



EE453-Telecommunication Networks (Required Course)

Code and Name: EE453 Telecommunication Networks

Credit Hours: 3 (Lecture: 3, Tutorial: 1)

Textbook:

- *Computer Networking: A Top-Down Approach*, Kurose, J. and Ross, K., sixth Edition, Addison-Wesley, 2012.

Other References:

- Andrew S. Tanenbaum and David J. Wetherall, *Computer Networks*, (5th Edition), Pearson, 2011.
- Dimitri Bertsekas and Robert Gallager, *Data Networks*, (2th Edition), (1992), Prentice Hall,
- William Stallings, *Data and Computer Communications*, (9th Edition), Prentice Hall; 9 edition (August 13, 2010).
- Gurdeep S. Hura and Mukesh Singhal, *Data and Computer Communications: Networking and Internet Networking*, Publisher: CRC Press; (1th Edition) (March 28, 2001).

Course Description:

This course introduces students to the networking field. Topics include network terminology and protocols, OSI model, cabling, router programming, Ethernet, IP addressing, and network standards. Upon completion, students should be able to perform tasks related to networking mathematics, terminology, and models, media, Ethernet, subnetting, and TCP/IP Protocols.

Pre-requisites: EE 351.

Co-requisites: None

Course Learning Outcomes:

With relation to ABET Student Outcomes (SOs: 1-7)

1. Apply Mathematical, Scientific Principles in IP Addresses protocol to formulate telecommunication model. (1)
2. Execute calculation correctly in segmentations and subnetting and congested network problems. (1)
3. Developing a solution that include realistic constraints for network protocol. (2)
4. Solve practical problems logically using subnetting and segmentation concept. (1)
5. Oral Presentation in different topics in Communication network. (3)
6. The use of graphs, tables and diagram to solve real and Conceptual Scenario in the network. (3)

Topics to be covered:

- Introduction to Computer Networks: Internet; Network Concepts; Protocols; Network Security
- Application Layer: Web: HTTP; File Transfer: FTP; Electronic Mail: SMTP; Domain Name Service: DNS; Peer-to-Peer Applications; Socket Programming
- Transport Layer: Multiplexing and Demultiplexing; Connectionless Transport: UDP; Reliable Data Transfer; Connection-Oriented Transport: TCP; Flow/Congestion Control
- Network Layer: Virtual Circuit and Datagram Networks; Routers
- Link Layer: Error-Detection and -Correction Techniques: CRC; Multiple Access: MAC, ARP; Ethernet; Link-Layer Switches: VLAN; Link Virtualization: MPLS; Internet Protocol: IP; Routing Algorithms; Routing Protocols: RIP, OSPF, BGP; Broadcast and Multicast
- Physical Layer: Data and Signals; Digital and Analogue Data; Encoding: Bandwidth Utilization

Grading Policy:

The grading for the course are 60% coursework and 40% Final Exam. The coursework consists of two Midterm Exams, where each midterm exam is worth 20%. It also includes quizzes, homework, and projects for the remaining 20% that is modified by the course instructor.

