

University of Maine — ECE435: Network Engineering – Spring 2021

Instructor:

Vincent Weaver, e-mail: vincent.weaver@maine.edu

Office: Barrows 203, Office Hours: e-mail for appointment

Course Website:

http://web.eece.maine.edu/~vweaver/classes/ece435_2021s/

Lectures: Tuesday/Thursday 9:30am-10:45am, Barrows 125

Lectures will be streamed/recorded via Zoom.

Final Exam: Tuesday 4 May 2021, 8am-10am, Barrows 119

Course Listing:

Focuses on the engineering aspects of data networks including physical media and interconnections, signals and noise, modulation, multiplexing, frame and packet transmission, routing, network design and network management. Problem solving and diagnostic methods, legal and professional issues, ethics and policies, and security aspects of interconnected networks are discussed. Students gain hands-on experience and complete networking projects.

Pre-requisites: ECE331 or COS331 or ECE471 (or permission of instructor)

This course will be easier if you already have some Linux command-line experience.

Textbook: None Required.

Optionally: “Computer Networks” by Tanenbaum, Feamster, and Wetherall.

Hardware: Access to system with wired Ethernet (Raspberry Pi, Linux desktop/laptop, etc.)

By the end of the course you will:

- Be able to identify the OSI Network Layers
- Program sockets in C
- Know how common protocols work (DNS, ssh, SMTP, http)
- Be able to write a simple webserver
- Understand how public-key encryption, key exchange, and hashes work
- Know all about TCP/IP, IPv4 and IPv6
- Use tcpdump to analyze network traces
- Explain how wired Ethernet works
- Be able to make Ethernet cables
- Explain how Wi-fi works
- Know how routing works
- Understand practical and ethical concerns with network security
- Know the tradeoffs found at the physical layer (wire, fiber, wireless)

Assignments:

Assignments will be announced in class and posted to the website.

Homework submissions will be done via e-mail.

Grading:

Class Participation (5%)

11 homework assignments (lowest one dropped) (50% total)

1 project (20%)

1 midterm exam (10%), 1 final exam (15%)

Late Work: Late work is penalized at 20% a day.

University of Maine required Statements

Academic Honesty Statement

Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University. Please see the University of Maine System's Academic Integrity Policy listed in the Board Policy Manual as Policy 314 (Date Issued: September 1, 2020): <https://www.maine.edu/board-of-trustees/policy-manual/section-314/>

Students Accessibility Services Statement

If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with Professor Weaver privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause)

In the event of an extended disruption of normal classroom activities (due to COVID-19 or other long-term disruptions), the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Observance of Religious Holidays/Events

The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to Title IX Student Services or the Office of Equal Opportunity.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.

For *confidential resources off campus*: **Rape Response Services: 1-800-871-7741** or **Partners for Peace: 1-800-863-9909**.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: **Title IX Student Services: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911**. Or see the OSAPV website for a complete list of services. <https://umaine.edu/titleix/>