CS 433/533: Computer & Network Security
Winter 2026

Course Description

As both a science and an art, computer and network security has become one of those must-learn disciplines. This course will be comprehensive, covering both fundamental security topics and practical solutions. Yet, it is designed to be manageable for effective learning. Twenty lectures over ten weeks are designed for this class. Here are sample topics (each with a sample question):

- Elementary cryptography (what is the difference between classic cryptography and public-key cryptography?)
- Program security (why virus/worm/Trojan horses are rampant on computer and networks?)
- Protection in general-purpose operating systems (what is access control of memory/address/file/user account?)
- Designing trusted operating systems (can virtualization or layered design help secure an OS?)
- Security in networks (can a firewall deal with all network security threats?)
- Privacy (Is your email or web visits protected with good privacy?)
- Administering security (how to conduct risk analysis and design your security policies?)
- Legal and ethical issues in computer security (now that we catch an attacker, so what?)

Prerequisites

- CS 415 (Operating Systems) for CS 433; **CS 432 Recommended**

Instructor

- Prof Jun Li
- Email: `lijun@uoregon.edu`
- Office hours: **Thursdays 10-11 AM**, Deschutes 362

TA

- Kai Iverson
- Email: `kaive@uoregon.edu`
- Office hours: **Mondays 2:30-3:30 PM, Wednesdays 10:30-11:30 AM, Thursdays TBD**, Deschutes 313

Textbooks and Readings

- **Textbook:** *Security in Computing, 6th edition*, by Charles P. Pfleeger, Shari Lawrence Pfleeger and Lizzie Coles-Kemp. ISBN-10: 0137891210.
- **Slides:** Class slides will be provided on Canvas as soon as they are available.

Expected Learning Outcomes

Upon successful completion of the course, students will be able to:

- Understand basic concepts of cryptography, including classic and public key cryptography and use of encryption;
- Understand fundamental concepts and issues with program security, including buffer overflow, computer viruses, and countermeasures against program threats;
- Become familiar with security methods of ordinary operating systems (OS) and concepts and methods for trusted OS;
- Become aware of threats in networks and become familiar with common methods in securing networks and communications, including firewalls and security protocols;
- Understand basic concepts with cloud computing security;
- Grasp essential concepts with security administration, legal and ethical security issues, and privacy; *and*
- Developed experience in working on a term-long class project, including skills ranging from identifying a topic, developing a plan, and executing the plan.

Acquired Skills

Upon successful completion of the course, students will have acquired the following essential skills:

- Identifying an interesting security project topic and developing a plan for carrying out the project;
- **Exercising a systematic approach to a security problem**;
- Improved skills in programming and data analysis; and
- Improved team work and presentation skills.

Estimated Student Workload

The workload of this course is expected to be as follows.

- Class attendance and participation. Students should attend the lectures and actively participate in the class, including raising questions and participating discussions.
- Course review and homework.
  - Students should carefully review the class materials after the class.
  - There will be **3-4** homeworks throughout the term.

- Class project. **Every** student is required to form a team of 2 or 3 students to work on a class project (3 for CS 433 and 2 for CS 533 with exception request to TA). With the help of the professor and the TA, every team will identify an interesting problem related to the course material, design, implement, and evaluate a solution, and write a **project report**.

  Warning: The class project can be a lot of fun, but can be also time-demanding. **Start ASAP.**

- Midterm: **February 19, 2026, in class**.
- *No Final Exam.*

Course Requirements and Grading

- Overall:

  Class participation 10% **Homework 15%** **Midterm 35%** **Class Project 40%**

- For class project:

  Project proposal 15% **Project proposal presentation 5%** **Midterm report 15%**
  Project presentation 10% **Final deliverables 55%**

- Grading rubric:

  A+ [95, 100]% A [90, 95)% A- [85, 90)% B+ [80, 85)% B [75, 80)% B- [70, 75)%
  C+ [65, 70)% C [60, 65)% C- [55, 60)% D+ [50, 55)% D [45, 50)% D- [40, 45)% F [0,40)%

  A Excellent. Solid grasp of concepts, approaches, and/or skills introduced or used in this course. Very well prepared to apply this knowledge to future studies or employment.

  B Very good. Generally good grasp of concepts, approaches, and/or skills introduced or used in this course. Prepared to apply this knowledge to future studies or employment.

  C Pass. Basic grasp of concepts, approaches, and/or skills introduced or used in this course. Minimally prepared to apply this knowledge to future studies or employment.

  D No Pass (Earns UO credit). Demonstrated grasp of concepts, approaches, and/or programming skills introduced or used in this course is not yet sufficient to apply this knowledge to future studies or employment.

  F No Pass (No credit). Little or no demonstrated grasp of concepts, approaches, and/or programming skills introduced or used in this course, and/or failure to carry out much of the required work.

  A+ Distinction. A+ grades will be given only in cases where the student has excelled in all course topics and overall performance is distinctly better than that required for an A grade.

Schedule(tentative)

Course Policies

Class attendance

We apply a "reason-neural" class attendance policy in that we will not ask for reasons for absences, except for disability-related accommodations, religious observances, university-sponsored events, and cases where students have Emergency Academic Notification through the Dean of Students. In those cases, it is up to the student to ask for accommodations for these reasons and provide the necessary documentation prior to missing class or turning in late work, usually at the beginning of the term.

A student may miss up to two classes with no impact on their grade; an exception can be made in extraordinary circumstances by emailing a request (without disclosing details) to the TA.

We will randomly check student class attendance using quizzes, class photos, or attendance sheet. For each 10% of no attendance record beyond the first 10%, the student will lose 10% of class participation points.

Lecture	*Section*	*Coverage*	*Projects and Homework*
1 (1/6)	1.1–1.7	`syllabus`; introduction	
2 (1/8)	2.1–2.2	authentication and access control	
3 (1/13)	2.3	elementary cryptogrphy (1)	
4 (1/15)	2.3	elementary cryptogrphy (2)	project idea presentation
5 (1/20)	slides	use of encryption (1)	project proposal due
6 (1/22)	slides	use of encryption (2)	
7 (1/27)	3.1–3.3	program security	
8 (1/29)	5.1	operating systems security (1)	HW 1 due
9 (2/3)	5.2	operating systems security (2)	
10 (2/5)	6.1–6.3	network security (1)	
11 (2/10)	6.4–6.5	network security (2)	HW 2 due
12 (2/12)	6.6–6.10	network security (3)	project midterm report due
13 (2/17)		*buffer lecture*	
14 (2/19)	-	`Midterm`	
15 (2/24)	8.1–8.2	cloud security	
16 (2/26)	10.3-4;11.1–8	incidents, risk, legal issues and ethics	HW 3 due
17 (3/3)	9; 13	privacy; emerging topics	
18 (3/5)		midterm discussion	HW 4 due
19 (3/10)	-	`project presentation`	
20 (3/12)	-	`project presentation`	
			project delivery (report etc.)

Late Submissions of Assignments

All students have one "late submission token"—an opportunity to turn in an assignment up to one week late for any reason, no questions asked (except for assignments due in week 10 or finals week). You may wait until week 10 to elect which late submission to apply this token.

Except for the 7 days waived by the token, **15%** penalty per day will be applied to any late submission.

Outside Classroom Communication

We encourage everyone to get in touch with the professor and the TA when you have a question. Your email subject must begin with **CS 433:** or **CS 533:** to help email filtering.

GenAI Use

Students can use GenAI tools in this class to help with certain aspects of course work and assignments. This includes reviewing course materials, brainstorming ideas, creating a paper outline, or summarizing findings of research articles in the literature. However, you cannot use content such as text or graphics created by GenAI tools in your work; rather, you must be the author/creator of your work submissions. For example, you can use a GenAI tool to suggest a paper outline based on a draft you provide it, but you cannot submit a paper with part or all of its text generated by GenAI as if the text is your own writing. Be advised, in accordance with UO policy, if I believe you've handed in work created in whole or in part by GenAI tools, I may submit a report of suspected academic misconduct to the Office of Student Conduct and Community Standards for that office to make a determination of responsibility and, if warranted, assess a grade penalty. So, if you are in doubt or have questions about a particular GenAI tool and if its use is okay, check in with me or TA and let's discuss!

University Course Policies

Please see `https://teaching.uoregon.edu/university-course-policies`.