

Semester II

CSCH 451 - Advanced aspects of Computer Networks

UNIT I

Internetworking: Simple Internetworking (IP): Service Model, Global Addresses, Datagram Forwarding in IP, Address Translation (ARP), Host Configuration (DHCP), Error Reporting (ICMP), Virtual Networks and Tunnels , Routing: Network as a Graph, Distance Vector (RIP), Link State (OSPF), Metrics, Routing for Mobile Hosts, Global Internet: Subnetting, Classless Routing (CIDR), Interdomain Routing (BGP), Routing Areas , IP Version 6 (IPv6), Multicast: Link-State Multicast, Distance-Vector Multicast, Protocol Independent Multicast(PIM), Multiprotocol Label Switching (MPLS): Destination-Based Forwarding, **End-to-End Protocols:** Simple Demultiplexer (UDP), Reliable Byte Stream (TCP), Remote Procedure Call.

(16 hours)

UNIT II

Congestion Control and Resource Allocation : Issues in Resource Allocation: Network Model, Taxonomy, Evaluation Criteria, **Queuing Disciplines:** FIFO, Fair Queuing, , TCP Congestion Control: Additive Increase/Multiplicative Decrease, Slow Start, Fast Retransmit and Fast Recovery, Congestion-Avoidance Mechanisms: DECbit, Random Early Detection (RED), Source-Based Congestion Avoidance, Quality of Service, **End-to-End Data :** Presentation Formatting, Data Compression.

(16 hours)

UNIT III

Network Security : Cryptographic Algorithms, Security Mechanisms, Example Systems, Firewalls, **Applications :** Name Service (DNS), Traditional Applications, Multimedia Applications, Overlay Networks.

(16 hours)

TextBooks:

- (1). "COMPUTER NETWORKS, A Systems Approach", Larry L. Peterson & Bruce S. Davie, Third Edition, Morgan Kaufmann Publishers, 2003
- (2). "Computer Networks" , Andrew S. Tanenbaum David J. Wetherall, Fifth Edition, Pearson Education Limited 2014
- (3). "A Professional's Guide to Data Communication in a TCP/IP World", E. Bryan Carne, Artech House Inc, 2004