

CNT 4104 Introduction to Data Communications

Credits: 3

Text book, title, author, and year: Data Communications and Networking, 4th ed., Behrouz A. Forouzan, McGraw-Hill, 2006, (ISBN: 0073250325).

a. **Supplemental materials:** none.

Specific course information

- a. **Catalog description:** This course provides an introduction to fundamental concepts in the design of data communications networks, networking protocols, and applications. Topics to be covered include network architectures, physical media, protocols for data link, network, transport, and application layers. Students acquire hands on experience programming TCP/IP network applications and using an packet-driven network simulator.
- b. **Prerequisites:** COP 3530
- c. **Required, elective, or selected elective:** elective

Specific goals for the course

- a. **Specific outcomes of instruction:**
 1. Demonstrate understanding of the layered architecture of communication protocols
 2. Explain the fundamentals of the physical layer, data link layer, and medium access control
 3. Demonstrate understanding of the IP addressing and networking architecture
 4. Explain the working of the TCP and UDP protocols
 5. Simulate network applications on complex network topologies and analyze application performance

Brief list of topics to be covered:

- Introduction
- Network Models
- Data and Signals
- Digital & Analog Transmission
- Multiplexing and Switching
- The OPNET IT Guru Network Simulator
- Link Layer Basics: Error Detection and Correction, Multiple Access, Data Link Control
- Wired LANs: Ethernet
- Wireless LANs: IEEE 802.11
- Connecting LANs, Backbone Networks, and VLANs
- Network Layer: logical Addressing and the Internet Protocol (IP)
- Network Layer: Address Mapping and Error Reporting
- Network Layer: Delivery, Forwarding, Routing
- Transport Layer: UDP and TCP
- DNS and WWW