CSC 406-901/910   Systems I

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 focuses on C programming and machine representation of information and programs.

Instructor

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Class hours

Spring 2020

The course is taught remotely, so there are no class hours. **Pre-recorded lecture videos will be released on D2L every Monday.**

Office hours

Mondays 5:30pm - 6:30pm
Tuesdays 2pm - 2:30pm

I am available in office hours by **zoom meeting** and e-mail. Since students may be present in zoom meetings during those hours, it is possible that there will be some delay before I respond to e-mail.

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

This syllabus, as well as the class lecture notes, homework assignments, lab assignments, discussion forum links, homework submission link and other links can be found on the course web page. Please check this site 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).
- Your 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, March 30, 2020	Intro to computer systems, UNIX, and C (BO Ch. 1 and K Ch. 1-5, 7)
2	Monday, April 6, 2020	Machine representation of data (BO Ch. 2 and K Ch. 11)
3	Monday, April 13, 2020	Integer arithmetic (BO Ch. 2 and K Ch. 11)
	Monday, April 13, 2020	*The last day to drop classes with no penalty*
4	Monday, April 20, 2020	C arrays, strings, pointers, and structures (K Ch. 6, 8-10)
5	Monday, April 27, 2020	**Midterm exam: 5:45pm - 7:45pm**
	Monday, April 27, 2020	Intro to machine representation of programs (BO Ch. 3)
6	Monday, May 4, 2020	Discussion of the midterm and Machine represention of programs (BO Ch. 3)
7	Monday, May 11, 2020	Arithmetic and logical operations; control (BO Ch. 3)
	Friday, May 15, 2020	*Last day to withdraw from classes*
8	Monday, May 18, 2020	Procedures; arrays and pointers; buffer overflow (BO Ch. 3)
9	Monday, May 25, 2020	Optimizing program performance (BO Ch. 5)
10	Monday, June 1, 2020	Optimizing program performance (BO Ch. 5)
11	Monday, June 8, 2020	**Final exam 5:45pm - 8:45pm**

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, lab projects, a midterm, and final exam. The course grade will be computed as follows:

Assessment	Percentage
Homework assignments	20 %
Lab projects	30 %
Midterm exam	25 %
Final exam	25 %

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 homeworks, 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.

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 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

The midterm and final exams will be cumulative. The midterm exam will take place on Monday, April 27, 2020, 5:45pm - 7:45pm using a D2L quiz. The final exam will take place on Monday, June 8, 2020 5:45pm - 9:00pm also using a D2L quiz. **Note that both the midterm exam and the final exam require the use of Respondus**

Lockdown Browser.

Make-up exams will not be given. If you wish to petition for a make-up exam, you must notify me 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. If a make-up exam is granted, it will be of a form of my choosing.

Lateness and Absence

No late homework or lab will be accepted. If you don't hand in a homework/lab in time, you will receive 0 points for the homework/lab. Midterm and final exams makeups must be arranged at least one week in advance, barring extreme situations.

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

The course adheres to the DePaul University's Academic Integrity Policy. For complete information about Academic Integrity at DePaul University, please see: http://academicintegrity.depaul.edu/.

Cheating is any action that violates university norms or instructor's guidelines for the preparation and submission of assignments. This includes, but is not limited to, unauthorized access to examination materials prior to the examination itself; use or possession of unauthorized materials during the examination or quiz; having someone take an examination in one's place; copying from another student; unauthorized assistance to another student; or acceptance of such assistance. Plagiarism involves the presentation of the work of another as one's own. Plagiarism includes, but is not limited to the following: the direct copying of any source, such as written and verbal material, computer files, audio disks, video programs or musical scores, whether published or unpublished, in whole or part, without proper acknowledgment that it is someone else's; copying of any source in whole or part with only minor changes in wording or syntax, even with acknowledgment; submitting as one's own work a report, examination paper, computer file, lab report or other assignment that has been prepared by someone else (including research papers purchased from any other person or agency); the paraphrasing of another's work or ideas without proper acknowledgment; working so closely with another person so as to produce identical code.

The use of others' web/publication content (text, graphics, code) is regarded as plagiarism if credit is not given (see the above description of plagiarism). When you directly quote someone's work, you must put it in quotation marks. Without such quotations and reference, it is regarded as an act of plagiarism (see the above description of plagiarism). Using materials that the student prepared for other purposes (e.g., for another course or for his/her work) needs the course instructor's prior permission.

A charge of cheating and/or plagiarism is always a serious matter. It can result in an automatic F in the course and possible expulsion.

Incomplete

An incomplete grade is given only for an exceptional reason such as a death in the family, a serious illness, etc. Any such reason must be documented. Any incomplete request must be made at least two weeks before the final, and approved by the Dean of the College of Computing and Digital Media. Any consequences resulting from a poor grade for the course will not be considered as valid reasons for such a request.