

CSC 406 - 820 Systems I

Winter 2020-2021

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

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 406" 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. 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 quizzes and exams.

This online course is taught on [D2L](#), DePaul's Learning Management System (LMS), while the course discussion forum is hosted on [piazza](#). Participation on the course discussion forum is an 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.

Office hours

My office hours for this course are held via web meetings between 11:00am to 12:30pm on Mondays.

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 [piazza](#). Please check the course web page and the discussion forum regularly.

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;
- you will be able to take CSC 407, the follow-up systems course.

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 4, 2020 -- Sunday, January 10, 2020	Intro to computer systems, UNIX, and C (BO Ch. 1 and K Ch. 1-5, 7)
2	Monday, January 11, 2020 -- Sunday, January 17, 2020	Machine representation of data (BO Ch. 2 and K Ch. 11)
	Sunday, January 17, 2020	<i>The last day to drop classes with no penalty</i>
3	Monday, January 18, 2020 -- Sunday, January 24, 2020	Integer arithmetic (BO Ch. 2 and K Ch. 11)
4	Monday, January 25, 2020 -- Sunday, January 31, 2020	C arrays, strings, pointers, and structures (K Ch. 6, 8-10)
5	Monday, February 1, 2020 -- Sunday, February 7, 2020	Midterm exam , Intro to machine representation of programs (BO Ch. 3)
6	Monday, February 8, 2020 -- Sunday, February 14, 2020	Machine representation of programs (BO Ch. 3)
7	Monday, February 15, 2020 -- Sunday, February 21, 2020	Arithmetic and logical operations; control (BO Ch. 3)
	Sunday, February 21, 2020	<i>Last day to withdraw from classes</i>
8	Monday, February 22, 2020 -- Sunday, February 28, 2020	Procedures; arrays and pointers; buffer overflow (BO Ch. 3)
9	Monday, March 1, 2020 -- Sunday, March 7, 2020	Intro to optimizing program performance (BO Ch. 5)
10	Monday, March 8, 2020 -- Sunday, March 14, 2020	Optimizing program performance (BO Ch. 5)
11	Monday, March 15, 2020 -- Friday, March 21, 2020	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, quizzes, 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 exam and final exam are in the form of D2L quizzes. Similar to the quizzes, you can choose a time to take each exam in a period of 3 days specific for the exam.

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