

CS425/CS525/ECE434/ECE534: Computer Networks Fall 2024

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About This Course

Catalog Description

CS425/CS525/ECE434/ECE534 (3-0-3)(F)

Concepts and implementation of networking: physical, link, network, transport, and application layer protocols. Wireless networking and security basics.

Course Learning Outcomes

By taking this course, the student will be able to

- [CLO 1] understand the architectural principles of computer networking and compare different approaches to organizing networks
- [CLO 2] understand good network design: simplicity, scalability, performance, and the end-to-end principle
- [CLO 3] understand how the Internet works today
- [CLO 4] judge the effectiveness of existing or similar network protocols
- [CLO 5] be conversant with primitives of network application programming

Student Outcomes [aka Program Learning Outcomes]

The computer science program will enable students, by the time of graduation, to be able to:

- **Student Outcome 1.** Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- **Student Outcome 2.** Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- **Student Outcome 3:** Communicate effectively in a variety of professional contexts.
- **Student Outcome 4:** Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- **Student Outcome 5.** Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.

- **Student Outcome 6.** Apply computer science theory and software development fundamentals to produce computing-based solutions.

This course addresses Student Outcomes 1, 2, 5, and 6.

Course Essentials

Logistics

Instructor: Dr. Huadi Zhu

Office: CCP 359 **Phone:** 208-426-5766 **Email:** huadizhu@boisestate.edu

TA: [Shipra Kumari](#) **Email:** shiprakumari@u.boisestate.edu

Zoom:

<https://boisestate.zoom.us/j/92533767210?pwd=QfCxP4LYCALht4ojb12LgyuMvkaar4.1>

Class Home Page: via Canvas

Office Hours: Tue Thu 2:45 pm–3:45 pm, in-person

Class Time: Tue Thu 1:45 pm–2:45 pm **Location:** CCP 243

Course Format

Canvas

The class will be hosted and managed on Canvas.

Required Materials/Texts

- Computer Networking: A Top-Down Approach, by Jim Kurose and Keith Ross (8th edition).

Note that if you choose to use an earlier edition, it's your responsibility to identify any differences in the editions.

Topics

Background topics:

- [Chapter 1. Course Overview and Introduction](#) (1.5 week)
- [Chapter 2. Application Layer](#) (2 week)

- *Chapter 3. Transport Layer* (2 weeks)
- *Chapter 4. Network Layer I* (1.5 week)
- *Chapter 5. Network Layer II* (1.5 week)
- *Chapter 6. Link Layer* (2 week)
- *Chapter 7. Wireless Networks* (2 weeks)
- *Chapter 8. Network Security* (1 week)
- *Multimedia and Current Topics* (0.5 week)

Technology Essentials

Technology Requirements

This course has the following software and hardware requirements:

- A modern desktop/laptop running MS Windows, OS X, or Linux

Students can use the lab computers if they don't have a working system but they will find it much more convenient to do the work on their own systems.

Digital Skills

- Be familiar and comfortable using Canvas, Linux and either Microsoft Windows or OS X.
- Be familiar with or able to learn Wireshark.
- Be familiar with basic programming in Python, Java, C, C++, etc.
- Be familiar with programming software development IDEs such as Eclipse, IntelliJ, or VS Code. Be comfortable with using objects, generics, and inheritance.
- Be familiar with working with code repositories on *GitHub*. Students can create a *GitHub* account for free, if they don't already have one.

Data and Privacy Policy

Please see university policy on data and privacy: <https://www.boisestate.edu/privacy/>

Technical Support

- Specific support for software tools, libraries and languages used in the class can be obtained from teaching assistants and instructors.
- Support for CS department computing resources can be obtained by emailing COENITSVCS-group@boisestate.edu (or benjaminpeterson@boisestate.edu)

- For other IT support, contact help desk (helpdesk@boisestate.edu or (208) 426-4357)

Accessibility

Github: <https://government.github.com/accessibility>

Wireshark: <https://www.wireshark.org/>

VSCode: <https://code.visualstudio.com/docs/editor/accessibility>

IntelliJ: <https://www.jetbrains.com/help/idea/accessibility.html>

Eclipse: <https://wiki.eclipse.org/Accessibility>

Coursework and Grading

Assessments

The assessments add up to 100 points for 100% credit.

Assignments

- **Homework assignments:** Answer questions based on the textbook and lectures. [2 weeks each] [**UG: 4 x 100 points x 5% = 20 points, Grad: 4 x 100 points x 3.75% = 15 points**] [**CLO1, CLO2, CLO4**]
- **Lab assignments:** Run Wireshark and submit a technical report for result analysis. [2 weeks each] [**2 x 100 x 2.5% = 5 points**] [**CLO1, CLO2, CLO4**]
- **Research assignment (graduate only):** Read a technical paper and submit a report. [2 weeks] [**Grad: 100 x 5% = 5 points**] [**CLO1-4**]

Project

- **Group project:** A coding project to implement a designed protocol. [**100 points x 20% = 20 points**] [**CLO1-5**]

Exams

- **Midterm exams:** In-person midterm exams [**2 x 100 x 10% = 20 points**] [**CLO1-4**]
- **Final exam:** In-person final exam [**100 points x 30% = 30 points**] [**CLO1-4**]

Class Participation and Proactiveness

- Attending class regularly, participating actively in the classroom, taking in-class pop-up quizzes [5 points] [CLO1-5]

Grade Distribution

Grades for this class are calculated by dividing the number of points earned over the semester by the total number of points available. Final letter grades will be assigned according to the table below. The instructor may lower the cutoffs but will not increase the cutoffs.

95% and more	A+	78% and less than 81%	B-	63% and less than 66%	D
90% and less than 95%	A	75% and less than 78%	C+	60% and less than 63%	D-
87% and less than 90%	A-	72% and less than 75%	C	0 and less than 60%	F
84% and less than 87%	B+	69% and less than 72%	C-		
81% and less than 84%	B	66% and less than 69%	D+		

Late Work Policy

For the assignments (homework or projects), you have a **budget of 6 late days** to use throughout the semester, at your discretion. Think of these as a resource to help you with unexpected things during the semester.

- Each late day extends an assignment deadline by 24 hours with no penalty.
- Late days are indivisible, so submitting an assignment 12 hours late requires an entire late day.
- You may use up to 3 late days on a single assignment.

When submitting an assignment using a late day, state with your submission the number of days you are using. The simplest way is to include a note in your README.md file or via a note on the Canvas submission page.

This policy is designed to accommodate most ordinary needs for extensions or late submissions. Therefore, exceptions beyond this policy will not generally be granted; any requests for individual exceptions must be submitted in writing so that I have a record of the request and my response.

Exams will be at the published times. It will be up to the discretion of the instructor to provide a makeup exam.

Tentative Course Schedule

This will be provided on Canvas.

How to Succeed in the Course

Support Resources For You

Student Well-being

If you are struggling for any reason (COVID, relationship, family, or life's stresses) and believe these may impact your performance in the course, I encourage you to contact the Dean of Students at (208) 426-1527 or email deanofstudents@boisestate.edu for support. Additionally, if you are comfortable doing so, please reach out to me and I will provide any resources or accommodations that I can. If you notice a significant change in your mood, sleep, feelings of hopelessness or a lack of self worth, consider connecting immediately with Counseling Services (1529 Belmont Street, Norco Building) at (208) 426-1459 or email healthservices@boisestate.edu.

University Policies and Resources

- For temporary or permanent disabilities, please see [this section](#) for help.
- See this [common document](#) for important COVID related information.
- Make sure to review the university and department policies on [Academic Integrity](#).
- [General resources for students](#)