

CSC 373 - 520 Computer Systems I

Winter 2021 - 2022

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 373" as the subject line of your email. I will answer emails twice a day during weekdays: once in the noon and once in the evening. I will not be available during weekends, while the course materials are available 24/7.

Course format

The course is taught entirely online in an asynchronous mode with optional synchronous zoom meetings. Asynchronous means that you will not have to be online at a specific time. You can progress through weekly content at your own pace. However, please keep in mind there will be deadlines to complete assignments, quizzes, labs, and exams. Your participation in this online course will equal, or exceed, that of a typical face-to-face class.

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.

This online course is taught 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, lab 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.

Synchronous Zoom Meetings

I will hold weekly synchronous zoom meetings from 1pm to 2pm on Thursdays, in which I will review homework, quizzes, or exam, and answer your questions. The meetings will be recorded and the recordings will be posted on D2L. **Attending these meetings is recommended but optional.**

Office hours

My office hours for this course are held via zoom meetings between 3:00pm to 6:00pm on 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, lab 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 393 or CSC 300) and Math 140. 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 3 -- Sunday, January 9 | Intro to computer systems, UNIX, and C |
| 2 | Monday, January 10 -- Sunday, January 16 | Machine representation of data |
| | Sunday, January 16 | <i>The last day to drop classes with no penalty</i> |
| 3 | Monday, January 17 -- Sunday, January 23 | Integer arithmetic |
| 4 | Monday, January 24 -- Sunday, January 30 | C arrays, strings, pointers, and structures |
| 5 | Monday, January 31 -- Sunday, February 6 | Midterm exam , Intro to machine representation of programs |
| 6 | Monday, February 7 -- Sunday, February 13 | Machine representation of programs |
| 7 | Monday, February 14 -- Sunday, February 20 | Arithmetic and logical operations; control |
| | Sunday, February 20 | <i>Last day to withdraw from classes</i> |
| 8 | Monday, February 21 -- Sunday, February 27 | Procedures; arrays and pointers; buffer overflow |
| 9 | Monday, February 28 -- Sunday, March 6 | Intro to optimizing program performance |
| 10 | Monday, March 7 -- Sunday, March 13 | Optimizing program performance |
| 11 | Monday, March 14 -- Friday, March 18 | 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 final are proctored D2L quizzes. **Note that you will need to use the Respondus Lockdown Browser to take both the midterm and the final.** The proctored midterm exam must be taken between February 1st and February 3rd, and the proctored final exam must be taken between March 15th and March 17th. **Students need to schedule CDM proctored exams on D2L. If you choose to come to the campus to take proctored exams, you must have vaccination documentation or an exemption on file.**

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