

CSC 406 - 803 Systems I

Winter 2022 - 2023

Overview

This course is the first of a two-course sequence covering the concepts underlying all computer systems and how they affect the correctness, performance, and utility of application programming. This course introduces C programming and focuses on machine representation of information and programs.

Instructor

Professor: Zhen Huang

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I will reply to all student emails and voice mails within one business day. Please ensure you put "CSC 406" 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 format

To provide optimal experience for students, this course will be delivered in a hybrid model as follows:

- **Course website:** The course web site is on D2L. It hosts the lecture slides, the asynchronous lecture videos, the live lecture recordings, and the homework, quizzes, and lab assignments. Please check the course web page and the discussion forum regularly.
- **Asynchronous lecture videos:** The asynchronous lecture videos are pre-recorded.
- **In-person sessions:** The course section includes three one-and-half-hour in-person sessions. **In these sessions, I will present short tutorials and go through hands-on practice with you, which will prepare you for homework and labs.** These sessions will be held in **CDM 224 from 5:45pm to 7:15pm on the following days.**
 - January 10th
 - February 7th
 - March 7th
- **Synchronous zoom meetings:** I will review the homework assignments and labs due that week and **occasionally present interesting topics not covered in lectures in synchronous zoom meetings.** These meetings will be held **from 9am to 10am on Thursdays.** The link to these meetings will be posted on D2L. Students are encouraged to attend these meetings, although the attendance is optional. The synchronous zoom meetings will be recorded and posted on D2L.
- **Discussion forum:** I have set up a Discord server as the discussion forum for the class. Please use it to ask questions relevant to the class. I also encourage you to answer other students' questions. The Discord server invite is posted on D2L. I am also available for one-on-one Zoom meetings during my virtual office hours. If you need to contact me outside of office hours, feel free to email me directly.

Office hours

My office hours are held via zoom meetings as follows.

- 1pm to 3pm on Tuesdays
- 11am to 12pm on Wednesdays

The link to the zoom meetings is posted on the course website.

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 but are unable to make office hours, please contact me to make an appointment outside those hours.**

Prerequisites

You must have taken CSC 401 or an equivalent intro to programming course. I will assume that:

- You know how to create, debug, compile and run programs in a general-purpose language (Python, Java, C, C++,...) and use a reasonable programming style (i.e. your code is easy to read and concise).
- You know how to use basic data types (integer, boolean, and string) including fundamental container data types (arrays or lists).
- You are familiar with execution control structures such as if/else, for, and while statements.
- You are familiar with basic formal logic.

Learning goals

After the successful completion of this course:

- you will have basic C programming skills;
- you will understand how integers, strings, arrays and other structures are represented and manipulated at the machine level;
- you will understand how programs are represented at the machine-level;
- you will be able to read, understand, and debug 64-bit Intel Assembly code in GAS (GNU Assembler) format;
- you will know how to take advantage of the parallelism in modern CPUs to optimize program performance;

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, January 2 -- Sunday, January 8	Intro to computer systems, UNIX, and C
2	Monday, January 9 -- Sunday, January 15	Machine representation of data
	Sunday, January 15	<i>The last day to drop classes with no penalty</i>
3	Monday, January 16 -- Sunday, January 22	Integer arithmetic
4	Monday, January 23 -- Sunday, January 29	C arrays, strings, pointers, and structures
5	Monday, January 30 -- Sunday, February 5	Midterm exam , Intro to machine representation of programs
6	Monday, February 6 -- Sunday, February 12	Machine representation of programs
7	Monday, February 13 -- Sunday, February 19	Arithmetic and logical operations; control
	Sunday, February 19	<i>Last day to withdraw from classes</i>
8	Monday, February 20 -- Sunday, February 26	Procedures; arrays and pointers; buffer overflow
9	Monday, February 27 -- Sunday, March 5	Intro to optimizing program performance
10	Monday, March 6 -- Sunday, March 12	Optimizing program performance
11	Monday, March 13 -- Friday, March 17	Final exam

Textbooks

Bryant & O'Hallaron, *Computer Systems: A Programmer's Perspective, 3rd Edition*, Prentice Hall/Pearson, 2016. ISBN: 9780134092669

Kochan, *Programming in C, 4th Edition*, Prentice Hall/Pearson, 2015. ISBN: 9780321776419

Grading policy

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

Assessment	Percentage
Homework assignments	16 %
Quizzes	10 %
Lab projects	24 %
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 and labs 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 your best 4 count toward the final grade, so you may miss one homework with no penalty. Each homework assignment will consist of several short 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.

Lab projects

There will also be a total of 3 labs, each a *major* assignment involving long hours of technical work.

All homework assignments and labs are to be submitted to a course Linux server. The details on how to make the submissions are described in the document for each assignment and lab on the course web page on D2L. All homework assignments and labs must be submitted by the deadline and no later. Any homework or lab 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. **Students must follow [CDM exam proctoring policies](#) to schedule and take proctored midterm between January 31st and February 2rd, and proctored final between March 14th and March 16th.**

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, quiz, or lab will be accepted. If you don't hand in a homework/quiz/lab in time, you will receive 0 points for the homework/quiz/lab.

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