CS 450: Introduction to Networking

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Course Description

This is an introductory course on computer networks. The course covers some of the key protocols in each layer of the protocol stack in a top-down fashion: application layer (HTTP, DNS, SMTP), transport layer (TCP, UDP), network layer (IP), and link layer (802.3, 802.11). This is a hands-on, programming-heavy course. The course is structured with a series of programming assignments, a mid-term exam, and a final exam.

Textbook

Computer Networking: A Top-Down Approach by Kurose and Ross, 6th or 7th edition [link]

Topics covered (tentative)

- TCP/IP layering model of the Internet
- Domain Name Services (DNS)
- Networking APIs for application developers
- Network performance - throughput, delay and packet loss
- TCP - Reliability and Congestion Control
- IPv4/IPv6 Addressing / Routing
- Inter/intra domain routing protocols
- Network address translation
- Mobility and the Internet
- Multicast and Anycast mechanisms
• Physical layer: modulation and coding

Prerequisites

Prior programming experience in any language is a must. Prior experience with python is a plus. Because this is a programming-heavy course, please be prepared to write and debug a lot of code.

Grading

The course uses relative grading; Graduate and undergrad students are graded separately. The (tentative) weights of the different components are as follows:

• Programming assignments: 40%
• Mid-term exam: 25%
• Final exam: 35%

Late submission policy for programming assignments

There will be about six to eight assignments that are spread out over the semester.

• There is a 50% penalty for submissions that are late but within 24 hours of the deadline; you forfeit 100% of the grade after 24 hours.

• If there is a legitimate reason for missing a deadline, please contact the instructor.

Class participation

Class participation is incredibly important! There is a bonus 2% for exceptional participation based on the discretion of instructor and TA. Exceptional participation includes answering questions in Piazza, reporting errors in assignments, asking good questions in class, and contributing test-cases and scripts for the common good.

Academic Integrity

We encourage active discussion with peers. However, there is a red line: copying code, in any form, is plagiarism. If you don’t know how your own code works, then there is a problem. Cite your sources in all your turn-ins to be safe. When in doubt, please consult with the instructor or the TA.