





CSIS 614: Advanced Operating Systems

Spring 2020

Course Information

	Instructor: Dr. Jonathan Z. Sun		Office: Harbor Walk East 313
	Phone: (843) 953-8151		Email: sunjz@cofc.edu
Office Hours: by appointment			

Meeting Days. The class meets in classroom on Mondays, Feb. 17, Mar. 23, Apr. 20, and online in other weeks.

Meeting Time & Place. 5:30pm – 8:15pm, Harbor Walk East 300

Online Study. Lectures and materials will be posted at <http://sunjz.people.cofc.edu>

Required Textbook. *Operating Systems Concepts 9th or 10th Edition.*, by Silberschatz, Galvin and Gagne, John Wiley & Sons

Course Description

This course covers a broad range of advanced operating systems concepts including protection, security, memory management, kernels, file systems, synchronization, naming, networks and distributed systems as well as recent trends in operating systems design. Specific aspects of operating systems that support distributed computing will be emphasized.

Prerequisite(s): CSIS 604 or permission of department.

Learning Modules

This course is partitioned into three learning modules. Module one covers the overall OS concepts and structures, processes and threads, and CPU scheduling. Module two covers synchronization, deadlocks, memory management, and file system. Module three covers storage and IO, protection and security, virtual machine and distributed systems. Each module is assessed by a project and a test.

Learning Outcomes

After completing CSCI 614 students will be able to:

1. Understand modern operating systems structure;
2. Understand process management concepts, and be able to design, implement and evaluate multiprocessing(or multithreading) systems;
3. Understand memory management concepts, and be able to design, implement and evaluate virtual memory organizations;
4. Understand file systems and I/O mechanisms;
5. Understand multiprocessor architectures, and be able to design and evaluate the performance of multiprocessor operating systems;
6. Understand real-time system scheduling mechanism;
7. Understand system protection and security concepts.

Course Work

Three Small Projects	60%
Three Tests	40%

- **Projects**
 - All projects are individual.
 - Each project counts for 20 points, 15 for problem solving & 5 for presentation.
- **Tests**
 - All tests are on paper and pencil, and all are close-book, close-notes.
 - Each test counts for 15 points. However your lowest score will be multiplied by 2/3 to make the total out of 40. For example, if your three test scores are 14, 9, 12, then your total is $14 + 6 + 12 = 32$.
- **Challenge to Grading**
 - Grading can only be challenged for mis-calculation or mis-copy type of errors.
 - No extra work will be offered to compensate a poor score.
 - Minor curve to the overall class or minor grace to a certain student at the borderline of two letter grades is possible. However it cannot be asked for. It's the instructor's sole decision without any obligation.

Final Grade Scale

90 – 100% = A	75 – 79% = C+
85 – 89% = B+	70 – 74% = C
80 – 84% = B	Below 70% = F

Schedule

	Contents	Chapters	Assignments
Week 1, Jan. 08.		Syllabus	
Week 2, Jan. 13 Online	Module One. OS concepts & structures	Ch1~2	Project 1 assigned
Week 3, Jan. 20 Online (short for Martin Luther King's day)	Processes and threads	Ch3~4	
Week 4, Jan. 27 Online (short for traveling)	Processes and threads	Ch3~4	
Week 5, Feb. 03 Online	CPU scheduling	Ch6 in 9 th Ch5 in 10 th	
Week 6, Feb. 10 Online	Module Two. Synchronization	Ch5 in 9 th Ch6~7 in 10 th	
Week 7, Feb. 17 Meeting	Project 1 presentation; Test One		Project 2 assigned
Week 8, Feb. 24 Online	Deadlocks	Ch7 in 9 th Ch8 in 10 th	
Week 9, Mar. 02 Online	Memory management	Ch8~9 in 9 th Ch9~10 in 10 th	
Week 10, Mar.09 Online	File system	Ch11~12 in 9 th Ch13~15 in 10 th	
Week 11, Mar. 16 Spring Break			
Week 12, Mar.23 Meeting	Project 2 presentation; Test Two		Project 3 assigned
Week 13, Mar. 30 Online	Module Three. Storage & IO	Ch10,13 in 9 th Ch11~12 in 10 th	
Week 14, Apr. 06 Online	Protection & Security	Ch14~15 in 9 th Ch16~17 in 10 th	
Week 15, Apr. 13 Online	Virtual & Distributed	Ch16~17 in 9 th Ch18~19 in 10 th	
Week 16, Apr. 20 Meeting	Project 3 presentation; Test Three		

C of C Policies

Disabilities

Any student who feels he or she may need an accommodation based on the impact of a disability should contact me individually to discuss your specific needs. Also, please contact the College of Charleston, Center for disability Services <http://www.cofc.edu/~cds/> for additional help.

Student Honor Code

I expect you to abide by the Honor Code and the Student Handbook: A Guide to Civil and Honorable Conduct. If you have a question about how to interpret the Honor Code, ask before acting! I encourage collaboration, but you must document it. Thus, each student will submit their own homework and, when collaborating, provide a reference to those people and documents consulted.

Attendance

ATTENDANCE IS SUPER STRONGLY ENCOURAGED. Attendance at regular classes is not mandatory, but is a great way to engage the course material and to ask questions. Attendance for tests and the exam is expected (rescheduling for sickness is accommodated). Please do not attend class if you are sick or believe you are becoming ill. It is best to document your absence through an absence report in Undergraduate Academic Services.

Electronic Devices

The use of electronic devices, both stand-alone and network capable, will play an increasingly important roll in teaching and learning at the College of Charleston, including their use in our classrooms. Just be respectful about unnecessary distractions to you and to others seated around you.

How to report an absence

Students should come to 67 George Street (white house next to Stern Center) to discuss absences and fill out the appropriate forms. Or get forms online at: http://www.cofc.edu/studentaffairs/general_info/absence Forms can be faxed to the College at 953-2290.

Students will need documentation for health, personal or emergency situations. Athletic Teams and school-sponsored trips will have documented lists of students participating on our letterhead as early in the semester as we get the information from the organization. We would like all information on scheduled outings to reach us at least two full weeks in advance. We will then turn the information back to the coach or advisor.

Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Incidents where the instructor determines the student's actions are related more to a misunderstanding will be handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student's file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the

student may petition for the X to be expunged. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission— is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor. Students can find the complete Honor Code and all related processes in the Student Handbook at <http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php>