

CS 452: Operating Systems

Instructor

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Meetings

Lectures: TuTh 3:00–4:15 CCP-240
Office hours: TuTh 2:00–3:00 CCP-359
by appointment CCP-359

Our Teaching Assistants / Graders are XX:

I am happy to answer questions by email:

<http://cs.boisestate.edu/~buff/files/EmailQuestions.pdf>
[pub/doc/EmailQuestions.pdf](http://cs.boisestate.edu/~buff/pub/doc/EmailQuestions.pdf)

Catalog Description

Operating systems structure and design. Process management, concurrency and synchronization, interprocess communication, scheduling, device management, memory management, file systems and security. Case studies of multiple operating systems.

PREREQ: CS230, CS253, CS321, ECE330, and CS-HU250.

Goals

Students are introduced to basic concepts of operating systems, including:

- using processes and threads
- operating system organization
- computer organization
- device management
- implementing processes and threads
- scheduling
- synchronization
- interprocess communication
- deadlock
- memory management
- virtual memory
- file management
- security
- networks

Textbook and Other Resources

The textbook is:

- *Operating Systems: Three Easy Pieces*, by A. Arpaci-Dusseau and R. Arpaci-Dusseau. 2018. <https://pages.cs.wisc.edu/~remzi/OSTEP>

Other Course Material

This syllabus, lecture slides, assignments, and other material is available in what we'll call our “pub” directory, on our Computer Science Lab (CCP-240, CCP-241, and CCP-242) computers, served by `onyx.boisestate.edu`. The directory is at:

`~jbuffenb/classes/452/pub`

This directory is read-only. So, you might want to copy it, perhaps to your local computer. Since **onyx** services Secure Shell (SSH) requests, you can use SSH clients (e.g., **scp** and **sftp**) to do so. However, beware: It contains symbolic links to parent directories, and **scp -r** will unconditionally follow them, thereby looping forever. To avoid this, use **sftp** or **tar/ssh**, as needed.

On our Canvas website, a copy of this directory can be accessed via the “Files” tab on the left sidebar. This copy is updated less frequently, since bulk upload is slow. Furthermore, although lecture slides can be viewed, the Canvas PDF viewer will not follow links to other files.

Office hours for our Teaching Assistants are at:

```
onyx:~jbuffenb/classes/452/pub/TutorOfficeHours
```

You may also find the following local guide useful:

```
onyx:~jbuffenb/classes/452/pub/etc/cs-linux.pdf
```

In particular, it explains how to use SSH.

Grading

At the end of the course, a letter grade is assigned to each student according to rank among classmates, which is determined from numerical scores assigned for performance of these activities:

<i>Activity</i>	<i>Weight</i>
Homework	80%
Exam	10%
Final	10%

Homework is due at 11:59PM, Mountain Time, on the day it is due. Late work is not accepted. To submit your solution to an assignment, login to a lab computer, change to the directory containing the files you want to submit, and execute:

```
submit jbuffenb class assignment
```

For example:

```
submit jbuffenb cs101 hw1
```

The `submit` program has a nice `man` page.

When you submit a program, include: the source code, sample input data, and its corresponding results.

Scores are posted near my office, as they become available. You are encouraged to check your scores to ensure they are recorded properly. If you feel that a grading mistake has been made, contact me within two weeks of the date that work is returned.

Homework

Several homework problems are assigned during the semester. Each asks you to develop software of stunning elegance and beauty. Let's call it Handsomeware:

1. Queue<Anon>
2. Whack-a-Mole
and
Race Conditions
3. Execution Integrity
4. Driversity
5. Memory Hole

Exam and Final

An exam and a final are administered. These are in-class, open-note, and open-textbook (but no other books) tests. Of course, students work on these individually.

Source-Code Documentation

Good documentation and programming style is very important. Your programs must demonstrate these qualities for full credit. Good documentation and programming style includes:

- heading comments giving: author, date, class, and description
- function/procedure comments giving description of: purpose, parameters, and return value

- other comments where clarification of source code is needed
- proper and consistent indentation
- proper structure and modularity

For more information, and examples, see:

`www.cs.swarthmore.edu/~newhall/unixhelp/c_codestyle.html`

Academic Integrity

The University's goal is to foster an intellectual atmosphere that produces educated, literate people. Because cheating and plagiarism are at odds with that goal, those actions shall not be tolerated in any form. Academic dishonesty includes assisting a student to cheat, plagiarize, or commit any act of academic dishonesty. Plagiarism occurs when a person tries to represent another person's work as his or her own or borrows directly from another person's work without proper documentation.

If a student engages in academic dishonesty, the student may be dismissed from the class and may receive a failing grade. Other penalties may include suspension or expulsion from the University.

Much more information about academic integrity, including examples of academic dishonesty, is at:

`http://cs.boisestate.edu/~buff/files/www-integrity.pdf`

If you are unsure about a particular behavior, ask your instructor.

Labs and Safety

Each student receives an account on the cluster of computers in the Computer Science Labs: CCP-240, CCP-241, and CCP-242. The cluster comprises a server named `onyx.boisestate.edu` and a set of nodes with shared home directories. It is remotely accessible, via SSH. The cluster runs the Linux and Windows operating systems, via VMware.

Physical access requires building and room access. After-hours building access, and all-hours room access, require an authenticated proximity-type student-identification card.

You are responsible for understanding and obeying lab rules:

<https://www.boisestate.edu/coen-its/labs/lab-rules/>

DRAFT

Schedule

<i>Week</i>	<i>Date</i>	<i>Topic</i>	<i>Assigned</i>	<i>Due</i>	<i>Reading</i>
1	Aug 23 Tue				
	Aug 25 Thu				
2	Aug 30 Tue				
	Sep 01 Thu				
3	Sep 06 Tue				
	Sep 08 Thu				
4	Sep 13 Tue				
	Sep 15 Thu				
5	Sep 20 Tue				
	Sep 22 Thu				
6	Sep 27 Tue				
	Sep 29 Thu				
7	Oct 04 Tue				
	Oct 06 Thu				
8	Oct 11 Tue				
	Oct 13 Thu				
9	Oct 18 Tue				
	Oct 20 Thu				
10	Oct 25 Tue				
	Oct 27 Thu				
11	Nov 01 Tue				
	Nov 03 Thu				
12	Nov 08 Tue				
	Nov 10 Thu				
13	Nov 15 Tue				
	Nov 17 Thu				
14	Nov 22 Tue	Thanksgiving			
	Nov 24 Thu	Thanksgiving			
15	Nov 29 Tue				
	Dec 01 Thu				
16	Dec 06 Tue				
	Dec 08 Thu				
17	Dec 13 Tue				
	Dec 15 Thu	Final: 12:00-2:00			