CPSC 3220/ECE3220: Introduction to Operating Systems
Summer 2020 Syllabus

Course Information:

Instructor
Dr. Svetlana V. Drachova ("Dr. D."), **sdracho@clemson.edu**

Office/Hours
Thursdays 2-3pm on Zoom: https://clemson.zoom.us/j/92426742339

Section	CRN	Meeting time/location
CPSC 3220	54260	T 1:15 am – 3:10 pm, on Zoom, link on Canvas
		Th - independent study day
ECE 3220	54261	T 1:15 am – 3:10 pm, on Zoom, link on Canvas
		Th - independent study day

Textbooks, Software, Hardware, and Materials:

Required Textbook

1. Thomas Anderson and Michael Dahlin, Operating Systems: Principles & Practice, 2nd edition, Recursive Books, 2014.
   (ISBN-13: 978-0985-673529).

2. Course Management System: http://www.clemson.edu/canvas/

3. Zoom conference software client: https://zoom.us/download

4. A digital device with both video and audio capabilities to virtually attend lectures.
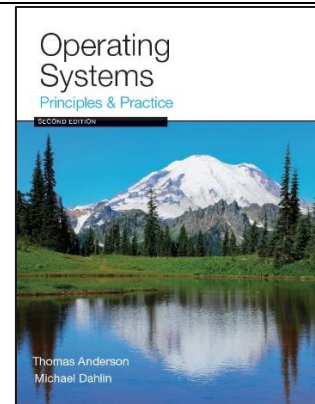
Optional Resources:
Students are encouraged to use additional resources of their choice on Operating systems concepts.

Course Catalog Description
Detailed study of management techniques for the control of computer hardware resources. Topics include interrupt systems, primitive level characteristics of hardware and the management of memory, processor, devices, and data.

Preprequisites
CPSC 2120 and CPSC 2310 with a C or better; or ECE 2230 and ECE 2720 with a C or better.

Key Topics
Topics covered in class include:

- hardware support of operating systems

- synchronization of concurrent threads
- scheduling of threads
- allocation of physical and virtual memory
- storage of data in files

Learning Outcomes

Students who successfully complete this course should be able to:

- Explain the objectives and functions of a modern operating system.
- Contrast kernel and user mode in an operating system.
- Explain the actions of hardware in response to an interrupt.
- Describe the difference between processes and threads.
- Demonstrate the potential run-time problems arising from the concurrent operation of many separate threads.
- Use a synchronization technique to control concurrency among multiple threads.
- List the four necessary conditions for deadlock to occur.
- Compare and contrast the common algorithms used for both preemptive and non-preemptive scheduling of threads.
- Describe the data structures needed to support thread management and thread scheduling.
- Explain the need for dynamic priority adjustments in thread scheduling (e.g., priority aging and priority inheritance).
- Implement a policy for variable-length memory allocation.
- Describe how a virtual memory address is mapped into a physical memory address in a computer system with paged virtual memory.
- Describe how files are stored in secondary storage.
- Explain how an access control list protects files.

Course Website

Cross-listed Canvas course website for CPSC 3220/ECE 3220, accessible from https://www.clemson.edu/canvas will be used throughout the course. Students will submit assignments, and grades will be posted on that site. Course materials such as instructional material, handouts, quizzes, and links will be posted on the course website. Students are responsible for checking the course website daily for new information and announcements.

Course Delivery Mode

The course will be taught in the hybrid mode – on Tuesdays we will meet for lectures and activities via Zoom at the time stated in the syllabus (synchronously), and on Thursday students will do assigned work independently (asynchronously). You will read the assigned chapters, complete exercises/activities, etc. To virtually attend lectures students are required to have a working digital device that has video and audio capabilities (phone, laptop with built-in or peripheral webcam, etc.) Video mode is required during all Tuesday lectures. Students also are required to have a Respondus Lockdown Browser for taking tests/exams.

Course Components

Lectures

Lectures will be held on Zoom on Tuesdays and will cover the chapters of the required textbook and other materials. Textbook readings will be assigned during lecture periods, and students should keep up with these readings throughout the semester. Lectures will not cover all the necessary material, but students will be responsible for covering the rest on their own. Students are expected to take notes and participate regularly.

Quizzes

Throughout the semester, there will be a variable number of announced and unannounced graded quizzes. *You should always expect a pop-up quiz during the lecture!* The total number of points a student can earn on the quizzes by the end of the semester is 80. Missed quizzes cannot be made up, except in cases of a documented illness, or a documented emergency (See **Late Work** policy below).

Homeworks

- Students will be assigned three programming assignments/homeworks (HW 1, 2, 3) during the semester.
- Each homework will be worth 50 points and due before 9pm on the due date.
- Homeworks will be submitted to Canvas, and all programming parts should compile and run on SoC Linux lab machines.
- Programs that do not compile receive no credit.
- Corrupt archives receive no credit.
- Unless otherwise stated, all programming assignments are individual work. You cannot discuss the assignment/solution with anyone except your teacher, or your TA.
- Missed homeworks cannot be made up, except in cases of a documented illness or emergency (See **Late Work** policy below).

Exams

- There are two exams in this course: one in-class midterm, and one final exam. All exams are taken using Respondus lockdown browser.
- Each exam may be different in terms of what materials students are allowed to use. Exam day/time will be announced.
- Midterm is worth 100 points, and final exam is worth 100 points.
- No restroom breaks are allowed during an exam, unless you have obtained a class accommodation from the instructor before that exam begins. Please use the restroom ahead of time.
- Tentative dates for each exam are given in the Course Schedule. Missed exams cannot be made up, except in cases of a documented illness, or an emergency (See **Late Work** policy below).
- Student may be exempt from taking the final examination (at the discretion of the teacher), if they have an A average before the final exam.

Your tentative final exam schedule is on **Friday, July 31st, time TBD.**

Class Activities

There will be a number of class activities during the semester. Activities may include, but not limited to, solving problems, playing games, doing group activities, etc. Student can learn up to 20 points on select class activities during the semester. Not all activities will earn points..

Extra Credit

There is NO individual extra credit in this course. The only extra credit that may be assigned in the course is assigned to the entire class. Extra Credit is optional and does not guarantee that student will pass the course, if that student has a failing average before submitting extra credit work. However, homeworks can include one or two extra credit questions that a student may chose to do.

Late Work

Late work (quizzes, assignments, exams) is **not** accepted in this course, except in the case of a documented illness or a documented emergency. In case of an illness student must provide instructor with the documentation on the official medical clinic/hospital letterhead, stating the exact date that the student became ill, and the date student was released back to class/work. In case of other emergency, documentation should state the exact date of the emergency.

In case of military deployment/exercises, student must obtain a copy of orders from the CO. If student misses class due to a University sanctioned event (conference travel, athletic event, etc.) documentation must be provided as well. All documentation must be provided within 3 days of a missed quiz, exam, lab, or project deadline. Allowing student to make up the missed work will be at the discretion of the course instructor after the documentation has been reviewed.

Technical Issues

Every student is responsible for maintaining their computer equipment in working order and free of malware. Every student also needs to have a contingency plan in case of equipment failure. Always have a plan A, and a plan B! Two is one, and one is none! If a student waits until the last moment to complete their assignment, and experiences technical difficulties, such student will not be granted any extensions.

Grade Calculation

Students must be registered for this course in order to attend class and to receive any grades. Students who are auditing this course may not receive graded feedback. Student grade will be based on the total number of points that the student earned during the semester. Distribution of points is shown below. Approximate weight of the components is also shown below to indicate the portion of each component in the student grade. Grades will only be rounded to the first decimal point.

Components:	Points:	Approx. Weight:
Quizzes	(variable) = 80 points	18%
Assignments	3*50 = 150 points	33%
Exams	2*100 points = 200 points	45%
Class Activities	(variable) = 20 points	4%
Total:	450 points	100%

Final Letter Grades

Final letter grades will be determined according to the following scale:

Undergraduate Grading Scale	
Grade	**Percent**
A	90 – 100%
B	80 – 89%
C	70 – 79%
D	60 – 69%
F	59% or less

Conduct Policy

Students are expected to be courteous and respectful in all interactions with fellow class members, TAs, and the instructor (whether this interaction occurs online, during class, or outside of class). Student misconduct will not be tolerated. Student misconduct includes, but not limited to, arguing with an instructor or TA about course policies, being rude or disrespectful towards a fellow class member or an instructor, sleeping in class, disrupting class, using a computer or other device during class without authorization from the instructor, showing up to class late or leaving class early without permission from the instructor, and refusing to follow course policies or instructions stated by an instructor. The instructor and TAs have the right to assign seats or to ask students to move to another seat if they feel it is necessary, and refusing to sit in an assigned seat will also be considered as an act of student misconduct. NO tobacco products or electronic cigarettes are allowed to be used during class or labs, including cigarettes, cigars, chewing tobacco, dip, etc. For the first case of student misconduct, students may have points deducted from their Quiz grades or their final grade might be lowered by one full letter grade (i.e. an A becomes a B, B becomes a C, etc.) at the instructor's discretion. In extreme cases, or if the misconduct persists, a grade of F will be assigned to the student, and the student will not be allowed to attend class thereafter.

Academic Honesty

"As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a high seminary of learning. Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form."

When, in the opinion of a course instructor, there is evidence that a student has committed an act of academic dishonesty, the instructor must make a formal written charge of academic dishonesty, including a description of the misconduct to Dr. Jeff Appling, Associate Dean of Undergraduate Studies. The reporting instructor may, at his/her discretion, inform each involved student privately of the nature of the alleged charge. In cases of plagiarism (I.B.2.) instructors may use the Plagiarism Resolution Form available from the Office of Undergraduate Studies.

Steps to help prevent academic dishonesty are:

1. Familiarize yourself with the regulations.
2. Refuse to assist students who want to cheat.
3. Protect your work! Do not allow anyone to copy any part of your work, and report anyone

who tries to copy from you to the instructor or TA.

4. Do not copy any code from any unauthorized source. An unauthorized source includes, but not limited to, any webpage, online source, document, book, or person not affiliated with our course.
5. If you have any doubt about what constitutes academic dishonesty, ask your instructor before you turn in an assignment.

Furthermore, selling, posting, or giving away course content such as slides, notes, or any information about exams, quizzes, assignments, projects, or lectures is considered an act of academic dishonesty (unauthorized assistance) unless you have written permission from the instructor. All work submitted for grades should be your own work, and you cannot copy, paraphrase, or modify any work from any source not explicitly permitted by the instructor. The instructor has the right to run programs to detect evidence of unauthorized assistance (usually in the form of copying from another person or unauthorized source) in any assignment submitted by a student in this semester, previous semesters, or future semesters.

Cheating has severe consequences, please do your own work!

Class Accommodation and Accessibility

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to a class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here: http://www.clemson.edu/campus-life/campus-services/sds/.

If You Need Help

Your teacher is here to help you learn the material. To get help you have several options.

1. Talk to your teacher, many times a brief discussion will clarify things enough to get you back on track.
2. Get an additional textbook/materials to help practice programming concepts outside of class.
3. Use search engine to get clarification or another perspective on a difficult concept.
4. Explore tutoring options available from Clemson's Academic Success Center (ASC) at https: //www.clemson.edu/asc/, or Peer & Wise at http://www.clemson.edu/cecas/departments/peer-wise/ index.html
5. Be a self-advocate. It is not always apparent if a student needs help until that students falls far behind. Seek help as soon as you feel you have questions about the material.

Inclement Weather Policy:

If a class is cancelled due to inclement weather, the instructor will make alternative arrangements for submitting work that was due that day. Usually the work will be due the next class, unless specified

otherwise.

Late Instructor Policy
If the instructor is late to class, then students should wait at least 15 minutes and check the course announcements before leaving.

Clemson University Title IX (Sexual Harassment)
Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at http://www.clemson.edu/campus-life/campus-services/access/title-ix/. Ms. Alesia Smith is the Clemson University Title IX Coordinator and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.656.0899 (TDD).

Syllabus Policy
Students are responsible for learning and following all policies stated in this syllabus. This course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. Tentative course schedule will be frequently updated.

See next page for Tentative Schedule

CPSC 3220 and ECE 3220
Summer 2020 Tentative Course Schedule (in progress)

Week	Day	Date	Tentative Topic Outline	Important Dates
1	T	5/12	Welcome, syllabus, OS warm-up	5/13 Last day to add a class or
	Th	5/14	Chapter 1 _ introduction	declare audit
2	T	5/19	Chapter2 – The Kernel Abstraction	5/19 Last day to drop a class or
	Th	5/21		withdraw from the University without a W grade
3	T	5/26	Chapter2, Chapter 3	5/25 Memorial Day holiday
	Th	5/28	finish Chapter 3	
4	T	6/2	Chapter 4	6/2 Last day to apply for August
	Th	6/4	Finish Chapter 4, class activity	Graduation
5	T	6/9	Chapter 5	
	Th	6/11	Chapter 6	
6	T	6/16	Summer Break	6/15 – 6/19 Summer break
	Th	6/18		
7	T	6/23	Midterm Examination	
	Th	6/25	Chapter 7	
8	T	6/30	Chapter 8	6/30 Midterm evaluations posted
	Th	7/2		
9	T	7/7	Chapter 9	7/7 Last day to drop a class or
	Th	7/9	Chapter 10	withdraw from the University without final grades
10	T	7/14	Chapter 11	
	Th	7/16	Chapter 12	
11	T	7/21	Chapter 12 and 13	
	Th	7/23		
12	T	7/28	Chapter 14	7/29 Last Day of classes
				7/30 Study Day
				7/31 Final exams

Syllabus Agreement:

By signing below, I agree that:

I have read and agree to abide by the terms and policies outlined in the syllabus and take full responsibility for my learning and success in this course. This agreement must be filled out correctly and turned in to the instructor during lecture class on the first two weeks of the course; failure to turn in this agreement may result in being withdrawn from the course.

_____

Student Name (Signature)

_____

Student Name (Print)

_____

Date