Listed below are the course outcomes. These outcomes will be assessed by assigning homework, a midterm, and a final.

1. Communications Networks and Services
   1.1. Understand the difference between packet and circuit switching
   1.2. Understand the Internet
   1.3. Understand the RFC process
   1.4. Understand the difference between transmission delay and propagation delay
   1.5. Understand the role of regulations
   1.6. Understand the advantages and disadvantages of standards
   1.7. Be able to describe a history of communications networks
   1.8. Define a protocol
   1.9. Understand the client/server model
   1.10. Understand the key factors of technology, regulation, market, and standards

2. Applications and Layer Architecture
   2.1. List and describe the layers in the OSI model
   2.2. List and describe the layers in the TCP/IP model
   2.3. Describe the difference between TCP and UDP
   2.4. Understand the idea of encapsulation
   2.5. Understand socket programming
   2.6. Understand port numbers

3. Digital Transmission Fundamentals
   3.1. Understand the difference between analog and digital. Describe repeaters, digital regenerators, and equalizers
   3.2. Be able to calculate the Nyquist sampling rate, Nyquist signaling rate, and the Shannon channel capacity
   3.3. Understanding sampling, quantizing, quantization error, and quantizer SNR and be able to calculate any parameters related to sampling
   3.4. Understand PCM
   3.5. Understand modems, ASK, FSK, PSK, QAM, and constellations
   3.6. Understand UTP
   3.7. Describe how ADSL works
   3.8. Describe how cable modems work
   3.9. Understand fiber optics and WDM
   3.10. Be able to calculate parity, 2D parity, CRC, and the Internet checksum
4. Circuit Switching
   4.1. Understand multiplexing, FDM, TDM, and WDM
   4.2. List the speeds of DS1, DS3, E1, E3
   4.3. Understand SONET, STS, OC, and how line rates are defined
   4.4. Be able to describe UPSR and BLSR
   4.5. Understand circuit switches, the CLOS switch, and TSI
   4.6. Describe the telephone network, LATA, LEC, IXC, local loop, echo, hybrid,
        digital cross-connect (DCC)
   4.7. Describe ISDN, BRI, and PRI
   4.8. Describe SS7, SSP, STP, and SCP
   4.9. Be able to calculate blocking probability with Erlang-B
   4.10. Describe the cellular phone system, forward and reverse channels, cells,
        MTSO, and BSS

5. Medium Access Control Protocols and LANs
   5.1. Describe MAC protocols and collisions
   5.2. Understand slotted aloha, aloha, CSMA, and CSMA/CD
   5.3. Be able to calculate the maximum efficiency of a protocol such as CSMA/CD
   5.4. Describe Ethernet, 10BaseT, 100BaseT, Gigabit Ethernet, and 10 Gbps Ethernet
   5.5. Describe the difference between a hub, bridge, switch, and router
   5.6. Describe a VLAN