
Syllabus CS 3113

Introduction to Operating Systems (Fall 2022)

Class hours: Tuesday/Thursday 1:30 – 2:45 pm

Location: [Sarkeys Energy Ctr N0202](#)

Final Exam: Tuesday December 13, 1:30 – 3:30 pm

Location: [Sarkeys Energy Ctr N0202](#)

Instructors

Dr. Christan Grant

- **Email:** cgrant@ou.edu
- **Office Hours:** Monday 3:30 pm – 5:00 pm; Thursday 3:00 pm – 4:00 pm (by appointment only)
- **Location:** [Zoom](#)

Teaching Assistants

Jasmine DeHart

- **Email:** dehart.jasmine@ou.edu
- **Office Hours:** Tuesday 3:00 pm – 4:00 pm; Friday 11:00 am – 12:00 pm
- **Location:** [Zoom](#)

Farabee Islam

- **Email:** Farabee.Islam-1@ou.edu
- **Office Hours:** Monday 11:00 am – 12:00 pm; Wednesday 11:00 am – 12:00 pm
- **Location:** [Zoom](#)

Note: Any email messages to the professors or teaching assistants must include **cs3113 in the subject line**. Any email without this string in the subject line will likely be filtered as junk.

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External Tutors

The William Kerber Teaching Scholars will be available for questions and help for several CS topics.

All of their office hours will be held in DEH 115 and on Zoom.

The Zoom ID is 920-7171-4976.

cstutoring is the code word.

Crystal Zhang, Marcos Bernier, Kenin Tran are available at the following times:

Day	DEH 115 Times	Zoom Times
Sunday	12p - 5p	
Mondays	1p - 5p	
Tuesdays	10:30a - 1p	9p - 12p 1p - 4p
Wednesdays	1p - 5p	
Thursdays	10:30a - 1p	9p - 12p 1p - 4p
Fridays	1p - 3p 4p - 7p	
Saturday	12p - 4p	

The above times are subject to change.

Prerequisites

The prerequisites for this course are CS 2413 - Data Structures and CS 2613 - Computer Organization (or ECE 3223). (If you have not taken these courses, you will need instructor permission to take 3113.) You are expected to have a working knowledge of C and C++, including a familiarity with its basic data types and control structures, and an understanding of computer organization. This course will introduce students to operating systems theory and cover the principles of systems programming.

Course Details

Successfully learning operating systems means understanding both theory and system programming. This operating systems course will include activities to support both. As a computer scientist or a computer engineer, this course will be extremely beneficial, but will also be a lot of work. Students should be prepared to spend several hours a week outside of class studying and working on assignments. It is ill-advised to take this course with other programming heavy courses.

Lectures will be a mix of traditional lectures, class discussions, videos and other activities. Participation is required to get the most out of the class.

ABET Student Outcomes

- C: An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- E4: An understanding of security issues and responsibilities.
- I: An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.

Learning Management System

Course website is <https://oudatalab.com/cs3113fa22>. We will use the Canvas learning system. This course website can be reached through canvas.ou.edu. Please check this system regularly to keep informed of all announcements, updates, and changes.

Course Materials

Required Textbooks:

- *Operating Systems: Concepts*, Tenth Edition, John Wiley & Sons, Inc.(ISBN 978-1-118-06333-0)

We will also be using zyBooks this semester.

To access the textbook:

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: OUCS3113GrantFall2022
3. Subscribe

Computer Accounts and Software

Increasingly, software is developed and executed in “the cloud”. This semester the class will make heavy use of a popular cloud infrastructure. Students will be able to deploy virtual machines with various configurations, on the fly. Credentials for using this infrastructure will be distributed after the first week of class. For questions and issues using this software, students should use the in-class discussion board. All students enrolled in class should also have a CS account and access to a Linux-based systems in the CS department. For most computer science students, an account will be automatically created. All code written for this course MUST run using the compilers or interpreters that will be specified for the assignments. It is your responsibility to ensure that your code runs on these systems. For compatibility reasons, we recommend developing and testing on a Linux-based machine.

Course Policies

- Attendance: You are expected to attend all of the class lectures.
- Laptop Computers: It is the responsibility of each student in this class to have a working laptop computer with ample battery (at least 2 hours of life under moderate usage) and wireless Internet connectivity. You must bring the laptop computer to class. If your computer requires repair during the semester, it is your responsibility to make arrangements to have another computer available and to get the necessary software installed. There exist campus resources (including financial help) to repair broken computers; please see the instructors if you would like information about these programs. Note that temporarily borrowing a computer from a fellow student in the class can present a number of problems, including the potential for academic misconduct.
- Newsgroups and Email: The newsgroup on Canvas should be the primary method of communication (outside of class). This allows everyone in the class to

benefit from the answer to your question, and provides students with more timely answers since the TAs and instructors check Canvas at least once a day. Matters of personal interest should be directed to email instead of to the newsgroup, e.g. informing the instructors of an extended personal illness.

- Incompletes: The grade of "I" is intended for the rare circumstance when a student who has been successful in a class has an unexpected event occur shortly before the end of the class. We will not consider giving a student a grade of "I" unless the following three conditions have been met:
 1. It is within two weeks of the end of the semester.
 2. The student has a grade of C or better in the class.
 3. The reason that the student cannot complete the class is properly documented and compelling.
- Religious Holidays: It is the policy of the University to excuse the absences of students that result from religious observances and to provide without penalty for the rescheduling of examinations and additional required classwork that may fall on religious holidays.
- Classroom Conduct: Because cell phones and laptops can distract substantially from the classroom experience, students are asked not to use either during class, except in cases in which they are required as part of a classroom exercise. Disruptions of class will also not be permitted. In the case of disruptive behavior, we may ask that you leave the classroom and may charge you with a violation of the Student Code of Responsibilities and Conduct. Examples of disruptive behavior include:
 - Allowing a cell phone or pager to repeatedly beep audibly.
 - Playing music or computer games during class in such a way that they are visible or audible to other class members.
 - Exhibiting erratic or irrational behavior.
 - Behavior that distracts the class from the subject matter or discussion.
 - Making physical or verbal threats to a faculty member, teaching assistant, or class member.
 - Refusal to comply with faculty or teaching assistant direction.

Covid-19 Considerations

All students are expected to wash their hands, social distance, and wear a mask according to school, state, and federal guidelines. It is my goal to be extremely considerate to personal and family situation, but **please alert me to any problems**

you may be facing as early as possible. Please review the OU covid policies: <https://www.ou.edu/coronavirus>.

Provosts Attendance Statement

A temporary university policy has been established to protect the OU community by ensuring that students who are ill or required to isolate feel encouraged to remain at home. Missing a class session or other class activity due to illness or isolation will not result in a penalty for the absence, and the student will not be asked to provide formal documentation from a healthcare provider to excuse the absence. This policy is based on all students and faculty adhering to the principles of integrity, honesty, and concern for others.

Students who are experiencing symptoms of COVID-19, including cough, fever, shortness of breath, muscle pain, headache, chills, sore throat, loss of taste or smell, congestion or runny nose, nausea or vomiting, or diarrhea or who have been in close contact with others who have symptoms should:

- Remain at home to protect others
- Ensure that any needed screening has been conducted ([COVID-19 Screening and Reporting Tool](#)) and any [needed treatment obtained](#)
- Contact the instructor prior to absence or inability to participate, if possible, and provide an honest report of the reason for which you cannot attend class or complete a course activity
- Continue to complete coursework to the extent possible, using Canvas, zoom, and other online tools
- Submit assignments electronically to the extent possible and as directed by the instructor
- Communicate with the instructor to arrange modifications to deadlines or work requirements or reschedule exams or other important course activities, when it is necessary

Copyright Syllabus Statement for In-Person or Online Courses

Sessions of this course may be recorded or live-streamed. These recordings are the intellectual property of the individual faculty member and may not be shared or reproduced without the explicit, written consent of the faculty member. In addition, privacy rights of others such as students, guest lecturers, and providers of copyrighted material displayed in the recording may be of concern. Students may not share any course recordings with individuals not enrolled in the class or upload them to any other online environment.

Proper Academic Conduct

- Feel free to discuss all assignments with the instructors or the TAs.
- Code (projects and homework): you may **discuss** code solutions with other students. However:
 1. You may not look at or share code with others;
 2. If you discuss a solution with anyone, you must document their names in your assignment;
 3. If you use an external resources (e.g. StackOverflow.com) you must document this in your code.
- Quizzes, Exams, In-Class Exercises: unless otherwise stated, you may not communicate with others about solutions to these assignments.
- Make sure that your computer account is properly protected. Use an appropriate password, and do not give your friends access to your account or your computer system. Do not leave printouts, computers or thumb drives around a laboratory where others might access them.
- Programming projects will be checked by software designed to detect collaboration. This software is extremely effective and has withstood repeated reviews by the campus judicial processes.
- Upon the first documented occurrence of inappropriate collaborative work or of taking a solution from a network resource, the instructors will report the academic misconduct to the Campus Judicial Coordinator. The procedure to be followed is documented in the University of Oklahoma Academic Misconduct Code (<http://integrity.ou.edu>). Both the provider of a solution and the receiver of a solution will be treated equally in the misconduct process.

Integrity Examples

Situation	Integrity Violation?
Students A and B meet and work on their assignment together. Neither student prepared anything in advance and the resulting work is identical.	Yes
Students A and B create drafts of their assignment independently and get together to compare answers and discuss their	No

Situation	Integrity Violation?
understanding of the material. Each person decides independently whether to make changes that are discussed.	
Students A and B agree to prepare drafts of their assignments independently, but only Student A does. Student A shares her draft to Student B who reviews it and offers suggestions for improvement.	Yes
Students A and B agree that student A will work the even problems and Student B will work the odd problems. They share their work.	Yes
Students A and B agree that student A will work on a read function and Student B will work the sorting function. They share their solutions.	Yes
Student A has completed a project and is helping Student B complete the same project. Student A explains to Student B what student B's code actually does, which is different than what Student B thinks the code does. Student B determines how to modify the code independently.	No
Student A has completed a project and is helping Student B complete the same project. Student B is having trouble getting one part of the program to work, so Student A texts Student B three lines of their solution.	Yes
Student A has completed a project and is helping Student B complete the same project. Student B is having difficulty getting the program to work, so student A tells student B exactly what to type for several lines.	Yes
Student A has completed a project and is helping student B complete the same project. Student B is having difficulty getting the program to work, so Student A suggests that Student B use a specific debugging strategy (e.g. "Print out the contents of the variable").	No
Student A has completed a project and is helping Student B complete the same project. Student A shows Student B an example program in the online textbook that will be helpful in figuring out the solution to the problem.	No

Situation	Integrity Violation?
Student A publishes solutions to an assignment on a public Internet page.	Yes
Students A and B work on a project together. After they have finished it, student A takes the code and modifies it so the programs do not appear to be identical.	Yes
Student A copy and pastes code from a public Internet page but changes the variable names.	Yes

[Academic Misconduct Reporting Form](#)

Grading

Points for this class will come from a variety of sources. The different components are weighted as follows:

	Percentage
zyBook Activities	10%
Assignments	25%
Projects	35%
Midterms	20%
Final	10%
	100%

Assignments will be assigned every one to two weeks. Assignments will range from generating custom exam questions, multiple choice quizzes, or coding assignments. Projects will be exclusively coding assignments that will take 2–3 weeks to complete. The class will have between 3–5 projects. Each project will require a README describing the effort.

Submission Format

For written student submissions should only be .txt files, portable document format .pdf, or Markdown .md. Files of type .doc, .docx, or .rtf will not be accepted. Compressed files should be of type .gz or .tar.gz. Files of the .rar format will not

be accepted. Other file types, particularly coding files, may be used in the class. The expected file type will be stated. Often, files packaged under non-Unix/Linux flavored operating systems, such as Windows, have a non-negative number of compatibility issues with our grading systems. **If the graders cannot open files for these reasons, the project will not receive credit.**

Late Policy

Late policies are often at odds with the ability for students to receive feedback. I strongly encourage all students to submit assignments at the posted **due date**; not the date the assignment closes. If assignments are not completed on time, the frequent assignments will mount up and the amount of work that can be due may be insurmountable. The policy is that all assignments must be completed before they are graded. This typically means that students will have 3-7 days to complete the assignment. If as long as a student submit the assignment we will not take off extra points. However, the grading time will not be announced and we will not accept assignments after the deadline.

Midterm and Final Exams

As required by the university, the course will have both a midterm and a comprehensive final exam on the date listed in on the class [schedule](#)

Final Grade Scale

Grade cut-offs will be at or below the traditional 90, 80, 70, etc. cut-offs.

Grade questions

- Projects/homework/in-class assignments: Grading questions for projects should first be brought to the instructor/TA that originally did the grading. If talking to the TA does not resolve your question, please see one of the instructors. All grading questions must be brought to our attention within one week of them being graded.
- Exams: All grading questions must be addressed within one week of the graded exam being returned.

Please note that when an exam/assignment is brought with grading questions, we may examine the entire exam/assignment and your final grade may end up lower.

Canvas Grade Summary

Canvas has a grade book that is used to store the data that are used to calculate your course grade. It is the responsibility of each student in this class to check their grades on Canvas after each assignment is returned. If an error is found, bring the graded document to any of the instructors or TAs, and we will correct Canvas.

Miscellaneous

Specific Outcomes of Instruction

By the end of the semester, the students will increase their:

- Ability to apply knowledge of computing and mathematics appropriate to the discipline.
- Ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
- Ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- Understanding of ethical issues and responsibilities.
- Recognition of the need for and an ability to engage in continuing professional development.
- Ability to use current techniques, skills, and tools necessary for computing practice.
- Ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices.
- Ability to apply design and development principles in the construction of software systems of varying complexity.

Course Evaluations

The College of Engineering utilizes student ratings as one of the bases for evaluating the teaching effectiveness of each of its faculty members. The results of these forms are important data used in the process of awarding tenure, making promotions, and giving salary increases. In addition, the faculty uses these forms to improve their own teaching effectiveness. The original request for the use of these forms came from students, and it is students who eventually benefit most from their use. Please take this task seriously and respond as honestly and precisely as possible, both to the machine-scored items and to the open-ended questions.

Reasonable Accommodation

The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the professor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. This includes your academics, housing, and community events. If you are experiencing a disability, a mental/medical health condition that has a significant impact on one or more life functions, you can receive accommodations to provide equal access. Possible disabilities include, but are not limited to, learning disabilities, AD(H)D, mental health, and chronic health. Additionally, we support students with temporary medical conditions (broken wrist, shoulder surgery, etc.) and pregnancy. The [Office of Disability Services](#) is located in the University Community Center at 730 College Avenue; the phone is 405-325-3852 or TDD only is 405-325-4173. Email at adrc@ou.edu.

Adjustment for Pregnancy/Childbirth-Related Issues

Should you need modifications or adjustments to your course requirements because of documented pregnancy-related or childbirth-related issues, please contact your professor or the Accessibility and Disability Resource Center at 405-325-3852 as soon as possible. Also, see the Institutional Equity Office [FAQ on Pregnant and Parenting Students' Rights](#) for answers to commonly asked questions.

Title IX Resources

Anyone who has been impacted by gender-based violence, including dating violence, domestic violence, stalking, harassment, and sexual assault, deserves access to resources so that they are supported personally and academically. The University of Oklahoma is committed to offering resources to those impacted, including: speaking with someone confidentially about your options, medical attention, counseling, reporting, academic support, and safety plans. If you would like to speak with someone confidentially, please contact [OU Advocates](#) (available 24/7 at 405-615-0013) or another confidential resource (see ["Can I make an anonymous report?"](#)). You may also choose to report gender-based violence and discrimination through other means, including by contacting the [Institutional Equity Office](#) (ieo@ou.edu, 405-325-3546) or police (911). Because the University of Oklahoma is committed to the safety of you and other students, I, as well as other faculty, Graduate Assistants, and Teaching Assistants, are mandatory reporters. This means that we are obligated to report gender-based violence that has been disclosed to us to the Institutional Equity Office. This includes disclosures that occur in: class discussion, writing assignments,

discussion boards, emails and during Student/Office Hours. For more information, please visit the [Institutional Equity Office](#).

Final Exam Preparation Period

Pre-finals week will be defined as the seven calendar days before the first day of finals. Faculty may cover new course material throughout this week. For specific provisions of the policy please refer to OU's [Final Exam Preparation Period policy](#).

Emergency Protocol

During an emergency, there are official university [procedures](#) that will maximize your safety.

Severe Weather

If you receive an OU Alert to seek refuge or hear a tornado siren that signals severe weather:

1. *LOOK* for severe weather refuge location maps located inside most OU buildings near the entrances.
2. *SEEK* refuge inside a building. Do not leave one building to seek shelter in another building that you deem safer. If outside, get into the nearest building.
3. *GO* to the building's severe weather refuge location. If you do not know where that is, go to the lowest level possible and seek refuge in an innermost room. Avoid outside doors and windows.
4. GET IN, GET DOWN, COVER UP.
5. *WAIT* for official notice to resume normal activities.

[Severe Weather Refuge Areas](#)

[Severe Weather Preparedness - Video](#)

Armed Subject/Campus Intruder

If you receive an OU Alert to shelter-in-place due to an active shooter or armed intruder situation or you hear what you perceive to be gunshots:

1. *Avoid*: If you believe you can get out of the area WITHOUT encountering the armed individual, move quickly towards the nearest building exit, move away from the building, and call 911.

2. *Deny*: If you cannot flee, move to an area that can be locked or barricaded, turn off lights, silence devices, spread out, and formulate a plan of attack if the shooter enters the room.
3. *Defend*: As a last resort, fight to defend yourself.

For more information, visit <http://www.ou.edu/emergencypreparedness.html>

Shots Fired on Campus Procedure - Video

Fire Alarm/General Emergency

If you receive an OU Alert that there is danger inside or near the building, or the fire alarm inside the building activates:

1. *LEAVE* the building. Do not use the elevators.
2. *KNOW* at least two building exits.
3. *ASSIST* those that may need help.
4. *PROCEED* to the emergency assembly area.
5. *ONCE* safely outside, *NOTIFY* first responders of anyone that may still be inside building due to mobility issues.
6. *WAIT* for official notice before attempting to re-enter the building.

OU Fire Safety on Campus

Mental Health Support Services


If you are experiencing any mental health issues that are impacting your academic performance, counseling is available at the University Counseling Center (UCC). The Center is located on the second floor of the Goddard Health Center, at 620 Elm Rm. 201, Norman, OK 73019. To schedule an appointment call (405) 325-2911. For more information, please visit [University Counseling Center](#).

Technical Support

For OU IT support, please phone (405) 325-HELP. For help with issues pertaining to any CS department machine (in room DEH 115). Please contact the system administrator John Mueller at jmueller@ou.edu.

Land Acknowledgement

Long before the University of Oklahoma was established, the land on which the University now resides was the traditional home of the "Hasinai" Caddo Nation and

“Kirikir?i:s”  Wichita & Affiliated Tribes. We acknowledge this territory once also served as a hunting ground, trade exchange point, and migration route for the Apache, Comanche, Kiowa and Osage nations. Today, 39 tribal nations dwell in the state of Oklahoma as a result of settler and colonial policies that were designed to assimilate Native people.

The University of Oklahoma recognizes the historical connection our university has with its indigenous community. We acknowledge, honor and respect the diverse Indigenous peoples connected to this land. We fully recognize, support and advocate for the sovereign rights of all of Oklahoma’s 39 tribal nations. This acknowledgement is aligned with our university’s core value of creating a diverse and inclusive community. It is an institutional responsibility to recognize and acknowledge the people, culture and history that make up our entire OU Community.

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Links

Key Class Resources

- [Syllabus](#)
- [Class Schedule](#)

Dates and details in the syllabus and schedule are subject to frequent change, please check regularly. Major changes will be announced on Canvas.

External Resources

Tools

- [GCP instructions](#)
- [Vim Cheat Sheet](#)
- [Vim reference](#)

- [Emacs reference](#)
- [Perf](#)
- [Valgrind](#)
- [Strace](#)
- [Markdown](#)
- [Tmux Cheat Sheet](#)
- [Screen Cheat Sheet](#)
- [Bash for Windows](#): this gives you an Ubuntu-type environment on your Windows machine (including ssh!)

Tutorials

C Language Links

- [C for Java Programmers](#)
- [Reading C expressions](#)

Others

- [Passwordless login](#)
- [Make Manual](#)
- [GNU Coding Standards](#)
- [GDB Tutorial](#)
- [Syscall reference](#)
- [Linux Performance](#)
- [htop explained](#)
- [printf docs](#)

This page is available online at: <https://oudatalab.com/cs3113fa22>

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