

ECE 465/565
Computer Networks and Protocols
Fall 2005

Instructor: Dr. Think Nguyen

Credits: 4

Meeting Time: TR: 8-9:50 AM

Location: Owen 103

Office Hour: TR: 1-2 PM

Text: Kurose and Ross, Computer Networking: A Top-Down Approach Featuring the Internet, **Third edition**, Addison Wesley.

Website: <http://web.engr.oregonstate.edu/~thinkq/teaching/ece465/fall05/fall05.html>

Course Description:

This course covers the basic concepts of networking layers and their functionalities. These include network architectures, routing algorithms, and link and transport protocols.

Prerequisites:

By course: ECE 375, CS 261, or instruction's permission.

By topic: Basic knowledge of computer organization, programming skills.

Course Learning Objectives:

Both graduate/undergraduate students must demonstrate the ability to:

1. Analyze the optimum segment size which leads to minimum delay in sending a large data file. (ABET Outcomes: a, c, k)
2. Analyze the latency of sending an object as a function of RTT window size (static and dynamic). (ABET Outcomes: a, c, k)
3. Analyze the distance vector algorithm. (ABET Outcomes: b, c, j, k)
4. Analyze the link-state algorithm. (ABET Outcomes: a, j)
5. Analyze the Carrier Sense Multiple Access with Collision Detection (CSMA/CD). (ABET Outcomes: b, c, j, k)
6. Design a triple duplicate ACKs. (ABET Outcomes: b, c, j, k).

Graduate student must demonstrate the ability to

1. Design and implement a sophisticated, reliable transport protocol. (ABET Outcomes: b, c, j, k).

Topics:

- Introduction to computer networks and the Internet
- Basic probability theory
- Application layer
 - http

- FTP
- SMTP
- DNS
- P2P
- Socket programming
- Transport Layer
 - Principles of reliable transport
 - UDP
 - TCP
 - Congestion control
- Network Layer and Routing
 - Routing principles
 - IP
 - Routing in the Internet
- Link Layer and Local Area Networks
 - Error detection and correction
 - Multiple access protocols and LANs
 - LAN address and ARP
 - Ethernet
 - IEEE 802.11 LANs (Wireless)
- Physical Layer
 - Router design overview
 - Optical communication overview

Grading:

Assignments (written and programming assignments)	40%
Midterm 1	15%
Midterm 2	15%
Final	30%