Course Objective: To study the basic concepts of communication networks, protocols and their performance.

Instructor: Henry Owen
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Caution: To be successful in this class you will need to read the textbook. Although the lectures follow the textbook closely, students who do not read the text book (and incorrectly assume they got all the material needed just from the lectures) typically do not earn good grades. Students who try to read most of the material all at once instead of on a regular basis to prepare for class typically do not earn good grades.

Text

Grading ECE3076:
- Homework 10%
- Test 1 30%
- Test 2 30%
- Final 30%

**CS students must complete both programming assignments or their course letter grade is reduced by one letter grade.**

Homework not turned in by the due date/time will be penalized by 10% per day. Homework is to be turned in by uploading a pdf file (not word, not text, not rtf) to the canvas web site.

Test will be closed book and closed notes but you are allowed one side of an 8.5 x 11 inch hand written cheat sheet.

Class Web Site:
https://canvas.gatech.edu/

Academic Honesty: Follow the Georgia Tech Honor Code - http://www.deanofstudents.gatech.edu/. **You MAY NOT use homework solutions that others have developed as the basis for your solutions. Copying/using online solution manual answers is cheating.** However, you ARE allowed to discuss the problems (and their solutions) with fellow students in the class this semester and with the instructor. All conduct in this course will be governed by the Georgia Tech honor code.
Class Attendance: Missing a “large” number of classes will lower your course grade since the class curve at the end of the semester will only be applied only to those that attend class. If you miss an exam without notice prior to the start of the exam, you will receive a zero for that exam.

OUTLINE
Introduction
- network edge
- end systems, access networks, links
- network core
- packet switching, circuit switching, network structure
- delay, loss, throughput in networks
- protocol layers, service models

Application Layer
- Web and HTTP
- Electronic mail
- Domain Name System
- video streaming and content distribution networks
- Socket programming with UDP and TCP*

Transport Layer
- multiplexing and demultiplexing
- connectionless transport: UDP
- principles of reliable data transfer
- connection-oriented transport: TCP
- principles of congestion control
- TCP congestion control

Network Layer: The Data Plane
- data plane
- control plane
- Router architecture
- IP: Internet Protocol
- Generalized Forward and SDN

Network Layer: The Control Plane
- routing protocols
- intra-AS routing in the Internet: OSPF
- routing among the ISPs: BGP
- The SDN control plane

Link Layer and LANs
- error detection, correction
- multiple access protocols
- LANs
- data center networking
- day in the life of a web request

Wireless Networking
- Wireless links, characteristics
- IEEE 802.11 wireless LANs (“Wi-Fi”)
Student-Faculty Expectations Agreement

At Georgia Tech we believe that it is important to strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectation that you can have of me and that I have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, I encourage you to remain committed to the ideals of Georgia Tech while in this class.

Accommodations for Students with Disabilities

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.