

1. ECE 456: Computer Networks
2. 4 credits: 2-75 minute lecture sessions/week, weekly lab time assigned
3. Anura P Jayasumana
4. Data Communication and Networking, Forouzan. B. A. 2013.
5. Course Information
 - a. Circuit/packet switching protocols, LAN/MAN, TCP/IP, error correction, wireless LANS, mobile networks
 - b. Prerequisites: CS163 with a C or higher or CS164 with a C or higher or (CS155 with a C or higher; CS156 with a C or higher; CS157 with a C or higher); ECE 251 with a C or higher; ECE 303 with a C or higher or STAT 303 with a C or higher
 - c. Required: Computer Engineering
Selected Elective: Electrical Engineering
6. Goals for the Course
 - a. Course Learning Objectives
 - i. Describe and explain the Internet architecture and its features that enable it to evolve and grow in size, speed and complexity while enabling a wide range of devices to seamlessly communicate with each other
 - ii. Examine and assess the basic communication technologies used in the global information infrastructure and their fundamental limits
 - iii. Develop network protocols and distributed Internet based applications using basic network programming concepts
 - b. Student Outcomes
 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
 2. An ability to apply the engineering design process to produce solutions that meet specified needs with consideration for public health and safety, and welfare, as well as global, cultural, social, environmental, and economic factors
 4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
 7. An ability acquire and apply new knowledge as needed, using appropriate learning strategies
7. Topics Covered
 - Circuit switching and packet switching
 - Physical layer – link technologies, encoding
 - Logical Link Control (LLC) – framing, error detection & correction, flow control,

Medium Access Control (MAC) - fixed, random and demand assignment; Sonet/SDH,
Wired and wireless networks; IEEE 802.X standards
Cellular and wired phone networks
Internet Protocol (IP) – addressing, service model, routing
Transport Protocols – TCP/UDP
Network programming - socket systems calls
Sensor networking
Future trends in networking