

ECE 46300: Introduction to Computer Communication Networks

Fall 2025

1 Course Information

Course Number and Title: ECE 46300, Introduction to Computer Communication Networks.

CRN: 57741

Section: 001

Campus: West Lafayette

Instructional Modality: Face-to-Face

Lecture Time: Mon, Wed, Fri, 2:30–3:20pm in MATH 175.

Course Credit Hours: 3

Honors Contract: Yes

Prerequisites: ECE 36800 (Data Structures) and proficiency in C and Python programming languages.

Course Web Page: <https://engineering.purdue.edu/~vshriva/courses/ece46300fa25/index.html>

Course Brightspace Page: <https://purdue.brightspace.com/d2l/home/1360923>

Course Piazza Page: <https://piazza.com/purdue/fall2025/ece46300/home>

2 Instructor(s) Contact Information

Instructor

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3 Course Description

The goal of this course is to provide students with a proper grounding in the fundamentals of computer networking. The course will cover classic concepts such as packet vs. circuit switching, Internet architecture principles, naming and addressing, routing, forwarding, reliability, flow control, congestion control, and software-defined networking. The course will also provide students a hands-on experience of writing network applications through socket programming.

4 Course Topics

1. Packet vs. Circuit Switching
2. Internet Architecture Principles
3. Socket Programming
4. Network Performance Metrics
5. Data Link Layer – MAC Addressing, ARP, CSMA/CD, Switched Ethernet, MAC Learning, STP
6. Network Layer – IP Addressing, NAT, IP Forwarding, Distance Vector, Link State, BGP, DNS
7. Transport Layer – UDP, TCP Reliability, TCP Flow Control, TCP Congestion Control
8. Application Layer – Web, HTTP, TLS, HTTPS, HTTP/2, QUIC
9. Software-defined Network

5 Prerequisites

Proficiency in C and Python programming languages and knowledge of data structures (ECE 36800).

6 Learning Resources, Technology, and Texts

1. **Required Material:** Lecture slides and practice problem sets on Brightspace.
2. **Additional Reading:** [Computer Networks: A Systems Approach \(5th edition\)](#), by Peterson and Davie, Morgan Kaufmann, 2011, Hardcover ISBN: 9780123850591, eBook ISBN: 9780123850607.

7 Learning Outcomes

A student who successfully fulfills the course requirements will have demonstrated:

1. an understanding of the architectural principles underlying the Internet design.
2. an understanding of the design of various layers in the network stack, including data link layer, network layer, transport layer, and application layer.
3. a familiarity with router architecture, software-defined network, and datacenter network.
4. an ability to implement distributed routing, forwarding, and reliability protocols.
5. an ability to implement network applications using socket interface.

8 Honors Contract

This course offers an Honors contract to aid students to go beyond the material of the regular course and to produce work that engages deeper learning. Students who sign up for the Honors contract will be required to complete **one** extra milestone in Lab 3 in addition to the regular coursework. The milestone under Honors contract will account for 5% of the total grade.

Any student is eligible to contract a course for Honors credit so long as his/her cumulative GPA is 3.00 or above. The student does not need to be in the Honors College.

Once an Honors contract is successfully completed in a “regular” course, the word “Honors” is added to the name of the course, and this is the version that goes on the transcript.

To opt for Honors contract, students must request a Grade Mode Change via myPurdue before the start of the 3rd week of classes in the semester (Sep 8, 2025).

9 Assessments

Programming Labs — 35% of the grade

	Regular	Honors
Lab 1: HTTP Web Client	5%	5%
Lab 2: HTTP Web Server	10%	10%
Lab 3: Distributed Routing	10%	5%
▷ Honors Milestone	–	5%
Lab 4: Reliable Transport	10%	10%

Examinations — 65% of the grade

Lab 1 and Lab 2 will be in C while Lab 3 and Lab 4 will be in Python. All labs must be done individually with no collaboration and no use of AI tools allowed. No extensions will be granted for lab submissions as students will be given ample time to finish each lab. There will be 4 exams (1 prelim, 2 midterms, and 1 final). The preliminary exam will carry 5% credit while the two midterm exams and the final exam will carry 20% credit each. The syllabus for the exams will be non-cumulative, i.e., the syllabus for the next exam will not include topics covered in previous exams. All exams will be closed-book with no collaboration and no use of AI tools allowed. Barring extraordinary circumstances (serious medical situations or family emergencies, accompanied by verification and a prior notification to the instructor), no make-ups will be granted for exams. Students who are most active and helpful in answering questions on Piazza may receive bonus points.

Policy for Late Submissions

If a lab is submitted within 24 hours (1 day) after the deadline — 25% grade penalty.

If a lab is submitted within 48 hours (2 days) after the deadline — 50% grade penalty.

No submissions will be accepted beyond 48 hours (2 days) after the deadline.

Policy for Re-grade Requests

Students may submit re-grade requests for programming labs within 48 hours (2 days) after the grades are released. All re-grade requests must be submitted on Piazza as a private post with the title “Re-grade request for Lab [X]” followed by a justification for the re-grade request (without a justification, the request will be ignored). Any emails sent to the TAs or the instructor about the re-grade requests will also be ignored.

10 Course Schedule

Week	Dates	Topic	Lab
1	Aug 25 – Aug 29	Course Introduction Packet vs. Circuit Switching Internet Architecture Principles I	
2	Sep 1 – Sep 5	Labor Day Holiday Internet Architecture Principles II Internet Architecture Principles III	
3	Sep 8 – Sep 12	Socket Programming I Socket Programming II Socket Programming III	
4	Sep 15 – Sep 19	Preliminary Exam Network Performance Metrics I Network Performance Metrics II	Lab 1 release
5	Sep 22 – Sep 26	Data Link Layer I Data Link Layer II Data Link Layer III	Lab 1 due
6	Sep 29 – Oct 3	Data Link Layer IV Data Link Layer V Network Layer I	Lab 2 release
7	Oct 6 – Oct 10	Network Layer II Midterm Exam 1 Network Layer III	
8	Oct 13 – Oct 17	Fall Break Midterm Exam 1 Recap Network Layer IV	Lab 2 due
9	Oct 20 – Oct 24	Network Layer V Network Layer VI Network Layer VII	Lab 3 release
10	Oct 27 – Oct 31	Network Layer VIII Network Layer IX Transport Layer I	
11	Nov 3 – Nov 7	No Lecture [Simons Institute Workshop]	Lab 3 due
12	Nov 10 – Nov 14	Transport Layer II Midterm Exam 2 Transport Layer III	Lab 4 release
13	Nov 17 – Nov 21	Midterm Exam 2 Recap Transport Layer IV Transport Layer V	
14	Nov 24 – Nov 28	Transport Layer VI Thanksgiving Break	
15	Dec 1 – Dec 5	Transport Layer VII Transport Layer VIII Application Layer I	Lab 4 due
16	Dec 8 – Dec 12	Application Layer II Software-defined Network	
17	Dec 15 – Dec 19	Final Exams Week	

11 Grading Scale

The breakpoints for letter grades are shown below. The final letter grade will be based on each student's raw cumulative score at the end of the semester (normalized to 100 while accounting for the weight of each assessment). It may be possible that the raw cumulative score is "curved up" to adjust for the difficulty level of assessments, potentially resulting in a better final letter grade. For example, a student's raw cumulative score of 74 (B-) may be curved up to 78 (B) to adjust for the difficulty level. The adjustment factor will be decided by the instructor at the end of the semester, and will be applied uniformly to every student's raw cumulative score. Raw scores will never be "curved down".

Letter Grade	A+	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
Score (out of 100)	95+	90+	85+	80+	75+	70+	65+	60+	55+	50+	45+	40+	≤40

12 Attendance Policy

This course follows the [University Academic Regulations regarding class attendance](#), which state that students are expected to be present for every meeting of the classes in which they are enrolled. Attendance may be taken at the beginning of a class and lateness may be noted. When conflicts or absences can be anticipated, such as for many University-sponsored activities and religious observations, the student should inform the instructor of the situation as far in advance as possible. For unanticipated or emergency absences when advance notification is not possible, the student should contact the instructor as soon as possible by email. For absences that do not fall under excused absence regulations (see below), this course follows the following procedures:

1. Student should not come to class if they are feeling ill, but they **MUST** email the instructor with the subject line: [course code] absence. The instructor does not need details about the student's symptoms. The student should just let the instructor know that they are feeling ill and cannot come to class. If it is an emergency situation, the student should follow the University regulations on emergent medical care (see below).
2. Unless it falls under the University excused absence regulations (see below), any work due should be submitted on time via the course Brightspace.
3. If that day's class involves assessed work such as a test or presentation, student and the instructor will plan if and how the student can make up the work, following the assignment guidelines. This plan must be done before the next class period, so again, the student should email the instructor immediately when they know that they will miss class.
4. The most important consideration in any absence is how it will affect the student's achievement of the assignment objectives and the course learning outcomes.

For cases that fall under excused absence regulations, the student or their representative should contact or go to the [Office of the Dean of Students \(ODOS\) website](#) to complete appropriate forms for instructor notification. Under academic regulations, excused absences may be granted by ODOS for cases of grief/bereavement, military service, jury duty, parenting leave, or emergent medical care. The processes are detailed, so the student should plan ahead.

13 Academic Integrity

Unless expressly allowed, students are expected to complete all exams and programming labs by themselves. **No use of AI tools is allowed for completing the programming labs and exams.** However, students are allowed to discuss general issues with other students (programming techniques,

clearing up confusion about requirements, etc.). Students may discuss particular algorithmic issues on Piazza (but they must not post or copy code!). If there is any doubt, students should contact the instructor. Course staff will be using software designed to catch plagiarism and use of AI tools in programming labs and copying on exams. A student is considered in violation of the academic honesty policy regardless of whether they are the one "copying" or the one "being copied from". Academic integrity is one of the highest values that Purdue University holds. Individuals are encouraged to alert university officials to potential breaches of this value by either emailing integrity@purdue.edu or by calling 765-494-8778. While information may be submitted anonymously, the more information is submitted the greater the opportunity for the university to investigate the concern. More details are available on the Academic Resources table on the Brightspace homepage. Punishments for academic dishonesty are severe, including receiving a failing grade in the course or being expelled from the university. By departmental rules, all instances of cheating will be reported to the Dean of Students. On the first instance of cheating on a programming lab or exam, students involved will receive a 0; the second instance of cheating will result in a failing grade in the course.

Use of Copyrighted Materials: All course materials, including lecture slides, practice problem sets, programming labs, exams, and solutions are subject to Purdue's copyright policies. Students must not share, distribute, or post any material on an online website without checking with the instructor.

14 Nondiscrimination Statement

Purdue University is committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters tolerance, sensitivity, understanding, and mutual respect among its members; and encourages each individual to strive to reach his or her potential. A hyperlink to Purdue's full Nondiscrimination Policy Statement is included in the Academic Resources table on the Brightspace homepage.

15 Accessibility

Purdue University strives to make learning experiences accessible to all participants. If the student anticipates or experiences physical or academic barriers based on disability, they are encouraged to contact the Disability Resource Center at: drc@purdue.edu or by phone: 765-494-1247, as soon as possible. If the Disability Resource Center (DRC) has determined reasonable accommodations that the student would like to utilize in this class, the student must release their Course Accommodation Letter to the instructor. Instructions on sharing the Course Accommodation Letter can be found by visiting: <https://www.purdue.edu/drc/students/course-accommodation-letter.php>. Additionally, the student is strongly encouraged to contact the instructor as soon as possible to discuss implementation of their accommodations.

15.1 Accommodated Testing

Students with disabilities whose DRC Course Accommodation Letter (CAL) includes test accommodations must first release their CAL to the instructor and then schedule to take their exams with Purdue Testing Services at <https://www.purdue.edu/studentsuccess/testing-services/accommodated-testing/student.php>. The student must schedule at least four days (96 hours) before the exam date listed on the syllabus. In the case of finals week, the student must schedule by the Friday before quiet period. The instructor will provide Purdue Testing Services with the exam, and they will proctor it and provide the result to the instructor for grading. Students must inform me immediately of cases when Purdue Testing Services is at capacity or otherwise unable to proctor the exam so that the

instructor can make other arrangements. Students who fail to follow this process and meet stated deadlines risk not being able to have their accommodations for that exam.

16 Mental Health/Wellness Statement

If a student finds themselves beginning to feel some stress, anxiety and/or feeling slightly overwhelmed, they should try [Therapy Assistance Online \(TAO\)](#), a web and app-based mental health resource available courtesy of Purdue Counseling and Psychological Services (CAPS). TAO is available to all students at any time by creating an account on the [TAO Connect website](#), or downloading the app from the App Store or Google Play. It offers free, confidential well-being resources through a self-guided program informed by psychotherapy research and strategies that may aid in overcoming anxiety, depression and other concerns. It provides accessible and effective resources including short videos, brief exercises, and self-reflection tools.

If a student needs support and information about options and resources, they should contact or see the [Office of the Dean of Students](#). Call 765-494-1747. Hours of operation are Mon–Fri, 8am–5pm.

If a student finds themselves struggling to find a healthy balance between academics, social life, stress, etc., they should sign up for free one-on-one virtual or in-person sessions with a [Purdue Wellness Coach at RecWell](#). Student coaches can help students navigate through barriers and challenges toward their goals throughout the semester. Sign up is free and can be done on BoilerConnect. Students in Indianapolis will find support services curated on the [Vice Provost for Student Life website](#).

If a student is struggling and needs mental health services: Purdue University is committed to advancing the mental health and well-being of its students. If a student or someone they know is feeling overwhelmed, depressed, and/or in need of mental health support, services are available. For help, such individuals should contact [Counseling and Psychological Services \(CAPS\)](#) at 765-494-6995 during and after hours, on weekends and holidays, or by going to the CAPS offices in [West Lafayette](#) or [Indianapolis](#).

17 TaskHuman Service

TaskHuman offers private, real-time, on-demand, 1-on-1 video calls with wellness coaches covering over 800+ topics such as anxiety, mindfulness, reducing stress, clean eating, time management, in-home workouts, relationship tensions, financial issues, spiritual guidance and many more. Students can access these wellness coaches from around the world 24/7. The College of Engineering has an exclusive agreement with TaskHuman which gives students FREE and UNLIMITED access to these resources. Learn more at: <https://engineering.purdue.edu/ECE/TaskHuman>.

Download TaskHuman



Scan the QR Code to download the TaskHuman App or download the TaskHuman App directly from the App Store or Google Play Store. Create an account – Go to Setting and tap on “Check for Discounts”, Insert the code: **purdue63**. Don’t see a topic you want or have other questions? Contact Brooke Parks, Senior Lecturer in ECE, at brookeparks@purdue.edu

18 Emergency Preparedness

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor's control. Relevant changes to this course will be posted onto the course web page and Piazza or can be obtained by contacting the instructor via email. Students are expected to check the course web page and Piazza, and read their @purdue.edu email on a frequent basis.

See Purdue's Information on [Emergency Preparation and Planning](#). This website covers topics such as Severe Weather Guidance, Emergency Plans, and a place to sign up for the Emergency Warning Notification System. Students are encouraged to download and review the [Emergency Preparedness for Classrooms document](#).

The first day of class, the instructor will review the **Emergency Preparedness plan for their specific classroom**. Students are advised to make note of the following items:

1. The location to where one will proceed after evacuating the building if one hears a fire alarm.
2. The location of the Shelter in Place in the event of a tornado warning.
3. The location of the Shelter in Place in the event of an active threat such as a shooting.