CS 253: Systems Programming
Spring 2021
TTh 9:00-10:15, Lab M 3:00-5:45

Instructor Information

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Office Hours: Monday 2:00-3:00, Thursday 10:30-11:30
Course Website: `http://isoptera.lcsc.edu/~seth/cs252`

Course Description

Detailed overview of software development on unix-like operating systems with an emphasis on systems programming using C, C++, or an equivalent systems programming language. This includes an introduction to command-line usage and scripting using a common shell. Students will learn about mechanisms available on POSIX-compliant platforms such as signals, pipes, and file descriptors. Pre-requisite: CS211 with a grade of C or better.

Learning Outcomes

At the end of the course, students should understand:

- How to operate a command-line interface.
- How Unix-like operating systems such as Linux are structured.
- C memory management, including pointer arithmetic and heap allocation
- The basics of unix programming using C, including signals, fork/exec, pipes, and related constructs

Textbook

"The Linux Command Line", William Shotts, second edition. Available for free (.pdf only) from `http://linuxcommand.org`

Grading

Your grade will be calculated based on the following items:

Item	Percentage of grade
Exam 1	20%
Exam 2	20%
Lab	10% total
Quiz	10% total
Projects	40% total

Grades will be assigned according to a standard curve, that is:

A: 90% +
B: 80%- 90%
C: 70%- 80%
D: 60%- 70%
F: less than 60%

Use of + or - grades (such as B+ or A-) and curves will be at the instructor's discretion.

Deadlines and late work

Late work will not be accepted except by instructor discretion. However, partial credit will be given for partially-completed work. It is better to turn in an unfinished assignment for partial credit than to not turn in something on time and receive a 0.

Attendance

Attendance will not be taken in this class except as required for financial aid purposes. However, all material presented during lecture is "fair game" for the midterm and final, and some of this material may not be in the book as well. There is also the potential for quizzes in class, which cannot be made up. Therefore I recommend that you always attend class.

Academic Dishonesty

Cheating on any assignment will result in failing the class. Some things which constitute cheating in this class are:

- Copying another student's homework
- Turning in homework created by another student
- Reading another student's answers on a test
- Sharing all or part of your completed homework with another student before the assignment is due

Appropriate collaboration on homework involves sharing ideas with other students only, not source code! Although it is often tempting to help another student by showing them how your completed program, script, or command works, this is not helpful to their learning. However, this does not mean you cannot collaborate with other students on homework. Sharing of ideas, principles, and algorithms is permitted and encouraged.

Tentative Course Calendar

Note 1: Because the college response to COVID-19 has shifted several times, the schedule as it stands may be more variable than would be expected in a normal semester. I will do my best to inform the class of changes in schedule or teaching method by e-mail.

Note 2: Students often take CS253 and CS211 at the same time, which is fully supported. The schedule below emphasizes C once students taking CS211 have had some time to learn the basics of C++. To begin working in the right direction, we'll add in a little bit of C each week starting at the beginning, so that everyone is ready when the class re-focuses on C after exam 1.

CS253 Systems Programming Spring 2021 Calendar		
Week	**Course Content**	**Relevant Chapters**
Jan 18	Introduction to Linux, file tree, terminals, SSH	1-3
Jan 25	Input redirection, pipes, more command line usage	4-6
Feb 1	Permissions, more advanced shell usage	7-9
Feb 8	Variables Processes and process management, OS structure	10 and 11
Feb 15	Package Management, Installing Programs, Software Development	14 and 22
Feb 22	Networking	16
Mar 1	Finding things, archiving, backups	17, 18
Mar 8	Regular Expressions and Text Processing	19, 20
Mar 15	Exam 1 and Answers	
Mar 22	C Memory Management	TBD
Mar 29	Fork/exec process management	TBD
Apr 5	Pipes and File Descriptors, Signals	TBD
Apr 12	Remaining C programming topics	TBD
Apr 19	Exam 2 and answers	TBD
Apr 26	Spring Break! No class all week	
May 3	No regular lecture, week is dedicated to finishing projects	
May 10	Final Project Due Thursday, May 14, at 9:00 AM	