

## **CO 34007: COMPUTER NETWORKS**

### **Theory:**

1. Introduction to computer networks & their uses, Different topologies. ISO-OSI model: Layered Architecture, Peer-to-Peer processes and encapsulation, Function and Services of OSI layers; The Physical layer: Digital Signals, Transmission Impairments and Maximum data rate of a channel, Shennons theorem, Nyquist theorem. Transmission media: Guided and Unguided medias. Circuit, Packet and Message switching, virtual Circuit. Introduction to ISDN & its components.
2. The data link layer: Design issues & function, Error detection & correction, Forward error correction Versus Retransmission, Hamming code & CRC codes, Framing: Fixed size and Variable size Frame, Bit stuffing and Byte stuffing. Data link layer protocols: Simplest, Stop and Wait, Sliding window protocols, PPP, SLIP, HDLC. The medium access sublayer: Static and Dynamic Channel Allocation, Protocols: ALOHA Protocol, CSMA (CSMA/CD, CSMA/CA), Collision Free Protocol- Bit Map.
3. IEEE 802 standards for LANs (IEEE 802.3, IEEE 802.4, IEEE 802.5), LAN Devices: HUB, Switches- Learning, Cut-Through and store and forward switches, Bridges: IEEE 802.x to IEEE 802.y, Spanning Tree, Remote Bridge. Internetworking Devices: Routers & gateways. The network layer: Design issues and functions, Internal organization (Virtual Circuit & Datagrams).
4. Routing algorithms: Shortest path routing, Flooding, LSR, Distance Vector Routing, Hierarchical Routing. Introduction to TCP/IP Protocol stack: Protocol Architecture, Classful IP addressing, ARP, RARP, IP Datagrams with options and its delivery, ICMP.
5. Subnet, Supernet, CIDR. Transport Layer: Congestion control, Load Shedding, Jitter control, addressing and multiplexing, Connection establishment and connection release, flow control. Application layer: Introduction to DNS and Email.

### **Text Books**

1. Tanenbaum A. S., “Computer Networks”, Pearson Education, 4<sup>th</sup> edition, 2003.
2. Behrouz A Forouzan, “Data communication and networking”, TMH publication, 4<sup>th</sup> edition, 2006.
3. Comer, “Internetworking with TCP/ IP Vol-1”, Pearson education, 4<sup>th</sup> Edition, 2002.

### **Reference Books**

1. Peterson & Davie, “Computer Networks”, Thomson Learning.
2. W. Richard Stevens, “TCP/IP Illustrated Vol-1 ” Addison-Wesley.
3. Craig Zacker, “Networking The Complete Reference”, TMH, 2001.