COMPUTER NETWORKS SYLLABUS

Module 1: Networking Principles and Layered Architecture

- Data Communications and Networking
- A Communications Model
- Evolution of Networks
- Network Requirements and Applications
- Network Topology
    - Line Configuration
    - Data Flow
- Protocols and Standards
- Network Models
    - OSI Model
    - TCP/IP Model

Module 2: Circuit and Packet Switching

- Switched Communications Networks
- Circuit Switching
- Packet Switching
- Comparison of Circuit Switching and Packet Switching
- Implementing Network Software
- Networking Parameters
    - Transmission Impairment
    - Data Rate
    - Performance

Module 3: Data Link Layer

- Error Detection and Correction
    - Hamming Code
    - CRC
    - Checksum
- Flow Control Mechanisms
    - Sliding Window Protocol
    - Go-Back-N
    - Selective Repeat
- Multiple Access Protocols
    - Aloha
    - Slotted Aloha
    - CSMA
    - CSMA/CD
- IEEE Standards
    - IEEE 802.3 (Ethernet)
    - IEEE 802.11 (WLAN)
- RFID
- Bluetooth Standards

Module 4: Network Layer

- IPv4 Address Space
    - Notations
    - Classful Addressing
    - Classless Addressing
- Network Address Translation (NAT)
- IPv6 Address Structure
- IPv4 and IPv6 Header Formats

Module 5: Routing Protocols

- Routing Protocols
    - Link State
    - Distance Vector
- Implementation
- Performance Analysis
- Packet Tracer

Module 6: Transport Layer

- TCP and UDP
- Congestion Control
    - Effects of Congestion
    - Traffic Management
    - TCP Congestion Control
    - Congestion Avoidance Mechanisms
    - Queuing Mechanisms
- QoS Parameters

Module 7: Application Layer

- Application Layer Overview
- Domain Name System (DNS)
- Case Studies
    - FTP
    - HTTP
    - SMTP
    - SNMP