

CS/ECE 4457: Computer Networks**Spring 2021**

v1.0

Instructor

Angela Orebaugh
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Class Meetings

T/Th 3:30-4:45pm
via Zoom on Collab

*class meetings are
recorded

Course Content

Available on Collab

Office Hours

Th 4:45-5:30pm
via Zoom and by
appointment

TAs

Sonya Gerdabad
sy2med@virginia.edu

Bryam Ayvar
bla4wub@virginia.edu

Course Overview

Without networking, the Internet wouldn't exist. We will demystify the Internet and other communication networks over the course of the semester by providing a foundation in computer networking across the OSI and TCP/IP networking models. We will take a practical approach and emphasize the core systems that make global-scale networking possible. You will learn about network design, protocols, network monitoring and troubleshooting, wireless and mobile networks, and network security.

Prerequisites

CS 3330 Computer Architecture or ECE 3430 Introduction to Embedded Computer Systems.

Textbooks

The textbook provides foundational concepts and is available to access free online through UVA library's partnership with O'Reilly/Safari Books Online. The textbook is a good resource, but you are not required to purchase it. You may also use the 5th edition.

Computer Networks 6th Edition, Andrew Tanenbaum and David Wetherall, 2020, ISBN-10: 0135408008.

Other good supplementary resources are:

CompTIA Network+ Certification All-in-One Exam Guide, 7th Edition (Exam N10-007), Mike Meyers, 2018, ISBN-10: 1260122387

Computer Networking: A Top-Down Approach, 7th Edition, James Kurose and Keith Ross, 2016, ISBN-10: 9780133594140

These books are not required and are available to read online for free through UVA library's partnership with O'Reilly/Safari Books Online.

Required Technical Resources

You will need a computer with a web browser and high speed Internet connection with the capability to view multimedia clips, read prepared content, and join the live Zoom sessions.

Assessment Components

You will be evaluated by lab assignments, homework assignments, exams, and a final project.

- **Lab Assignments (50 points)** – You will be responsible for completing 5 lab assignments. Each assignment will have an exact due date and time that it shall be submitted on Collab for grading. These assignments help you develop critical thinking, problem solving, analysis, and hands-on experience. Evaluation Criteria – Your lab assignments will be evaluated on completeness, applying course concepts, interpreting results, and ability to achieve the desired outcome.
- **Homework Assignments (15 points)** – You will be responsible for completing 3 homework assignments. Each assignment will have an exact due date and time that it shall be submitted on Collab for grading. These assignments help you develop critical thinking, creativity, analysis, and written communication skills. Evaluation Criteria – Your homework assignments will be evaluated on completeness, applying course concepts, applying critical thinking skills to articulate solutions to problems, and writing clarity and succinctness.
- **Exams (15 points)** – You will be responsible for completing 3 exams. Each exam will be based on posted reading assignments and lectures and have an exact due date and time that it shall be completed on Collab. Exams help assess your level of knowledge and understanding of network topics. Evaluation Criteria – Exams will be evaluated using the appropriate exam answer key.
- **Final Project (20 points)** – You will be responsible for completing a final project to design a network strategy. The project will be used to ensure the principles of the course have been mastered at an acceptable level. Evaluation Criteria – Final projects will be evaluated on completeness, applying course concepts, applying critical thinking skills to articulate solutions to problems, and writing clarity and succinctness.

Assessment Component Honor Code and Late Policy

The UVA Honor Code is in effect for all assessment components and will automatically be included for assessment components submitted on Collab. **Late submissions will receive a grade reduction of 10% per day.** If you have any special circumstances, they need to be **communicated in advance.**

Assessment Component Allocation

Week	Points
Lab exercises	50 points (5 labs @10pts each)
Homework assignments	15 points (3 @5pts each)
Exams	15 points (3 exams @5pts each)
Final Project	20 points

Grading

A+	100	B	83-86	C-	70-72
A	95-99	B-	80-82	D+	67-69
A-	90-94	C+	77-79	D	63-66
B+	87-89	C	73-76	D-	60-62
				F	Below 60 (no credit)

Course Schedule

Week	Date	Topic and Readings	Activities
Week 1	T–Feb 2	Course overview and introduction	
	Th–Feb 4	Network models	
Week 2	T–Feb 9	Wireshark and Cyber Range	
	Th–Feb 11	Network design	
Week 3	T–Feb 16	Physical layer	
	Th–Feb 18	Physical layer continued	HW Assignment #1 due Feb 18 @11:59pm
Week 4	T–Feb 23	Exam 1	
	Th–Feb 25	Data link layer	
Week 5	T–Mar 2	Data link layer continued	
	Th–Mar 4	Lab day	Lab #1 due Mar 4 @11:59pm
Week 6	T–Mar 9	No class – Break Day	
	Th–Mar 11	Network layer	
Week 7	T–Mar 16	Network layer continued	
	Th–Mar 18	Lab day	Lab #2 due Mar 18 @11:59pm
Week 8	T–Mar 23	Exam 2	
	Th–Mar 25	Transport layer	HW Assignment #2 due Mar 25 @11:59pm
Week 9	T–Mar 30	Transport layer/sockets	
	Th–Apr 1	Lab day	Lab #3 due Apr 1 @11:59pm
Week 10	T–Apr 6	Application layer	
	Th–Apr 8	Lab day	Lab #4 due Apr 8 @11:59pm
Week 11	T–Apr 13	Network monitoring/troubleshooting	
	Th–Apr 15	No class – Break Day	HW Assignment #3 due Apr 15 @11:59pm
Week 12	T–Apr 20	Exam 3	
	Th–Apr 22	Network security	
Week 13	T–Apr 27	Network security continued	
	Th–Apr 29	Lab day	Lab #5 due Apr 29 @11:59pm
Week 14	T–May 4	Course wrap up	
	Th–May 6	Final project	Final project due May 6 @11:59pm

Students with disabilities or learning needs

It is my goal to create a learning experience that is as accessible as possible. If you anticipate any issues related to the format, materials, or requirements of this course, please meet with me outside of class so we can explore potential options. Students with disabilities may also wish to work with the Student Disability Access Center to discuss a range of options to removing barriers in this course, including official accommodations. Please visit their website for information on this process and to apply for services online: sdac.studenthealth.virginia.edu. If you have already been approved for accommodations through SDAC, please send me your accommodation letter and meet with me so we can develop an implementation plan together.

Discrimination and power-based violence

The University of Virginia is dedicated to providing a safe and equitable learning environment for all students. To that end, it is vital that you know two values that I and the University hold as critically important:

1. Power-based personal violence will not be tolerated.
2. Everyone has a responsibility to do their part to maintain a safe community on Grounds.

If you or someone you know has been affected by power-based personal violence, more information can be found on the UVA Sexual Violence website that describes reporting options and resources available - www.virginia.edu/sexualviolence.

As your professor and as a person, know that I care about you and your well-being and stand ready to provide support and resources as I can. As a faculty member, I am a responsible employee, which means that I am required by University policy and federal law to report what you tell me to the University's Title IX Coordinator. The Title IX Coordinator's job is to ensure that the reporting student receives the resources and support that they need, while also reviewing the information presented to determine whether further action is necessary to ensure survivor safety and the safety of the University community. If you wish to report something that you have seen, you can do so at the **Just Report It** portal. The **worst possible situation would be for you or your friend to remain silent when there are so many here willing and able to help.**

Religious accommodations

It is the University's long-standing policy and practice to reasonably accommodate students so that they do not experience an adverse academic consequence when sincerely held religious beliefs or observances conflict with academic requirements.

Students who wish to request academic accommodation for a religious observance should submit their request in writing directly to me by email as far in advance as possible. Students who have questions or concerns about academic accommodations for religious observance or religious beliefs may contact the University's Office for Equal Opportunity and Civil Rights (EOCR) at UVAEOCR@virginia.edu or 434-924-3200.

Version change control:

1/8/21 v1.0 syllabus created.