

Cornell Bowers CIS Computer Science

CS4450/5456: Introduction to Computer Networks *Spring 2024*

Instructor: Rachee Singh Instructor Email: rachee@cs.cornell.edu Office Hours: Wed 1-2 PM, 441B Gates Hall	Course Staff: Team of teaching assistants Staff Office Hours: racheesingh.com/ computernetworks/staff/
Meeting Location: Klarman Hall KG70 Credits: 3 Meeting Time: Mon/Wed, 2.55 PM — 4.10 PM Course Website: racheesingh.com/ computernetworks/	Canvas Page: canvas.cornell.edu/courses/ 62729 Instruction Modality: In-Person Prerequisites: None; CS4410 is recommended Grading: letter grade; no S/U or audit

Course Description: This undergraduate-level course will cover the key principles of computer networking that underlie the design and operation of the Internet. The course will explore both the communication protocols used by the core components of the Internet (e.g., routing, forwarding) and those utilized at the endpoints of the network (e.g., congestion control, domain name system). The course will provide a primer on the information-theoretic principles that govern transfer of bits on physical media between network nodes. Finally, this course will teach students how computer networks have evolved to accommodate a growing number of Internet users and applications.

Course Learning Outcomes: Upon completion of this course, you will be able to:

- Understand the architectural principles (e.g., end-to-end principle, layering principle, fate sharing principle) that underpin the design of the Internet.
- Identify the technical trade-offs between different networking architectures (e.g., packet vs. circuit switching).
- Understand communication protocols in the core (Layer 3 routing, Layer 2 forwarding protocols) and at the endpoints of the network (reliable transport, congestion control).
- Reason about network performance, scalability and reliability.

- Develop an end-to-end understanding of how the Internet works.

Course Textbook: The course uses the textbook: [Computer Networks: A Systems Approach](#) (5th Edition) by Larry Peterson and Bruce Davie. The e-book version of this textbook is available at the [Cornell Library](#).

Assessing Student Achievement:

- **Grade Determination:** In-class participation (5%), two prelim exams (20% each), a final exam (20%), homework (30%) and course evaluation (5%).
- **Homework:** This course has four homework assignments. Three homework assignments have long answer questions and one homework is programming based. The programming homework will be the last homework of the semester and its due date is during the final period. The programming component uses Python.
- **Grading Scale:** This course uses letter grades, which is the [official grading system at Cornell](#). Typically, 33% of the students in this course receive a grade of A- or higher, 80% of the students in this course receive a grade of B- or higher, and the median is the B/B+ grade.

Academic integrity: Each student in the course is expected to maintain a high level of ethical standards and integrity in this course. This means that all work submitted for grading by the student must be the result of their own individual effort. Students are expected to know and abide by Cornell's policy on academic integrity, including:

- [Cornell University's Code of Academic Integrity](#)
- [Computer Science Department Code of Academic Integrity](#)

Any violation of the academic integrity code is penalized according to the Cornell Academic Integrity Policy, and may result in failure in the course, suspension, or expulsion from the university.

Course Accommodations: Please request your accommodation letter early in the semester, or as soon as you become registered with [SDS](#), so that we have adequate time to arrange your accommodations.

- Once SDS approves your accommodation letter, it will be emailed to both you and me. Please follow up with me to discuss the necessary logistics of your accommodations.
- If you are approved for exam accommodations, please consult with me at least two weeks before the scheduled exam date to confirm the testing arrangements.
- If you experience any access barriers in this course, such as with printed content, graphics, online materials, or any communication barriers; reach out to me or SDS right away.

- If you need an immediate accommodation, please speak with me after class or send an email message to me and SDS at sds_cu@cornell.edu.
- If you have, or think you may have a disability, please contact Student Disability Services for a confidential discussion: sds_cu@cornell.edu, 607-254-4545, sds.cornell.edu.

Inclusivity Statement: This course aims to collectively create a welcoming, supportive and tolerant environment for all students and respects the various forms of diversity that they bring, including differences related to race, gender, sexuality, class, nationality, geography, age, size, ability, etc. Towards this purpose, I ask that we be respectful of each other, actively listen, participate, ask relevant questions, and give balanced, specific, and constructive verbal & written feedback to each other. Please let me know if there are circumstances affecting your ability to participate.

Mental Health and Stress Management Resources: If you are feeling overwhelmed, or are worried about a friend, please reach out to one of your instructors or your academic advisor. We can try to help or we can put you in touch with someone who can help. Cornell has trained counselors available to listen and help: Empathy, Assistance, and Referral Service (213 Willard Straight Hall, 607-255-3277), Cornell Health's Counseling and Psychological Services (CAPS, 607-255-5155), and Let's Talk. The Learning Strategies Center offers a range of academic resources. Notably, Cornell has recently invested a great deal of time and effort to offer more comprehensive support for our campus community. Please go to mentalhealth.cornell.edu to learn more.