



Introduction to Computer Networks
21:198:356 (3 credits)

COURSE DESCRIPTION:

This course provides an introduction to computer networks, with a special focus on the Internet architecture and protocols. Topics include layered network architectures, addressing, naming, forwarding, routing, communication reliability, the client-server model, web and email protocols. Besides the theoretical foundations, students acquire practical experience by programming reduced versions of real Internet protocols.

PREREQUISITE:

21:198:102 "Computers & Programming II" or equivalent

TEXTBOOK:

Kurose & Ross, Computer Networking: A Top-down Approach, 7th Ed., published by Pearson
ISBN: 9780133594140

DEPARTMENT WEB SITE: <http://www.ncas.rutgers.edu/math>

THIS COURSE COVERS THE FOLLOWING TOPICS:

Computer Networks and the Internet:

- What is the Internet?
- The Network Edge
- The Network Core
- Delay, Loss, and Throughput in Packet-Switched Networks
- Internet Architecture Overview

Application Layer

- The Web and HTTP
- FTP
- DNS
- Socket Programming (with UDP, TCP)

Transport Layer

- UDP
- TCP

The Network Layer

- Forwarding and Routing
- Network Service Models

- Routers
- The Internet Protocol (IP)
- Routing Algorithms:
 - The Link-State (LS) Routing Algorithm
 - The Distance Vector (DV) Routing Algorithm

The Link Layer: Links, Access Networks, and LANs:

- Switched LANs: Link-Layer Addressing and ARP
- Ethernet
- Link-Layer Switches
- VLANs

Wireless and Mobile Networks:

- WiFi: 802.11 Wireless LANs

Multimedia Networking:

- Multimedia Networking Applications
- Streaming Stored Video
- Network Support for Multimedia

Security in Computer Networks

- Messaging Integrity and Digital Signatures

Department of Mathematics & Computer Science
Smith Hall 216, 101 Warren Street, Newark, New Jersey 07102
Phone: (973) 353-5156 Fax: (973) 353-5270