

CS 555-001 Computer Communication and Networks

Location:	East Building 122 Fairfax
Meeting Time:	Tuesday 4:30
Instructor:	Dr. Maha Shamseddine
Office	Buchanan 215I
E-mail:	mshams@gmu.edu
Office Hours:	T 11-12:30, R 11-12:30, 1-2 or by appointment
Teaching Assistant:	Dhakal, Roshan

Description:

This course introduces concepts and design principles of modern computer and telecommunication networks. It uses the Internet TCP/IP protocol suite to discuss how computer networks operate and how and why they have evolved over many years to meet the requirements of today's networking applications. The focus will be on both - fundamental networking and communication techniques, and protocols used in the present day complex Internet architecture.

Topics include DNS and HTTP protocols at the application layer, TCP and UDP at transport layer, routing algorithms and forwarding with BGP and OSPF at network layer, and multiple access technologies along with Ethernet and WiFi LANs.

Concepts of network security and related protocols like the Transport Layer Security (TLS) suite and DNS' Security Extensions (DNSSEC) will also be introduced.

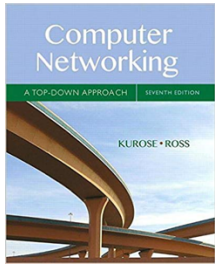
PREREQUISITES

(Undergraduate level CS 310) and (Undergraduate level CS 367) and (Undergraduate level Stat 344). In order to succeed in the class you *must* be an expert in programming in either C, Python or Java.

READINGS

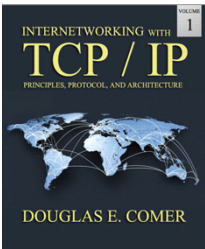
The main resource for this class is the lectures delivered by the instructor, supported by the course slides and the primary textbook. We will be using the textbook extensively, so it is considered required.

Required Textbook



Computer Networking, a top down approach, 7th (seventh) Edition, ISBN: 9780133594140 by James Kurose, Keith Ross, Pearson (2017)

Recommended Textbook



Internetworking with TCP_IP Volume One. Principles, Protocols, and Architecture, Sixth Edition, ISBN: 013608530X, Douglas E. Comer - Addison-Wesley (2013)

TOPICS

- Introduction to computer networks and Internet protocol suite
- Internet architecture - edge, core and layered service model
- Application layer principles and protocols (DNS, HTTP, SNMP, etc.)
- Transport layer services, TCP, reliable delivery, congestion control, and UDP
- Network layer data plane principles, forwarding and routing, addressing, IPv6, and DHCP
- Network layer control plane overview, routing algorithms, SDN control plane, OSPF and BGP
- Link layer services, error detection and correction, and multiple access protocols
- Introduction to wireless and mobile networks with 802.11 wireless LANs
- Computer Network Security

CLASS MATERIALS

All class materials, including lecture notes and programming assignments, are available through your Blackboard accounts. You are responsible for obtaining the textbook(s).

GRADING POLICY

Your grade will be calculated as follows:

- 35% Programming projects
- 30% Final exam, cumulative
- 30% Home works and Labs, to be done individually
- 5% Quiz given approximately halfway through semester

A final exam score of less than 50 results in an F for the course. If you think your work as not be correctly graded then you must initiate contact with the grader within a week of receiving the grade (either in the lecture during which it was first handed out or on the Blackboard). Grade contesting beyond this time window will not be allowed.

POLICIES

- Late submissions of home works, labs and programming assignments will be penalized at 15% each day, and will not be accepted after 2 days of the due date.
- Final exam is cumulative. Subject to change, it is closed book and notes.
- No early final exam will be given.

DISABILITY STATEMENT

If you have a learning or physical difference that may affect your academic work, you will need to furnish appropriate documentation to GMU Disability Resource Center. If you qualify for accommodation, the DRC staff will give you a form detailing appropriate accommodations for your instructor. If you have such a condition, you must talk to the instructor during the first week of the term about the issue.

[Disability Resource Center](#)

HONOR CODE

The GMU Honor Code will be *strictly* enforced. Please make sure that you are familiar with it. We will discuss this further in class. Below is the link to the code.

[Honor Code](#)

- We reserve the right to use [MOSS](#) to detect plagiarism.