CSC415 OPERATING SYSTEM PRINCIPLES

FALL 2017

UNIX is basically a simple operating system, but you have to be a genius to understand the simplicity.

~Dennis Ritchie

Instructor:	Hao Yue
Class Time/Location:	Monday and Wednesday, 4:10PM-5:25PM, Thornton Hall 432
Office:	TH 930
Office Hours:	Monday and Wednesday 11:00AM-12:00PM, or by appointment
Email:	haoyue@sfsu.edu
TA:	Rui Feng
Email:	ruif@mail.sfsu.edu

Pre-requisite:	Grades of C or better in MATH 324, CSC 256, CSC 340; a good working knowledge of the C programming language
Textbook:	Operating System Concepts Essentials, 2nd Edition Abraham Silberschatz, Peter B. Galvin, and Greg Gagne

Course Description

This course introduces the fundamental concepts and principles on design and implementation of operating systems (OS's). Topics covered in this course include OS Structure, System Calls, Processes, Threads, Inter-Process Communications, CPU Scheduling, Process Synchronization, Memory Allocation, Virtual Memory, Disk Management, File Systems, and other emerging topics.

Learning Outcomes

At the end of this course, students will

- Understand the rationale behind the design principles and implementation of modern OS's
- Gain hands-on experience in OS programming

Course Expectations

The students are expected to attend every class, actively and constructively participate in

class discussions, do the readings assigned for class, and complete all homework and coding assignments on time.

Grading
The grading policy is as follows:

- 10% Attendance and Quizzes
- 10% Homework Assignments
- 45% Coding Assignments
- 35% Final Exam

At the end of the semester, each student will receive a final score out of 100, which will then be converted to a letter grade based on a class curve.

Assignments
There will be two homework assignments and six coding assignments in this course. Each homework assignment counts for 5% of the final grade. The first coding assignment counts for 5% of the final grade, and each of the other five coding assignments counts for 8%. All assignments are due at the announced deadlines. Students are allowed to make late submission within 48 hours of an assignment deadline, for 75% of the credits. Submissions later than that will not be accepted, and it will result in a zero for that assignment.

Exams
The course will have one final exam. The exam is closed-book and closed-notes. Students will be responsible for material covered both in the readings and in the lectures. Attendance is therefore recommended as not all class discussions will be covered in the text. If you are unable to attend the final exam, you MUST contact the instructor at least one week before the exam. If you have acceptable and documented excuses, you may be given a make-up exam. Any other exam absence will result in a zero for that grade.

Attendance and Quizzes
Attending classes regularly is required. There will be five roll-calls in this semester, and each of them counts for 1% of the final grade.

Quizzes will be assigned sporadically throughout the term and test comprehension of the previous class, which count for 5% of the final grade in total. Being late for or missing a quiz without an extremely sound reason will result in a zero for it.

Class participation will be a measure of contributing to the discourse through discussion and questions, both inside and outside of class. The goal is for thoughtful contributions that show engagement with the material. Students actively participating in class will receive up to 5 bonus points in the final grade.

Academic Integrity Policy

Cheating and plagiarism are serious violations of the academic code of conduct. Students who have been found to be cheating with be notified by the professor. Furthermore their act will be reported to the Office of Student Conduct (OSC). Please consult the departmental policy on plagiarism/cheating at http://cs.sfsu.edu/plagarism.html.

Students are not allowed to share their homework solutions or any work with other students, unless permission from the instructor is given. Submitting someone else's work as your own is considered cheating. Letting someone else submit your work as her/his own is also considered cheating, and will be treated equally.

If you wrote your code on your own, you must be able to explain its details. If you are unable to explain the details of code that you turned in, I consider this a strong indication that you did not write the code on your own; in that case, I have the option of giving you a zero on that assignment, and reporting the incident to the department chair.

Depending on the seriousness of the offense, students caught cheating could be assigned an "F" in the course, or be expelled from school.

Accommodations for Students with Disabilities

Students with disabilities who need accommodations for exams are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) will facilitate the accommodation process for individuals with verified disabilities. If a student is a DPRC client, he/she must present an RAV (Reasonable Accommodation Verification) and an EAR (Exam Accommodation Request) to the instructor at the beginning of the semester. Students are responsible for submitting the completed EAR form to the DPRC. Any changes to the accommodation require prior approval by a DPRC specialist. Changes cannot be requested during an exam. The DPRC is located in the SSB-110 and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu).

Student Disclosures of Sexual Violence

SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to

notify the Dean of Students. To disclose any such violence confidentially, contact:
The SAFE Place - (415) 338-2208; http://www.sfsu.edu/~safe_plc/
Counseling and Psychological Services Center - (415) 338-2208; http://psyservs.sfsu.edu/

Course Schedule

Date	Topic	Assignment	Reading
08/23/2017	Syllabus		Syllabus
08/28/2017	Introduction		1.1-1.4
08/30/2017	OS Structure	Prerequisite Quiz	2.1-2.2
09/04/2017	No Class – Labor Day		
09/06/2017	OS Structure	Coding Assignment 1	2.3-2.4
09/11/2017	Process		3.1-3.2
09/13/2017	Process	Coding Assignment 2	3.3
09/18/2017	Inter-Process Communication		3.4
09/20/2017	Threads		4.1-4.2
09/25/2017	Threads	Coding Assignment 3	4.4
09/27/2017	Process Synchronization		5.1-5.3
10/02/2017	Process Synchronization		5.5-5.6
10/04/2017	Process Synchronization	Homework 1	5.7
10/09/2017	Process Synchronization		
10/11/2017	CPU Scheduling	Coding Assignment 4	6.1-6.2
10/16/2017	CPU Scheduling		6.3
10/18/2017	CPU Scheduling		6.5-6.6
10/23/2017	Main Memory	Coding Assignment 5	7.1-7.3
10/25/2017	Main Memory		7.4-7.5
10/30/2017	Main Memory		7.6
11/01/2017	Virtual Memory		8.1-8.2
11/06/2017	Virtual Memory		8.4
11/08/2017	Virtual Memory	Homework 2	8.5-8.6
11/13/2017	Mass-Storage Structure		9.1-9.2
11/15/2017	Mass-Storage Structure		9.4-9.5
11/20/2017	No Class – Thanksgiving		
11/22/2017	No Class – Thanksgiving		
11/27/2017	File-System Interface	Coding Assignment 6	10.1-10.2
11/29/2017	File-System Interface		10.3-10.4
12/04/2017	File-System Implementation		11.1-11.4
12/06/2017	Review/Wrap up		
12/11/2017	Q&A		
12/13/2017	Final Exam (1:30PM-4:00PM)		

*Note that this is the preliminary schedule, which may be altered as the term progresses.