complex Objects; Database Schema Design for OODBMS; OQL, Persistent Programming Languages; OODBMS Architecture And Storage Issues; Transactions and Concurrency control. Example of ODBMS.

3. Object Relational and Extended Relational Databases :

Database Design For An ORDBMS – Nested Relations and Collections; Storage And Access methods, Query processing and Optimization; An Overview of SQL3, Implementation Issues for Extended Type; Systems. Comparison of RDBMS, OODBMS, ORDBMS.

4. Parallel and Distributed Databases and Client–Server Architecture :

Architectures For Parallel Databases, Parallel Query Evaluation; Parallelizing Individual Operations, Sorting, Joins; Distributed Database Concepts, Data Fragmentation, Replication, and Allocation techniques for Distributed Database Design; Query Processing in Distributed Databases; Concurrency Control and Recovery in Distributed Databases. An Overview of Client–Server Architecture.

5. Databases on the Web and Semi Structured Data :

Web Interfaces to the Web, Overview of XML; Structure of XML Data, Document Schema, Querying XML Data; Storage Of XML Data, XML Applications; The Semi Structured Data Model, Implementation Issues. Indexes for Text Data.

6. Enhanced Data Models for Advanced Applications :

Active Database Concepts. Temporal Database Concepts; Spatial Databases, Concepts and architecture; Deductive Databases and Query processing; Mobile Databases, Geographic Information Systems.



B.E. Sem.VII [INFT]
Computer Simulation and Modeling

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

1. **Introduction to Simulation :** System and System environment, Components of system, Type of systems, Type of models, Steps in simulation study, Advantages and Disadvantages of simulation.
2. **Simulation Examples :** Simulation of Queueing systems, Other examples of simulation.
3. **General Principles :** Concepts of discrete event simulation, List processing,
4. **Simulation Software :** History of simulation software, Desirable software features, General-purpose simulation packages, Object oriented simulation, Trends in simulation software.
5. **Statistical Models in Simulation :** Useful statistical model, Discrete distribution, Continuous distribution, Poisson process, Empirical distribution.
6. **Queueing Models :** Characteristics of Queueing systems, Queueing notations, Long run measures of performance of Queueing systems, Steady state behavior of infinite population markovian models, Steady state behavior finite population model, Network of Queues.
7. **Random Number Generation :** Properties of random numbers, Generation of pseudo random numbers, Techniques for generating random numbers, Tests for random numbers.
8. **Random Variate Generation :** Inverse transform technique, Convolution method, Acceptance rejection techniques
9. **Input Modeling :** Data Collection, Identifying the Distribution of data, Parameter estimation, Goodness of fit tests, Selection input model without data, Multivariate and Time series input models.
10. **Verification and Validation of Simulation Model :** Model building, Verification, and Validation, Verification of simulation models, Calibration and Validation of models.
11. **Output Analysis for a Single Model :** Types of simulations with respect to output analysis, Stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators, Output analysis for steady state simulation.
12. **Comparison and Evaluation of Alternative System Design :** Comparison of two system design, Comparison of several system design, Meta modeling, Optimization via simulation.
13. **Case Studies :** Simulation of manufacturing systems, Simulation of computer systems, Simulation of super market, Simulation of pert network.



B.E. Sem.VII – [INFT]
Embedded Systems

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

- 1. An overview of embedded systems:** Introduction to embedded systems, Categories and requirements of embedded systems, Challenges and issues related to embedded software development, Hardware/Software co-design, Introduction to IC technology, Introduction to design technology.
- 2. Embedded Software development:** Concepts of concurrency, processes, threads, mutual exclusion and inter-process communication, Models and languages for embedded software, Synchronous approach to embedded system design, Scheduling paradigms, Scheduling algorithms, Introduction to RTOS, Basic design using RTOS.
- 3. Embedded C Language:** Real time methods, Mixing C and Assembly, Standard I/O functions, Preprocessor directives, Study of C compilers and IDE, Programming the target device.
- 4. Hardware for embedded systems:** Various interface standards, Various methods of interfacing, Parallel I/O interface, Blind counting synchronization and Gadget Busy waiting, Parallel port interfacing with switches, keypads and display units, Memory and high speed interfacing, Interfacing of data acquisition systems, Interfacing of controllers, Serial communication interface, Implementation of above concepts using C language.
- 5. Study of ATMEL RISC Processor:** Architecture, Memory, Reset and interrupt, functions, Parallel I/O ports, Timers/Counters, Serial communication, Analog interfaces, Implementation of above concepts using C language, Implementation of above concepts using C language.
- 6. Case studies and Applications of embedded systems:** Applications to: Communication, Networking, Database, Process Control, Case Studies of: Digital Camera, Network Router, RTLinux.



B.E. Sem.VII – [INFT]
Image Processing

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

1. **Introduction to Computer Graphics:** Geometry and line generation, Graphics primitives, Transformations
2. **Digital Image Processing Systems:** Introduction, Structure of human eye, Image formation in the human eye, Brightness adaptation and discrimination, Image sensing and acquisition, Storage, Processing, Communication, Display. Image sampling and quantization, Basic relationships between pixels
3. **Image Transforms (Implementation):** Introduction to Fourier transform, DFT and 2-D DFT, Properties of 2-D DFT, FFT, IFFT, Walsh transform, Hadamard transform, Discrete cosine transform, Slant transform, Optimum transform: Karhunen - Loeve (Hotelling) transform.
4. **Image Enhancement in the Spatial Domain:** Gray level transformations, Histogram processing, Arithmetic and logic operations, Spatial filtering: Introduction, Smoothing and sharpening filters
5. **Image Enhancement in the Frequency Domain:** Frequency domain filters: Smoothing and Sharpening filters, Homomorphic filtering
6. **Wavelets and Multiresolution Processing:** Image pyramids, Subband coding, Haar transform, Series expansion, Scaling functions, Wavelet functions, Discrete wavelet transforms in one dimensions, Fast wavelet transform, Wavelet transforms in two dimensions
7. **Image Data Compression:** Fundamentals, Redundancies: Coding, Interpixel, Psycho-visual, Fidelity criteria, Image compression models, Error free compression, Lossy compression, Image compression standards: Binary image and Continuous tone still image compression standards, Video compression standards.
8. **Morphological Image Processing:** Introduction, Dilation, Erosion, Opening, Closing, Hit-or-Miss transformation, Morphological algorithm operations on binary images, Morphological algorithm operations on gray-scale images
9. **Image Segmentation:** Detection of discontinuities, Edge linking and Boundary detection, Thresholding, Region based segmentation
10. **Image Representation and Description:** Representation schemes, Boundary descriptors, Regional descriptors



BE. Sem.VII [INFT]
Management Information Systems

Syllabus

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

- 1. Foundation of Information System:** Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, MIS organization within company, Management information and the systems approach.
- 2. Information Technology:** A manager's overview, managerial overviews, computer hardware & software, , DBMS, RDBMS and Telecommunication.
- 3. Conceptual System Design:** Define the problems, set systems objective, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, prepare the conceptual design report.
- 4. Detailed System Design:** Inform and involve the organization, aim of detailed design, project management of MIS detailed design , identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inform and involve the organization again, inputs outputs and processing, early system testing, software, hardware and tools, propose and organization to operate the system, document the detailed design, revisit the manager user.
- 5. Implementation, Evaluation and Maintenance of the MIS:** Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files, test the system, cut-over, document the system, evaluate the MIS, control and maintain the system. Pitfalls in MIS development .
- 6. Advanced Concepts in Information Systems:** Enterprise Resources Management(ERP), Supply Chain Management, C R M , Procurement Management System.
- 7. Applications:** Applications of MIS in Manufacturing sector, Service sector



B.E. Sem.VII [INFT]
Mobile Computing

SYLLABUS

Time : 3 Hrs.

Theory : 100 Marks
Term Work : 25 Marks
Oral : 25 Marks

- 1. Introduction:** Applications, A short history of wireless communication
- 2. Wireless Transmission:** Frequency for radio transmission, Signals, Antennas, Signal propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems.
- 3. Medium Access Control:** Motivation for a specialized MAC: Hidden and Exposed terminals. Near and Far terminals; SDMA, FDMA, TDMA: Fixed TDM, Classical Aloha, Slotted Aloha, Carrier sense multiple access, Demand assigned multiple access, PRMA packet reservation multiple access, Reservation TDMA, Multiple access with collision avoidance, Polling, Inhibit sense multiple access; CDMA: Spread Aloha multiple access.
- 4. Telecommunication Systems:** GSM: Mobile services, System architecture, Radio interface, Protocols, Localization And Calling, Handover, Security, New data services; DECT: System architecture, Protocol architecture; TETRA, UMTS and IMT-2000: UMTS Basic architecture, UTRA FDD mode, UTRA TDD mode
- 5. Satellite Systems:** History, Applications, Basics: GEO, LEO, MEO; Routing, Localization, Handover, Examples
- 6. Broadcast Systems:** Overview, Cyclic repetition of data, Digital audio broadcasting: Multimedia object transfer protocol; Digital video broadcasting
- 7. Wireless LAN:** Infrared vs. Radio transmission, Infrastructure and Ad hoc Networks, IEEE 802.11: System architecture, Protocol architecture, Physical layer, Medium access control layer, MAC management, Future development; HIPERLAN: Protocol architecture, Physical layer, Channel access control. Sublayer, Medium access control Sublayer, Information bases And Networking; Bluetooth: User scenarios, Physical layer, MAC layer, Networking. Security, Link management.
- 8. Wireless ATM:** Motivation for WATM, Wireless ATM working group, WATM services, Reference model: Example configurations, Generic reference model; Functions: Wireless mobile terminal side, Mobility supporting network side; Radio access layer: Requirements, BRAN; Handover: Handover reference model, Handover requirements, Types of handover, Handover scenarios, Backward handover, Forward handover; Location management: Requirements for location management, Procedures and Entities; Addressing, Mobile quality of service, Access point control protocol
- 9. Mobile Network Layer:** Mobile IP: Goals, assumptions and requirements, Entities and Terminology, IP packet delivery, Agent advertisement and discovery, Registration, Tunneling and Encapsulation , Optimizations, Reverse tunneling, Ipv6; Dynamic host configuration protocol, Ad hoc networks: Routing, Destination sequence distance vector, Dynamic source routing, Hierarchical algorithms, Alternative metrics
- 10. Mobile Transport Layer:** Traditional TCP: Congestion control, Slow start, Fast retransmit/fast recovery, Implications on mobility; Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction oriented TCP
- 11. Support for Mobility:** File systems: Consistency, Examples; World Wide Web: Hypertext transfer protocol, Hypertext markup language, Some approaches that might help wireless access, System architectures; Wireless application protocol: Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol, Wireless application environment, Wireless markup language, WML script, Wireless telephony application, Examples Stacks with Wap, Mobile databases, Mobile agents.

