

# Computer Networks

ICNE 532C

## Introduction

Introduction to Computer Networks, OSI & TCP/IP Reference Models, Physical Layer.

## Data Link Layer

Framing, Error Control, Error Detection and Correction, Flow Control. Data Link Protocols: Simplex Stop-and-Wait Protocol, Sliding Window Protocols, One-Bit Sliding Window Protocol, Go-Back-N and Selective Repeat, HDLC, PPP Medium Access Control Sublayer, The Channel Allocation. Multiple Access Protocols: ALOHA, Carrier Sense Multiple Access Protocols, IEEE 802.x Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet, Wireless LANs - IEEE 802.xx , Bluetooth, RFID, Bridges, Virtual LANs.

## Network Layer

Design Issues, Store-and-Forward Packet Switching, Virtual-Circuit and Datagram Networks, Routing: Shortest Path Algorithms, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks, Congestion Control: Approaches, Traffic-Aware Routing, admission Control, Traffic Throttling, load Shedding. Quality Of Service: Application Requirements, Traffic Shaping, Packet Scheduling, Admission Control, Integrated Services, Differentiated Services, The IPv4 and v6, IP Addressing, Internet Control Protocols, Label Switching and MPLS, OSPF, BGP, Internet Multicasting, Mobile IP.

## Transport Layer

Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Congestion Control Algorithms UDP, Remote Procedure Call, TCP, Delay Tolerant Networks.

## References

- [1] *Computer Networking: A Top-Down Approach Featuring the Internet*, James F. Kuross, Keith W. Ross., 6<sup>th</sup> Edition
- [2] *Computer Networks* , Andrew S. Tanenbaum, 5<sup>th</sup> Edition