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Course URL: http://www.engr.colostate.edu/EE456/EE456_Sp08/

Objectives:

Today's global information infrastructure consists of various systems and devices interconnected via the Internet. Where information resides has become less important compared to ubiquitous and quick availability of information. The quality of service experienced by a user or an application depends on the underlying network hardware (e.g., links, routers), protocols (e.g., TCP/IP) and characteristics (e.g., network traffic, access times and interference). Internet is a dynamically evolving systems held together by a set of protocols, in contrast to many other systems (e.g., microprocessors, workstations) that are designed by a close-knit group of designers. EE 456 introduces computer and communication networking principles and technologies that make such a complex global information infrastructure possible.

Outcomes:

Students will have a general knowledge on how the Internet works and be able to develop network protocols and applications using basic network programming concepts.

Prerequisites: ECE251, ECE303, and programming skills (ex. CS160 or CS155, CS156, CS157)

Topics:

1. Introduction
2. Circuit Switching and Packet Switching - Sonet/SDH
3. Layered Architectures - ISO-OSI, TCP/IP
4. Physical Layer – Link Technologies, Encoding
5. Data Link Layer – Logical Link Control, Framing, Error Detection & Correction
6. Medium Access Control (MAC) - Local-Area Networks, IEEE 802.X Standards
7. Internet Protocol (IP) – Addressing, Service Model, Routing
8. Transport Protocols – TCP/UDP, Socket Systems Calls
9. Sensor Networking – An Introduction
10. Future Trends in Networking

Text: Communication Networks, A. Leon-Garcia, I. Widjaja, McGraw Hill, 2004 (Required).

Due to the wide range of topics, there is no single text that covers all of them. Additional reading material will be made available.

Grading:	Homework	25%
	Minute Papers	10%
	Presentation	10%
	Exam	25%
	Lab Assignments	30%

+/- Grading will be used.

Homework: You are expected to turn in solutions to all the homework problems. However, only a subset of problems in each assignment will be graded; the subset may vary by assignment and by student.

Minute paper: A minute paper is a short write-up about each lecture: What are the most significant things you learned in the lecture? Why is it significant? What question is uppermost in your mind at the end of the lecture? Be creative!! Length of the paper is not critical. A typical minute paper would be ~150 to 200 words. Since each minute paper is based on a lecture, you must not submit one for a lecture that you did not attend. The minute paper for a given lecture must be submitted prior to the next lecture. Follow the link from course web page to submit minute papers. Up to 20% of the minute papers may be skipped without a penalty.

Presentation: A 20-minute presentation is expected covering a pre-approved topic or a project.

Exam: There will be one exam, which will either be a comprehensive final or an in-class exam covering selected topics depending on overall performance in homework and lab assignments.

Labs: The lab will be run on an open-hour basis. E-mail a well commented source code for the program and demonstrate the lab to the TA by the due date. The lab assignments are an important part of this course. You must pass each lab assignment with a score of 60% or better to pass the course. Discussions with colleagues are encouraged on different approaches to solving the assignments and to overcome difficulties. However, the program must be your own work, and no collaborative efforts are acceptable in developing the program, except in case of group assignments, for which any collaboration has to be limited to the group. *Under no circumstances should you copy a program or a segment of a program from another source. Providing code for use by someone else or using someone else's code in any form is academic fraud, and will be dealt with harshly. It is your responsibility to ensure that the code you write for the assignments is not accessible to others.*