I have read and understood the policy on academic integrity as outlined in the syllabus for the Fall 2020 Operating Systems course and in the LSU Code of Student Conduct. In particular, I understand that copying or providing to other students, in whole or in part, solutions (text *or* source code) to class assignments from *any* source (including work done by former and current CS students, other humans, animals, zombies, materials downloaded from the Internet, etc.) not directly sanctioned by Prof. Richard is **not acceptable**. I understand that all work must be exclusively my own, with the exception of any team projects, for which I am allowed to collaborate with my assigned partner(s).

THERE IS NO FLEXIBILITY IN THIS POLICY. IF YOU CHEAT, YOU FAIL, AND YOUR ACADEMIC CAREER IS LIKELY TO BE PREMATURELY TERMINATED. THE "REASON" YOU CHEATED IS IMMATERIAL. This policy applies equally to students "transmitting" or "receiving" answers.

Print your name: _____

Sign your name: _____

Date: _____

No grades will be assigned to your work until you sign and hand in this agreement.

LOUISIANA STATE UNIVERSITY
DEPARTMENT OF COMPUTER SCIENCE

CSC 4103: Operating Systems
Fall 2020 Syllabus
Prof. Golden G. Richard III

Me:

Office	☞	Via Zoom only → https://lsu.zoom.us/j/126108881
Email	☞	*golden@cct.lsu.edu*
Office Hours	☞	Monday, Tuesday, Thursday from 10-11:30am or by appointment via https://lsu.zoom.us/j/126108881

You: A student with credit in a course in data structures and significant programming experience. I understand that many students will enter the course without significant experience in C. However, all of the programming assignments are in C, since no operating systems are written in Java and Java has virtually no role in an OS course! This is your chance to learn C if you don't already know it. It's an essential skill and I promise to help!

Meeting: 1:30-2:50p MW via Zoom → https://lsu.zoom.us/j/126108881. **Please**: **Video ON and mute microphone except to speak. If something isn't clear, speak up or use the chat function in Zoom!**

Textbooks: **Operating System Concepts, Tenth Edition**, by Silbershatz et al
Amazon link: https://amzn.to/2KG8Hgr

C in a Nutshell, Second Edition, by Prinz
Amazon link: https://amzn.to/2H0XCWf

You'll also need a copy of the Intel Developer's manuals. These are free and can be downloaded via **http://www.intel.com/products/processor/manuals/.** Additional reading material may be assigned.

Grading:

Midterm Examination	☞	30%
Final Examination	☞	30% (comprehensive)
Written Homework	☞	10%
Programming Assignments	☞	30%

Grading in college courses **has** to be objective—please don't ask me to change grades unless there's an error in grading. On the other hand, if there's a mistake in grading, please talk to me and get it corrected!

A+	**97-100**	**A**	**93-96**	**A-**	**90-92**	**F**	**0-59**
B+	**87-89**	**B**	**83-86**	**B-**	**80-82**		
C+	**77-79**	**C**	**73-76**	**C-**	**70-72**		
D+	**67-69**	**D**	**63-66**	**D-**	**60-62**		

More Details

PROGRAMMING ASSIGNMENTS: There will be three programming assignments, all in C. C is an essential language for systems programming (most operating systems are written almost entirely in C) and if your C is a bit weak, it won't be when you leave this class! You will know the due date for each assignment at least a week in advance and you should consider due dates to be hard deadlines.

NO LATE SUBMISSIONS WILL BE ACCEPTED. TURN IN WHATEVER WORK YOU HAVE BEFORE THE DEADLINE! ANY SOLUTION SUBMITTED AFTER THE DEADLINE WILL RECEIVE A GRADE OF ZERO.

Programming assignments will be submitted via the turnin system on the Linux machine **classes.csc.lsu.edu**. Each assignment will include detailed instructions on what and how to turn in. While you can theoretically work on the assignments on any machine that runs Linux, testing and grading will always be conducted on the classes.csc.lsu.edu server. This means it's **essential** that you test your solutions on this machine, even if you do development elsewhere.

Access to classes.csc.lsu.edu is via **`ssh`** both on- and off-campus. If you're off campus, however, you must use the LSU VPN to hop over LSU's firewall

If you intend to work on assignments off-campus, please read the article and get your environment set up well before the assignments are due.

You've surely heard this before, but my advice is to get started as soon as a programming assignment is handed out. Grades will be assigned based on code quality, documentation, and functionality.

WRITTEN ASSIGNMENTS: There will be several written assignments, aimed at reinforcing concepts we've discussed in class. As with programming assignments, no late submissions are accepted.

TESTS: No calculators, magic rings, laptops, handheld computers, satellite links or other wizardry allowed during the midterm and final. All tests are closed book, closed notes. The final will be comprehensive with an emphasis on material after the midterm. Any missed test will receive a grade of zero unless arrangements are made with me.

CHEATING: All submitted work must be exclusively your own. Cheating is:

- Copying, in whole or in part, the solutions of former students, current students, or any other being, alive or dead. “Copying” includes transmission through email, port knocking, the Web, smoke signals, ESP, steganography, or any other means.
- Obtaining solutions from the Internet or other any archival source.

- Looking at a solution is cheating. If you see something that looks like a solution to a class assignment, avert your eyes and *run away as fast as you can.*

As an LSU student, you are obligated to abide by the LSU Code of Student Conduct, which can be found here: http://students.lsu.edu/saa/students/code. Familiarize yourself with the code of conduct, but put simply, **do your own work**. Of course discussing assignments at a high level for clarification, discussing problems concerning the computing equipment, and studying in groups for examinations is not cheating, but when you submit something, it has to be your own work or the work of your assigned team.

STUDENTS WITH DISABILITIES:

LSU is committed to helping students with disabilities. For more information, please see http://students.lsu.edu/disability and make me aware of any issues so we can resolve them.

CLASS MATERIALS: via MOODLE (*http://moodle3.lsu.edu*)

SLIDES: Lecture slides are available via MOODLE. Please try to view the slides online as much as possible and avoid printing them! The remaining trees will love you.

LEARNING OUTCOMES: Upon completion of this course, students will:

- ✓ Understand why operating systems are important and what functions they serve
- ✓ Have a firm understanding of the evolution of operating systems
- ✓ Understand the major components of modern operating systems
- ✓ Be able to design, implement, test, and evaluate operating systems components

Topics

We'll cover as many of these topics as possible, in roughly this order. Yes, the list of topics sounds dry, but operating systems are much more interesting than they might seem. Please try to read the appropriate chapters in Silbershatz **before** we discuss the topic in class!

- Brief introduction to historical computing and operating systems
- The impact of hardware on operating systems design
- Operating systems components
- Virtualization
- Processes and threads
- CPU scheduling
- Process synchronization (including critical sections, semaphores, monitors, etc.)

- Deadlock (avoidance, prevention, detection, recovery from deadlock)
- Memory management (allocation, logical vs. physical address spaces, swapping, virtual memory, page tables, inverted page tables, frame replacement policies, thrashing, working sets, etc.)
- Management of secondary storage (disk scheduling, swap space management, reliability, stable storage)
- File systems (access, directories, protection, consistency, allocation, performance, robustness)
- Security
- Case Studies