

## **COMPUTER SCIENCE (CC -10): Computer Networks Theory: 60 Lectures**

### **1. Introduction to Computer Networks**

(8 Lectures)

Network definition; network topologies; network classifications; network protocol; layered network architecture; overview of OSI reference model; overview of TCP/IP protocol suite.

### **2. Data Communication Fundamentals and Techniques**

(10 Lectures)

Analog and digital signal; data-rate limits; digital to digital line encoding schemes; pulse code modulation; parallel and serial transmission; digital to analog modulation-; multiplexing techniques- FDM, TDM; transmission media.

### **3. Networks Switching Techniques and Access mechanisms**

(10 Lectures)

Circuit switching; packet switching- connectionless datagram switching, connection-oriented virtual circuit switching; dial-up modems; digital subscriber line; cable TV for data transfer.

### **4. Data Link Layer Functions and Protocol**

(10 Lectures)

Error detection and error correction techniques; data-link control- framing and flow control; error recovery protocols- stop and wait ARQ, go-back-n ARQ; Point to Point Protocol on Internet.

### **5. Multiple Access Protocol and Networks**

(5 Lectures)

CSMA/CD protocols; Ethernet LANS; connecting LAN and back-bone networks- repeaters, hubs, switches, bridges, router and gateways.

### **6. Networks Layer Functions and Protocols**

(6 Lectures)

Routing; routing algorithms; network layer protocol of Internet- IP protocol, Internet control protocols.

### **7. Transport Layer Functions and Protocol**

(6 Lectures)

Transport services- error and flow control, Connection establishment and release- three-way handshake.

### **8. Overview of Application layer protocol**

(5 Lectures)

Overview of DNS protocol; overview of WWW & HTTP protocol.

## **COMPUTER SCIENCE LAB (CC-7): Computer Networks Lab**

### **Practical: 60 Lectures**

1. Simulate Cyclic Redundancy Check (CRC) error detection algorithm for noisy channel.
2. Simulate and implement stop and wait protocol for noisy channel.
3. Simulate and implement go back n sliding window protocol.
4. Simulate and implement selective repeat sliding window protocol.
5. Simulate and implement distance vector routing algorithm
6. Simulate and implement Dijkstra algorithm for shortest path routing.