Syllabus - Introduction to Computer Networking  
(EC 441 - Spring 2020)  

Department of Electrical and Computer Engineering  
Boston University  

Contents  
1 List of Topics  
2 General Information  
3 Course Components and Grading  

1 List of Topics  
This course is an introduction to the foundations and design of computer networks, at an advanced undergraduate-level. We expect to cover the following topics:  

Networking Foundations: Network elements and architectures, packet and circuit switching, performance measures (delay, throughput), OSI and TCP/IP protocol suites, layering.  

Applications: World Wide Web (HTTP), the domain name system (DNS), E-mail (SMTP), Internet socket programming.  

Transport Protocols and Reliable Data Transfer: Connectionless transport: UDP, Connection-oriented transport: reliable transfer, sliding window protocols (Stop & Wait, Go-Back-N, Selective Repeat), TCP, congestion control, time-out computation.  

Internetworking: Internet protocol (IP), IP addressing, subnetting, forwarding, routing algorithms (Dijkstra, Bellman-Ford), distance-vector routing, link-state routing.  

Link Layer, LANs, and MAC Protocols: Framing, error detection and correction, multiple access protocols, Aloha, CSMA, Ethernet (IEEE 802.3), Ethernet switches, address resolution protocol (ARP).
Advanced Topics: Software-defined networking, network security, peer-to-peer networks, wireless LANs (IEEE 802.11).

Networking Tools: Wireshark, Python sockets, ns-2, Mininet, OpenFlow, ping, traceroute, nslookup, ifconfig, iPerf.

2 General Information

Time & Location: Tuesday and Thursday, 9-10:45am, PHO 117
Instructor: Professor Jeff Carruthers (jbc@bu.edu)
Teaching Fellow: Johannes Becker (jkbecker@bu.edu)
Course Web Site: ec441 on curl.bu.edu
Required Textbook:
ISBN 9780133594140
Prerequisites:
1. EC 381 (ECE Probability)
2. EC 401 (Signals and Systems)
3. Familiarity with programming (MATLAB, Python, etc.)

3 Course Components and Grading

- Homeworks, Labs, Projects (30%)
- Quizzes and Participation (inclass and online) (10%)
- Midterm One (15%)
- Midterm Two (15%)
- Final Exam (30%)