Syllabus CS 3113 FA 17

Introduction to Operating Systems

**Class hours:** Tuesday/Thursday 1:30 - 2:45pm  
**Location:** 0170 Nielsen Hall

**Instructor**

Dr. Christian Grant  
**Email:** cgrant@ou.edu  
**Office Hours:** Tuesday and Thursday 3:15 - 4:15pm  
**Location:** Devon Energy Hall 234

**Teaching Assistant**

Brian Neldon  
**Email:** Brian.D.Neldon-1@ou.edu  
**Office Hours:** TBD

**External Tutor**

The William Kerber Teaching Scholars will be available for questions during the following times below. All office hours will be held in DEH 115.
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<th>Day</th>
<th>Times</th>
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<tr>
<td>Sundays</td>
<td>12:30-4:30</td>
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<td>Mondays</td>
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<td>Tuesdays</td>
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<td>Thursdays</td>
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<td>3:30-7:30</td>
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<td>Fridays</td>
<td>9:00-1:00</td>
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**Note:** Any emailing to the professor or teaching assistant must include [cs3113](mailto:cs3113) in the subject line. Any email without this string in the subject line will likely be filtered as junk.

**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 Description**

Successfully learning operating systems means understanding both theory and system programming. This operating systems course will include activities to support both system programming and operating system theory. 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.

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**

- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.
- An understanding of security issues and responsibilities.
- 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**

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**


I plan to use the 8th edition of the Stallings book even though a ninth edition is now available. Both versions of the book will be fine.

**Computer Accounts and Software**

Increasingly, software is run 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 class should also have a CS account and access to a linux-based on-premise. For most computer science students, an account is automatically created. If not, a you can send an email to the system administrator spice@cs.ou.edu. A CS account and linux access will be used for writing programs and sending and receiving materials electronically. 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 the school systems. For compatibility reasons, I recommend developing and testing on a linux-based machine.
Grading Policy

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<tr>
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<th>Percentage</th>
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<tbody>
<tr>
<td>Participation and Quizzes</td>
<td>25%</td>
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<tr>
<td>Homework and Projects</td>
<td>45%</td>
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<td>Midterm</td>
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<td>Final</td>
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Points for this class will come from a variety of sources. To perform well, active participation in online discussions and in-class activities is required. In-class exercises will be often and possibly unannounced. These exercises may include group discussion or individual problem-solving. The total participation score can be calculated by summing up all earned points and dividing it by the number of possible points. Students can waive up to two in-class activities without penalty.

The homework assignments will be assigned weekly. Homework types include coding assignments, essay questions, online discussions, and other similar questions. Homework will generally be submitted through Canvas. The total homework score can be calculated by summing up all the earned points and dividing it by the number of possible points. The lowest two homework scores will be dropped. Most homework assignments will be due at 11:45 pm CST on the night of class.

For written student submissions should only be files .txt, 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 or .zip 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 amount of compatibility issues with our grading systems. If the graders cannot open files for these reasons, the project will not receive credit.

As required by the university, the course will have both a midterm and comprehensive final exam. The final exam will take place on Monday, December 11, from 1:30–3:30.

Grading Scale: A=[90, Inf), B=[80,90), C=[70,80), D=[60,70), F=[0,60)

Late Policy

Any assignment may be turned in up to 24 hours late for a 10% penalty. After this time window, no late work
will be accepted.

**Final Exam**

The final exam will be comprehensive and take place on **Monday**, December 11\(^{th}\) from 1:30pm to 3:30pm.

**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.

**Reasonable Accommodation**

Any student in this course who has a disability that may prevent him or her from fully demonstrating his or her abilities should contact me personally as soon as possible so that we can discuss accommodations necessary to ensure full participation and facilitate your educational opportunities.

**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 me as soon as possible to discuss. Generally, modifications will be made where medically necessary and similar in scope to accommodations based temporary disability. Please see [http://www.ou.edu/eoee/faqs/pregnancy-faqs.html](http://www.ou.edu/eoee/faqs/pregnancy-faqs.html) for commonly asked questions.

**Title IX Resources**

For any concerns regarding gender-based discrimination, sexual harassment, sexual misconduct, stalking, or
intimate partner violence, the University offers a variety of resources, including advocates on-call 24.7, counseling services, mutual no contact orders, scheduling adjustments and disciplinary sanctions against the perpetrator. Please contact the Sexual Misconduct Office 405-325-2215 (8-5) or the Sexual Assault Response Team 405-615-0013 (24.7) to learn more or to report an incident.

**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 at spice@cs.ou.edu.

**Calendar**

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<th>Week</th>
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<th>Topic</th>
<th>Book Chapters</th>
<th>Notes</th>
<th>Due</th>
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<td>Aug</td>
<td>22</td>
<td>Course Review</td>
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<td>Syllabus Discussion; History of Linux</td>
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<td>Review of Computer Organization</td>
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<td>Account Sign-up</td>
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<td>2</td>
<td>Sept</td>
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<td>Introduction to GCP; Introduction</td>
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<td>Introduction to VIM, C, GCC, GDB</td>
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** Dates and details in the syllabus are subject to frequent change.

## Links

### Tools

- [Password Less login](#)
- [GCP instructions](#)
- [Vim Cheat Sheet](#)
- [Vim reference](#)
- [Emacs reference](#)
- [Perf](#)
- [Valgrind](#)
- [Strace](#)
- [Markdown](#)

### Tutorials

- [Reading C expressions](#)
- [GNU C Reference Manual](#)
- [Make Manual](#)
- [GNU Coding Standards](#)
- [GDB Tutorial](#)
- [Linux System Call Reference](#)
- [Linux Performance](#)