

CS 4254 Network Architecture and Programming

Fall 2020

1 Course description

We'll study how the Internet really works, and how one builds applications on top of it. The course will be hands-on. We'll cover the fundamentals of computer networks, including network architectures, network topologies, network protocols, layering concepts, communication paradigms (point-to-point vs. multicast/broadcast, connectionless vs. connection oriented), and networking APIs (sockets).

We will cover the following topics:

- High-level view of the Internet: Internet core, access networks
- Measuring and understanding network performance
- Network layering
- Socket programming
- Application layer: Web, Email, DNS
- Transport layer: TCP, UDP
- Network layer: IPv4, IPv6, NAT, routing protocols
- Link layer: local area networks, switching, spanning tree protocol, VLANs
- Network security basics

2 Textbook

Computer Networking: A Top-Down Approach, Global Edition by Keith Ross, and James Kurose

3 Prerequisites

CS 3214 (Min grade of C)

4 Grading

Final grade will be based on the following components:

- Programming projects
- Homework assignments
- Midterm, and final exams