

Spring 2023 - 2024

## Overview

This is an introductory course of distributed systems. Topics include the architecture of distributed systems; networking; datagram-oriented and stream-oriented protocols; network programming; remote procedure call and remote method invocation; processes and threads; peer-to-peer systems; basic cryptography and security.

## Instructor

**Dr. Zhen Huang**

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## Office hours

**My office hours for this course are held via zoom and their details are posted on the course web page on D2L.** You may also come to my office hours in person. I encourage you to get help if you need it. Asking questions about the assessments or other course materials can improve your understanding enormously. I will not judge you for needing help. I will help you.

## Prerequisites

You must have taken CSC 403 and CSC 407.

## Learning goals

After the successful completion of this course:

- you will understand the architecture of distributed systems;
- you will understand TCP/IP protocols;
- you will understand DNS, HTTP, and FTP protocols;
- you will understand how local area networks and Internet work;
- you will understand basic cryptography and TLS protocols;
- you will be able to develop networking programs;
- you will be able to develop multi-threading programs;
- you will be able to develop distributed systems;

## Course materials

**The course materials are hosted on the course web page on D2L, while the course discussion forum is hosted on Discord.** The course materials consist of lecture videos, lecture slides, homework assignments, quizzes, exams, and links to online resources. **Note that you are expected to check the course web page and the discussion forum regularly.**

Each week you are assigned lecture videos to watch. Some practice problems are usually listed at the end of each lecture video. Solving these practice problems is important for you to master course materials. You are expected to complete these practice problems after watching the lecture videos, although they are not graded.

Participation on the course discussion forum is another important part of the course. Particularly answering the questions of other students on the discussion forum is highly encouraged as that will not only help other students but also improve your own understanding of the course materials.

You must make sure that you have the necessary technical resources needed to access the course content and complete class activities. You will need:

- Frequent and continued access to a computer that connects to the Internet.
- A working e-mail account that you check regularly (and that is updated in Campus Connection).
- Access to a software suite such as Microsoft Office (Word, Excel, Power Point).
- The ability to view video files, either in a streaming (Flash) or other common formats (QuickTime, iTunes, 3GP, etc.).
- A webcam on a computer installed with Respondus Lockdown Browser to take exams.

## Contacting me

Please get in touch if you have questions or would like to schedule a meeting outside office hours. **Email is the best option.** I respond quickly when possible, but my policy is that **you should receive a response by the next business day** (i.e. an email sent to me on Tuesday gets a response by Wednesday night). **Please ensure you put "CSC 435" in the subject line of your email to avoid any delays**, as my emails are automatically categorized by the subject line.

Additionally, please do not email me questions to which the answer is right here on the syllabus (e.g. when is the midterm?) or posted in a note on the D2L page. I may not answer such emails, so if you do not receive a response, double-check that the answer is not easy to find.

## Course calendar

The following gives all the important dates for this course. The topics covered are subject to change.

Week	Topic/Deadline
1	Introduction to Distributed Systems; Input/Output in C; Java Streams
2	Sockets; Application Layer Protocols
3	Threading and Concurrency
4	Local Area Network (LAN); Internet; Domain Name System (DNS)
5	<b>Midterm exam</b> , Internet Protocol (IP); HTTP
6	HTTP (cont.); FTP
7	Transport/Network Layer Protocols; Routing
8	Remote Procedure Call; XML-RPC; Remote Method Invocation (RMI)
9	Basic Cryptography; Transport layer Security (TLS)
10	Secure Sockets; Firewalls; Peer-to-Peer Systems
11	<b>Final exam</b>

## Textbooks

Elliott Rusty Harold, *Java Network Programming, 4th Edition*, O'Reilly Media, Inc., 2013. ISBN: 9781449365950

## Grading

Course assessments include homework assignments, quizzes, a midterm, and final exam. The course grade will be computed as follows:

Assessment	Percentage
Homework assignments	35 %
Quizzes	15 %
Midterm exam	25 %
Final exam	25 %

The final grade in the course will be determined according to the standard D2L grading scheme:

A	95-100%	C	73-76%
A-	91-94%	C-	69-72%
B+	88-90%	D+	65-68%
B	85-87%	D	61-64%
B-	81-84%	F	<61%
C+	77-80%		

**I will grade your submitted work within 7 days of the due date.** To do well in this course, you should follow the class regularly, participate in the discussion, read the chapters in the book each week as indicated in the homework assignments, start working on the homework early, and talk to me promptly if you have any problems. The answers to the homework and exam questions, as well as your code, should be written in a way that is rigorous, clear and concise.

## Homework assignments

There will be a total of 5 homework assignments, but only the four highest graded ones will be contributed to your final grade, i.e. your lowest-graded homework assignment will automatically be dropped. Each homework assignment will consist of several programming assignments, and/or conceptual problems.

**All homework assignments are to be submitted to D2L.** The details on how to make the submissions are described in the document for each assignment on the course web page on D2L. All homework assignments must be submitted by the deadline and no later. Any homework not handed in by the deadline will receive 0 points, without any exceptions.

## Quizzes

There will be 5 quizzes that focus on conceptual questions and test on basic skills. In addition, there is a syllabus quiz that tests your understanding of the syllabus. The quizzes are in the form of D2L quizzes composed of multiple-choice questions, multiple-select questions, short-answer questions, matching questions, and filling-the-blank questions. For each quiz, you can choose a time to take it in a period specific to the quiz.

## Midterm and final exams

Both the midterm and the final are in the form of D2L quizzes that require the use of the Respondus Lockdown Browser.

**Make-up exams will not be given.** If you wish to petition for a make-up exam, you must notify me at least one week in advance and provide documented evidence of the emergency that will cause you to miss the exam. Failure to contact me in advance of the exam date and time will disqualify you from being allowed to take a make-up exam.

## Lateness and absence

Submitting homework and quizzes on time is crucial for students to keep up with the pace of the course and get feedback in a timely manner. However, to accommodate unexpected situations, **late homework can be submitted within a 72-hour period after the due date, but will receive a 25% per day penalty as below:**

- the homework will get 75% of the credit if it is submitted within 24 hours after the due date
- the homework will get 50% of the credit if it is submitted after 24 hours but within 48 hours after the due date
- the homework will get 25% of the credit if it is submitted after 48 hours but within 72 hours after the due date

**No homework will be accepted after the 72-hour period. No late quiz will be accepted.** If you don't hand in a quiz in time, you will receive 0 points for the quiz.

## Feedback for me

### Online course evaluations

Evaluations are a way for students to provide valuable feedback regarding their instructor and the course. Detailed feedback will enable the instructor to continuously tailor teaching methods and course content to meet the learning goals of the course and the academic needs of the students. They are a requirement of the course and are key to continue to provide you with the highest quality of teaching. The evaluations are anonymous; the instructor and administration do not track who entered what responses. A program is used to check if the student completed the evaluations, but the evaluation is completely separate from the student's identity. Since 100% participation is our goal, students are sent periodic reminders over three weeks. Students do not receive reminders once they complete the evaluation. Students complete the evaluation online in Campus Connect: <http://campusconnect.depaul.edu/>

### Other feedback

After the midterm exam, the midterm course feedback on D2L will be available for you to provide anonymous feedback to me. You can also email me feedback about the course. I work hard to make the course effective and interesting. If you let me know what worked for you and what didn't, I may be able to improve the course. Even if I cannot do that in time to help you, future students will appreciate your time. I will too.

## Policies

### Mental health and academic assistance

Balancing the hard work of achieving your educational goals with the other demands of life is difficult at the best of times. For many of us, for a variety of reasons, things are all the more difficult now. I want to make sure you feel comfortable, not embarrassed, reaching out to me for support. I will also point out where the University has great resources just a phone call or email away. These have been created and maintained for you, so use them. Sometimes people feel like their situation isn't the worst possible, so they assume they do not need help, but don't let that prevent you from reaching out.

- DePaul University Counseling Services – mental health is as important as physical health, and we have professionals just a phone call away: <https://offices.depaul.edu/student-affairs/support-services/counseling/Pages/default.aspx>. In emergency, please call (773) 325-7779 or 911.
- The Dean of Students Office can help you with a wide range of topics, including figuring out if you should withdraw or apply for an incomplete: <https://offices.depaul.edu/student-affairs/about/departments/Pages/dos.aspx>.
- There are lots of additional, more specific resources listed here with the Office of Student Affairs, including crisis hotlines and sexual assault resources (note Title IX refers to a law protecting you from sex discrimination, including harassment and assault): <https://offices.depaul.edu/student-affairs/support-services/counseling/Pages/Crisis-Hotlines.aspx>.

### Changes to syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted under Announcements in D2L and sent via email.

## **Academic integrity and plagiarism**

This course will be subject to the university's academic integrity policy. More information can be found at <http://academicintegrity.depaul.edu/>.

All students are required to manage their class schedules each term in accordance with the deadlines for enrolling and withdrawing as indicated in the University Academic Calendar. Information on enrollment, withdrawal, grading and incompletes can be found at: <http://cdm.depaul.edu/enrollment>.

## **Incomplete grades**

An incomplete grade is a special, temporary grade that may be assigned by an instructor when unforeseeable circumstances prevent a student from completing course requirements by the end of the term and when otherwise the student had a record of satisfactory progress in the course. All incomplete requests must be approved by the instructor of the course and a CDM Associate Dean. Only exceptions cases will receive such approval. Information about the Incomplete Grades policy can be found at <http://www.cdm.depaul.edu/Current%20Students/Pages/Grading-Policies.aspx>

## **Students with disabilities**

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: [csd@depaul.edu](mailto:csd@depaul.edu). Lewis Center 1420, 25 East Jackson Blvd. Phone number: (312)362-8002 Fax: (312)362-6544 TTY: (773)325.7296