

Syllabus:

1. What is the Internet? What is a protocol?
2. The network edge, the network core, performance: delay, loss, throughput, layering, encapsulation, networks under attack
3. Principles of networked applications, the Web and HTTP, e-mail, DNS
4. Video Streaming, and Content Distribution Networks
5. Introduction to the transport layer, multiplexing and demultiplexing, UDP
6. TCP: connection management
7. Principles of congestion control, TCP congestion control
8. Congestion control futures, introduction to the network layer (forwarding, routing; data plane, control plane)
9. The Internet Protocol (IPv4, addressing, NAT, IPv6)
10. Generalized Forwarding and SDN, middleboxes
11. Link-state and distance-vector routing algorithm
12. Routing Protocols: OSPF, BGP, SDN control plane
13. Intro to the link layer, error detection and correction, multiple access protocols
14. Cable networks (DOCSIS), Switched LANs
15. Data Center networking, retrospective: A day in the life of web page request
16. The wireless channel, Wi-Fi and Bluetooth, 4G/5G networks
17. Mobility management principles; mobility in 4G/5G
18. Networking Futures. Class wrap-up.