CSC 376   Distributed Systems

Spring 2022 - 2023

Overview

This course introduces 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.

Instructor

Professor: **Zhen Huang**

> Office: Room 735, CDM Center, DePaul University
> Phone: (312) 362-8239
> Email: zhen.huang@depaul.edu
> Homepage: https://facsrv.cs.depaul.edu/~zhuang28

I will reply to all student emails and voice mails within one business day. Please ensure you put "CSC 376" in the subject line of your email to avoid any delays. I will answer emails twice a day during weekdays: once in the noon and once in late afternoon.

Course materials

This course materials are on D2L, DePaul's Learning Management System (LMS), 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. 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.

Synchronous Zoom Meetings

For students in the asynchronous online section, I will hold weekly synchronous zoom meetings from 11:30am to 12:30am on Wednesdays (starting from Week 2), in which I will review homework, quizzes, or exam, and answer your questions. Occasionally I will present interesting topics not covered in the lectures in these meetings. Attending these meetings is encouraged but optional. The meetings will be recorded and the recordings will be posted on D2L.

Office hours

My office hours for this course are held via zoom as follows.

- 3:30pm -- 5:30pm Tuesdays
- 1:30pm -- 2:30pm Wednesdays

The link to the zoom meetings is posted on the course web page on D2L.

Please make use of my office hours. Asking questions about the assessments, course notes, or the readings can improve your understanding enormously. It will also let me know if I need to review a topic with the class. If you want to talk to me during my office hours but are unable to do so for any reasons, please contact me to make an appointment outside those hours.

Course website

The course lecture videos, lecture slides, homework assignments, and other course materials are located on the course web page on D2L. The course discussion forum is located on Discord. Please check the course web page and the discussion forum regularly.

Prerequisites

You must have taken CSC 301 and CSC 374.

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, TLS protocols;
- you will understand how local area networks and Internet work;
- 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 calendar

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

Week	Date	Topic/Deadline
1	Monday, March 27 -- Sunday, April 2	IIntroduction to Distributed Systems; Input/Output in C; Java Streams
2	Monday, April 4 -- Sunday, April 9	Sockets; Application Layer Protocols
3	Monday, April 10 -- Sunday, April 16	Threading and Concurrency
3	Monday, April 10	*The last day to drop classes with no penalty*
4	Monday, April 17 -- Sunday, April 23	Network Basics; Internet
5	Monday, April 24 -- Sunday, April 30	**Midterm exam**, Domain Name Services (DNS); HTTP
6	Monday, May 1 -- Sunday, May 7	HTTP (cont.); Routing; Transport/Network Layer Protocols
7	Monday, May 8 -- Sunday, May 14	Transport/Network Layer Protocols (cont.)
7	Friday, May 12	*Last day to withdraw from classes*
8	Monday, May 15 -- Sunday, May 21	Scalability; Remote Method Invocation (RMI); BitTorrent
9	Monday, May 22 -- Sunday, May 28	Firewalls; Transport layer Security (TLS)
10	Monday, May 29 -- Sunday, June 4	IPSec; Authentication and Authorization
11	Monday, June 5 -- Friday, June 11	**Final exam**

Textbooks

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

Grading policy

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. Each homework assignment will consist of several programming assignments, and/or conceptual problems.

Quizzes

There will be 5 quizzes that focus on conceptual questions and test on basic skills. The quizzes are in the form of D2L quizzes composed of multiple-choice 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 of 3 days specific to the quiz.

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.

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

No late homework or quiz will be accepted. If you don't hand in a homework/quiz in time, you will receive 0 points for the homework/quiz.

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.

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/

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/.

Academic policies

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. Lewis Center 1420, 25 East Jackson Blvd. Phone number: (312)362-8002 Fax: (312)362-6544 TTY: (773)325.7296