CSE 461 Introduction to Computer-Communication Networks

Credits
4.0 (3 hrs lecture, 1hr section)

Lead Instructor
Arvind Krishnamurthy

Textbook

- *Computer Networks*, Tannenbaum

Course Description
Computer network architectures, protocol layers, network programming. Transmission media, encoding systems, switching, multiple access arbitration. Network routing, congestion control, flow control. Transport protocols, real-time, multicast, network security.

Prerequisites
either CSE 326 or CSE 332; either CSE 303 or CSE 333.

CE Major Status
Selected Elective

Course Objectives
To provide students with an understanding of how to construct large-scale computer networks. This includes an appreciation of the fundamental problems that arise in building networks, the design principles that are of proven value, and the common implementation technologies that are in use today.

ABET Outcomes
(a) an ability to apply knowledge of mathematics, science, and engineering
(b) an ability to design and conduct experiments, as well as to analyze and interpret data
(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
(e) an ability to identify, formulate, and solve engineering problems
(i) a recognition of the need for, and an ability to engage in life-long learning
(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

Course Topics

- This course introduces the basics of networking, ranging from transmitting bits over wires to the Web and distributed computing. We focus on the inter-networking issues in-between these two extremes. We will cover protocol layering in general and the following topics in particular:
    - framing
    - error correction
    - packet and circuit switching
    - multi-access protocols (Ethernet)
    - queuing
    - addressing and forwarding (IP)
    - distance vector and link state routing
    - reliable transport
    - congestion control (TCP)
    - security