

Networks and Data Communications
CS 447-001 (CRN: [24056](#)) - Summer 2026

Welcome to CS 447!

Instructor: Dr. Hiroshi Fujinoki

Office: EB 2034

Office Phone: 650-3727

Email: hfujino@siue.edu

URL: www.siue.edu/~hfujino

Office Hours:

- (a) By online meetings: by appointment (should be made 24 hours in advance or the office hours will be made available based on the best-effort basis).
- (b) By emails: anytime (the worst-case turn-around time: 24 hours (except for weekends/holidays and during Fujinoki's conference presentation week) - for easy/simple questions).

Class Meeting Room: on-line meetings (synchronous*)

Class Meeting Days: T and R

Class Meeting Time: 11:00am-1:40p.m. (for both T and R lectures)

Note: item with "♣" symbol means an important item.

♣ Course Prerequisites:

CS340 (Data Structure and Algorithms) and CS314 (Operating Systems), or the instructor's permission. If you have not taken these courses, please talk to the instructor.

♣ Course Objectives:

This course is an introduction to computer networks. There are three objectives in this course. The first objective is to acquire fundamental knowledge about underlying mechanisms in computer networks. The second objective is to become proficient in essential network programming techniques such as sockets using TCP/IP and HTML

protocols through programming projects. The third objective is to be familiar with theoretical methods to analyze system performance of various aspects of computer networks. Since this course is an introductory course, much emphasis will be put in the first two objectives. By the end of the semester, students are expected to be proficient in networking programming with an insight to the underlying network mechanism.

♣ **Grading Policy:**

Activities:	Weight:	Final Letter Grade:	
Quizzes:	30%	100-90:	A
Project(s):	25%	89-80:	B
Homework:	18%	79-70:	C
Final Exam:	27%	69-60:	D
		Below 60:	F

Note 1: A total of six quizzes are planned in this course (5% of the course grade for each).

Note 2: A total of three projects are planned (subject to change) in this course.

Note 3: the time used in this syllabus is based on US CST

♣ **Exam:**

- The final exam is scheduled at 11:00 am (11:00am - 12:20pm) - it is a scheduled (synchronous exam).
- Makeup exam will be offered only for medical emergency (with a signed doctor's letter).

♣ **Projects (tentative plans - subject to change):** There will be three projects

Project 1 (5%): A client-server process using Winsock (the socket network APIs for Windows).

Project 2 (10%): Develop a multi-threaded application-level firewall using C/C++ socket. We are going to use Winsock for Win32 environment.

Project 3 (10%): Wireshark log analysis for detecting the network setting.

♣ Quizzes:

- There will be 6 quizzes during this course (5% each).
- Each quiz is scheduled at the end of the day (lecture day, synchronous) - unless otherwise announced.
- Quiz schedules are subject to change, depending on the lecture progresses, severe weather, and etc.

♣ Homework:

- There will be 6 homework during this course (3% each).
- After solutions for a homework are prepared (by each student), your solutions should be either typed and then should be emailed to hfujino@siue.edu by the submission due.
- Homework schedules are subject to change, depending on the lecture progresses, severe weather, and etc.

♣ Academic Dishonesty:

Following activities (but not limited to them) will be considered academic dishonesty:

I. Exam:

- Communicating (e-mails, phone calls, and texting, but not limited to them) with anyone (except the course instructor)) during exams.
- Using materials not allowed during exams.
- Anyone committing academic misconduct above (I-(a) or (b)) will receive a failing grade for this course and reported to the department chair as well as to the dean of the school of engineering.

II. Projects:

- (a) Submitting work totally or partially done by somebody else (this includes any human/electronic sources (such as web sites and even another course at SIUE) unless explicitly allowed by the course instructor).
- (b) Submitting program source code files (for the programming projects) that are developed by collaborations with other people. This includes both program designs and implementations.

- (c) Anyone committing academic misconduct above (II-(a) or (b)) can receive a failing grade for this course and reported to the department chair as well as to the dean of the school of engineering

♣ **Required Textbook:**

- James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach" (Eighth Edition), Addison-Wesley (ISBN: 9780133594140).

Other Required Skills/Knowledge:

- Experience with C/C++ (MS .NET or MS VC++)
- Knowledge of modern operating systems

♣ **Other Notices:**

- Every student is expected to check "Course Notices" in CS447 home at www.cs.siu.edu/~hfujino/SU2025_CS447_001/CS447_SEC1.html at least twice in a week.
- The instructor is NOT responsible for losing course credit by failing to use the information posted to the course home (including those when you do not check the CS447 home) or emails sent to each student.
- Each of you is expected to regularly check your SIUE emails. Some important messages may be sent to your SIUE e-mail address.
- For any grading problem, each student is expected to contact the course instructor within 10 days after the grade is posted or returned (failing to contact within 10 days may result in being unable to fix the problem).
- E-mails sent to the course instructor during weekends and holidays may take time before you receive a response.
- Any special arrangement agreed between you and the course instructor (Dr. Fujinoki) should be documented (i.e., emailed or posted to the course home). Any promises or agreements orally made between you and the course instructor may not take effect until one is documented (it is your responsibility to document any such promises and agreements).
- Ask your questions to the course instructor whenever you have anything you do not have a clear answer for. Please do not make your own assumptions (if

you do, you are responsible for any assumptions you make when they are not correct).

♣ Disability Support:

- Students who believe they may need accommodations in this class are encouraged to contact the office of Disability Support Services as soon as possible. It is the students' responsibility to alert the instructor to SIUE sanctioned accommodations. If anyone needs assistance from SIUE Disability Support Services, please contact them.

♣ **Tentative Class Schedule (subject to change, the lectures with * is by recording):**

This schedule is tentative and subject to change (see the course schedule posted for "Week #1 Weekly Notice" for the updates).

Week #: Day Topics

Week 1:	June 9 (T):	Course Introduction, circuit-switching and packet-switching networks OSI 7-layer model, packet-encapsulation Quiz-1 preview In-class exercises
	June 11 (R)*:	Network Protocols (protocols and interfaces) - as Teams meeting recording Local-area-network (LAN), Wide-Area-Network (WAN), the Internet and intra-net Local Area Networks, Bus, ring and star LAN, Repeaters, bridges and routers Homework #1 Issued
Week 2:	June 16 (T):	Project #1 description, socket programming tutorial Client-server architecture IP address and TCP port number Quiz-2 preview In-class Quiz #1 (covers the topics in Week 1) Homework #1 Due (email-submission due: 11:00AM on June 16)
	June 18 (R):	MAC address, IP address, and host name translation (DNS and ARP) In-class exercises Quiz-2 preview Homework #2 Issued
Week 3:	June 23 (T):	Project #2 description (multi-threaded application-layer proxy) In-class Quiz #2 (covers the topics in Week 2)
	June 25 (R):	LAN-Medium Access Control (IEEE Ethernet 802.1), CSMA, and CSMA-CD, None-persistent, 1-persistent, and p-persistent algorithms Homework #2 Due (email-submission due: 11:00AM on June 25)

- Week 4:** June 30 (T): Internet architecture (IP address structure)
Domain address, host address, CIDR-IP address
In-class Quiz #3 (covers the topics in Week 1)
- July 2 (R): TCP error and flow control (Stop-and-Wait ARQ)
TCP error and flow control (Selective-Reject & GBN ARQs)
TCP-slow start linear-growth flow-control
Homework #3 Issued
- Week 5:** July 7 (T): Dijkstra and Bellman-ford algorithms, distance-vector routing protocol
In-class exercises
Quiz-5 preview
In-lecture Quiz #4 (covers the topics in Week 4)
- July 9 (R): Internet routing, AS (Autonomous Systems), domains, and BGP
In-class exercises
Quiz-5 preview
Homework #4 Issued
Homework #3 Due (email-submission due: 11:00AM on July 9)
- Week 6:** July 14 (T): Hardware-based error controls: bit-errors, parity and CRC error detection
In-class exercises
Quiz-6 preview
In-lecture Quiz #5 (covers the topics in Week 5)
- July 16 (R): Network Security (network security fundamentals, asynchronous cryptography, digital signature, digital certificate)
In-class exercises
Quiz-6 preview
Homework #5 Issued
Homework #4 Due (email-submission due: 11:00AM on July 16)
- Week 7:** July 21 (T): Project #3 description, Wireshark network packet-capturing tool
In-lecture Quiz #6 (covers the topics in Week 5)
- July 23 (R): Topics TBA
Homework #6 Issued
Homework #5 Due (email-submission due: 11:00AM on July 23)
- Week 8:** July 28 (T): Topics TBA
- July 30 (R): Final Exam

It is expected that each student voluntarily studies not only the required sections but other related sections or materials.

- Required reading should be done before the lecture.
- If you have any problem for the above schedule, please contact to Dr. Fujinoki as soon as possible.
- Any question regarding this syllabus should be addressed to: hfujino@siue.edu