Signals
Signal concept and function, unreliable signals, interrupted system calls, kill, raise, alarm, pause, sigsetjmp, sleep, abort, system functions

IPC
Pipes, popen and pclose functions, FIFOs, CoProcesses, Message Queues, msgget and msgsnd, msgctl functions, semaphores, semget, semctl, semop functions, shared memory, shmget, shmat, shmctl, shmdt functions

Main Reading
1. C and Unix Programming – Kerningham and Pike, Prentice Hall
2. Advanced Programming in the UNIX environment – W R Stevens, Pearson education Manuals

CS301 Database management Systems

Prerequisites: CS201, CS202

Course Contents:

Basic concepts (5%)
Database & Database Users, Characteristics of the Database Approach, Database Systems, Concepts & Architecture Data Models, Schemes & Instances DBMS Architecture of Data Independence, Data Base languages & Interfaces

Data Modelling using the Entity – Relationship approach (10%)

Relational Model, Languages & Systems (8%)
Relational Data Model & Relational Algebra Relational Model Concepts Relational Model Constraints Relational Algebra/Relational Calculus

SQL-A Relational Database Language Data (12%)
Definition in SQL. Views & Queries in SQL. Specifying Constraints & Indexes in SQL. A Relational Database Management System

Advanced SQL (10%)
Embedded SQL, Dynamic SQL, Triggers and Stored Procedures

Relational Data Base Design (12%)
Function Dependencies & Normalization for Relational Database Functional Dependencies
Normal forms based on primary keys (1NF, 2NF, 3NF, BCNF) Covers of Functional Dependencies, Canonical covers. Loss less join and Dependency preserving decomposition
algorithms.

Physical Database design and Query Optimization (12%)
Basic concepts, Indexing and Hashing, Measuring query cost and expression evaluation, Basics of query optimizations.

Recovery Techniques (10%)
Concept of a transaction, Recovery concepts, Recovery Techniques.

Concurrency Control   **(12%)**
Serialization Locking Techniques Time stamp ordering Granularity of Data items.

Overview of Network Data Model, Hierarchical Data Model and their DML's.   **(4%)**

Current trends in database   **(5%)**

Main Reading
  1. Korth, Silberchartz, " Database System Concepts" McGrawhill Publication.
  2. Elmasri and Navathe, " Fundamentals of Database Systems", Addison Wesley, New Delhi.
  3. Database Management Systems –R. Ramakrishnan, J.Gehrke – T.McGraw Hill

Supplementary Reading
  1. Desai B., " An Introduction to Database Concepts", Galgotia Publications, New Delhi.
  2. Rob,Coronel, "Database Systems (Design, Implementation and Management)"
  3. Date C. J. , " An Introduction to Database Systems", Publication House, New Delhi.

CS302   Computer Communications Network

Prerequisites: CS 102, CS201, CS202.

Course Contents:

Introduction   **(5%)**
Uses of computer networks. Types of computer networks and network topologies . Layered protocols and OSI
reference model. Interfaces and services, Connection oriented and connectionless services. Service primitives,
Relationship of services to protocols. TCP/IP reference models.

Physical Layer Fundamentals of communication theory: **(15%)**
Impairment to Transmission, Bandwidth limited signals, Channel speed and bit rate, Maximum data rate over
noiseless and noisy channel, Baud rate and Bit rate, Shift keying - FSK, PSK, ASK. QAM. Pulse code
modulation, Digital signal encoding, Multiplexing data channels :FDMA,TDMA and CDMA. Guided
Transmission Media, Wireless Transmission. Synchronous, Asynchronous and Isochronous transmission.
Packet, Message and Circuit switching. Telecommunication Network and Telecommunication Data
Hierarchies. Examples: Modem, DSL.

Data Link Layer   **(15%)**
Framing, Error control and Flow control, Error detection and correction. Hamming code and Cyclic Redundancy
Check., Sliding Window protocols: Go back n and Selective Reject. HDLC: HDLC Options, Frame format and
transmission process.

Medium Access Control Sublayer   **(15%)**
IEEE LAN standards. ALOHA, CSMA/CD, CSMA/CA. IEEE 802.3 protocol: Switched Fast & Gigabit
Ethernet. Wireless Network: IEEE 802.11, IEEE 802.16, Bluetooth. Repeaters, Switches and Bridges.
Transparent (Spanning tree) and Source routing Bridges. LLC protocol – IEEE 802.2.

Network Layer   **(20%)**
Virtual Circuit vs. Datagram Subnet. Store and Forward mechanism. Routing Algorithms: Optimality Principle,
Shortest Path Routing, Unicast Routing: Distance Vector Routing, Link State Routing. Broadcast Routing:
Flooding, Reverse path forwarding. Congestion Control. Providing Quality of Service (QOS).