

McEng 2282– Computer Networks

Course Number: McEng 2282	Credit Hours: 3
Course Title: Computer networks	Contact Hours: 2 Lecture hrs and 2 Lab. hrs

Course Outline:

UNIT I DATA COMMUNICATION CONCEPTS

Digital & Analog, Parallel & serial, Synchronous & Asynchronous, Simplex, Half duplex & Full Duplex, Computer Networks, introduction, Network topology, wired network Vs wireless network, classification of computer N/W's, LAN, MAN, WAN, ISO / OSI model, transmission media, coaxial cable, fiber optics.

UNIT II N/W REFERENCE MODELS, PROTOCOL SUITS AND DATA LINK LAYER

Need of protocols & their significance in networking, OSI reference model, TCP/IP reference model, comparison of OSI & TCP/IP Reference models. Networking Hardware: Ethernet cabling, NIC, Repeater, Router, Bridges, Switches, Transceivers, hubs, Cable modems.

Error, detection and correction, parity, LRC, CRC, Hamming code, Flow Control and Error control, stop and wait, go back, N ARQ, selective repeat ARQ, sliding window, HDLC, LAN, Ethernet IEEE 802.3, IEEE 802.4, IEEE 802.5, IEEE 802.11

UNIT III SWITCHING TECHNOLOGIES AND LAN STANDARDS

Circuit switching, message & packet switching, Channel allocation methods, ALOHA protocols, Pure ALOHA, Slotted ALOHA, IEEE standard 802 for LANS Ethernet, CSMA/CD, Token Ring, Token Bus, & their frame format, FDDI. Internetworks, packet switching and datagram approach, IP addressing methods, Subnetting, routing, distance vector routing, link state routing, routers.

UNIT IV DATA LINK & NW LAYER

Services provided by N/W layer, Framing, Data link control: Flow control, Error detection, HDLC & SDLC, Concept of Routing & congestion control. Transport layer Protocols like TCP, user datagram protocol (UDP), connection oriented transport protocol, transmission control protocol (TCP) services, Duties of transport layer , multiplexing, demultiplexing, sockets, congestion Control.

UNIT V N/W PROTOCOLS & TRADITIONAL APPLICATION LAYERS

The IP layers and functions, addressing and routing, Internet user services, E-Mail, www, Telnet, FTP, HTTP, SMTP. Broad Band Networks: ISDN Evolution, structures, Limitation Broadband, ISDN, Asynchronous transfer mode (ATM), SONET.

Pre-Requisites: McEng2035 – Intro. to Computer Programming

Co-Requisite:

Textbook:

1. Forouzan, “Introduction to Data communications and Networking”, Tata McGraw-Hill, 3rd Edition, 2004.
2. William Stallings, “Data and Computer communications”, Maxwell Macmillan International Editions, 2nd Edition.
3. Andrew S. Tanenbaum, “Computer Networks”, Prentice Hall of India, 3rd edition, 1998.
4. Balaji Kumar, “Broad band Communication”, McGraw-Hill, 1996.

References:

1. Larry L.Peterson and Bruce S.Davie, “Computer Networks A system approach”, Elsevier publications, 3rd Edition.
2. James.F.Kurose and Keith W.Ross, “Computer Networking: A Top-Down Approach Featuring the Internet”, Pearson Education, 2003.

Teaching Methods:

- Lectures supported by tutorials,
- Laboratory exercises and
- Assignments.

Laboratory Exercises:

Learning IEEE standards and simple case studies on integrating hardware systems with software systems.

Attendance Requirement:

- Minimum of 75% attendance during lecture hours, and

- 100% attendance during practical laboratory sessions, except for some unprecedented mishaps.

Evaluation:

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| • Assignments | 10%, |
| • Laboratory | 10%, |
| • Mid-semester Examination | 30%, and |