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Spring 2021

CS333: Introduction to Operating Systems

Winter Term Remote Instruction

We continue to operating in unusual circumstances. The current COVID-19 pandemic is affecting all of us in various ways, both big and small. [PSU is working to keep the community informed](), and you are not alone. I continue to adjust our course plans to accommodate remote teaching and may have to make additional changes as the term progresses and we learn what is working and what is not working for our course community. Please reach out if you have questions or concerns.

Be Kind. Be Polite: This is a difficult time for all of us and remote learning is very new for this course and possibly for you as well. People will adapt at different rates. Be kind to others who may be having difficulty with something you have already mastered. It is called *pay it forward* and is a very good approach.

Class Recordings: Each class meeting will be recorded and made available to students. The guidance for faculty regarding class recordings is available from [OAI]().

Video Archive: The video archive is located on a [Google Share](). You will be required to use your PSU SSO credentials for access.

Cameras: Unless you feel it necessary, please mute your video. This saves on network bandwidth. Also, if you unmute your video, then your video will be included in the recording of the class meeting.

Mute Your Microphone: You'd be amazed at the sounds that modern microphones can pick up. Please be considerate.

Raise Your Hand: Zoom has a "raise your hand" feature. Please use this when asking questions.

Use Google Calendar: You can use Google calendar to search for calendars for others at PSU. You should be able to search for my calendar and see the entries for our class. The class times are set up as zoom meetings. You should be able to one-click to enter. Office hours will also be on zoom. More info on the class slack channel once the term starts.

Weekend Labs: Weekend drop-in labs in FAB 88-09 will not occur this term. Instead, we are implementing virtual drop-in labs during the same time periods. The drop-in labs are each Saturday and also the Sunday that the assignment is due. Lab hours are 1:00 - 5:00 on zoom. There will be a zoom link on Mark's calendar. Note that the labs are optional and drop-in, which means that you do not have to attend and only drop in if you have

specific issues. The TCSSs may refer you to me and the TAs for certain issues.

Terminal Windows: Course staff recommends [tmux](#) to create a single window that can be shared easily over zoom. This is useful for when you need help from TAs or TCSSs. See the man page on babbage.cs.pdx.edu for details of running tmux.

PSU's [Student guide](#) to learning remotely.

PSU's [Remote Learning Kit](#).

If you know of any additional resources that would be helpful for your fellow students in the class, please let me know and I will put them up here for all.

This course will introduce the core concepts of operating systems, such as processes and threads, scheduling, synchronization, memory management, file systems, and similar. The course will consist of assigned reading, weekly lectures, periodic in-class quizzes, and a sequence of programming projects. The goal of the readings and lectures is to introduce the core concepts. The goal of the projects is to give students some exposure to operating system code. Students are expected to read the assigned materials prior to each class and to participate during in-class discussions.

Course Staff

Mark Morrissey, markem AT pdx.edu, office hours: Tu/Th 12:30 - 1:30, see zoom link on Mark's calender.

Victor Heredia, victor32 AT pdx.edu, office hours: M 4-5 and F 10-11, see zoom link on Victor's calendar.

Students can request appointments with the above course staff outside of office hours via email. Send to all three if you have no preference. Include your availability, days and times, to facilitate the process.

Late Admission to the Course

No late admissions will be allowed after the second class meeting of the term.

Students wishing to enter the class from off the wait list must attend the first two class meetings of the term, entering the zoom meeting with their PSU logon credentials, which will be noted for attendance. No students will be admitted after the first class of the term if they are not attending class.

Mandatory Attendance

Students are required to attend all class meetings. Roll will be taken at the beginning of the class period. Students who are late to class may be marked absent. Students may miss two class meetings without penalty. After that, each missed class will result in one point being deducted from their final average in the class.

Students who do not attend class the **first week** of the term may be ***dropped from the class***.

Prerequisites

Students are expected to have familiarity with programming and debugging in the C programming language; assembly language programming; CPU organization, instruction sets, and registers; program development in the Unix environment (edit, compile, link, load, execute, makefile, using the shell); the Unix system call interface; and basic data structures.

The CS 201 textbook is an excellent resource. *Computer Systems: A Programmer's Perspective*, 3rd ed., Bryant and O'Hallaron, Prentice Hall, 2015. ISBN-13: 978-0134092669

No Course Text

Required course readings are from the course lecture notes, which are linked from the syllabus. The resources listed here are optional and have been used in the past. The OSTEP text covers most, but not all, of the same material. It is still a good resource if you wish additional explanations.
Operating Systems: Three Easy Pieces
Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau, Arpaci-Dusseau Books.
Errata entries for CS333 are located here.
The OSPP text is a good text for the topics up to scheduling and contain good material on virtual memory and advanced topics such as RCU.
Operating Systems: Principles and Practice, Second Edition
Thomas Anderson and Michael Dahlin
Recursive Books, 2014
ISBN 978-0-9856735-2-9

Our project work will use the xv6 operating system. There is a free PDF of the xv6 book:

xv6: a simple, Unix-like teaching operating system
Russ Cox, Frans Kaashoek, and Robert Morris

Grading

Percentages that exams and projects will contribute to the final grade.

Quiz 1	5%
Quiz 2	10%
Quiz 3	10%
Quiz 4	10%
Quiz 5	15%
Project One	05%
Project Two	10%
Project Three	20%
Project Four	15%

Regrade Requests

Any regrade request must be received by the instructor via email within two weeks of the assignment grade and feedback appearing on D2L. Requests must be specific as to why the score or feedback is incorrect. A response will be provided in email. The email chain will be archived.

Regrade requests for exams require that the student schedule a meeting with the instructor. The instructor and student will review the exam together and assess the exam for possible additional points.

Note: Any request for regrade may result in the reevaluation of the entire work. This reevaluation may result in additional points being awarded, no change in the points awarded, or in additional points being deducted from the work. In rare circumstances, additional student work may need to be reevaluated.

Project Source Code

Students may only use the source code that is released for this specific term. If you have taken the course in a previous term, you cannot use that code base, you must update to the new code base. No exceptions.

Access and Inclusion for Students with Disabilities

Accommodations are collaborative efforts between students, faculty, and the Disability Resource Center. Students with accommodations approved through the DRC are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through the DRC should contact the DRC immediately. The DRC may be reached at 503-725-4150 or visit the DRC web page: http://www.pdx.edu/drc.

PSU values diversity and inclusion; we are committed to fostering mutual respect and full participation for all students. My goal is to create a learning environment that is equitable, useable, inclusive, and welcoming. If any aspects of instruction or course design result in barriers to your inclusion or learning, please notify me. The Disability Resource Center (DRC) provides reasonable accommodations for students who encounter barriers in the learning environment.

If you have, or think you may have, a disability that may affect your work in this class and feel you need accommodations, contact the Disability Resource Center to schedule an appointment and initiate a conversation about reasonable accommodations. The DRC is located in 116 Smith Memorial Student Union, 503-725-4150, drc@pdx.edu, https://www.pdx.edu/drc.

- If you already have accommodations, please contact me to make sure that I have received a faculty notification letter and discuss your accommodations.
- Students who need accommodations for tests and quizzes are expected to schedule their tests to overlap with the time the class is taking the test.
- For information about emergency preparedness, please go to the PSU Fire and Life Safety webpage for information.

Extraordinary Circumstances

If an extraordinary situation (for example severe illness) prevents you from working for a period of time, contact us as soon as possible to discuss your situation and arrange a special schedule. Scheduled work commitments do not constitute an extraordinary circumstance. Makeup exams will not be given except in cases of severe and documented medical or family emergencies. Please note that travel is not considered an emergency. If an

emergency arises and you miss an exam, contact the instructor before the exam to arrange for a special circumstance.

Surviving the Course

This is a challenging class with a large work load. To assist students, CS333 staff have developed a [Survival Guide](#) that you are **_required_** to read and follow, especially for your projects. We have a slack space for this class at [pdx-cs-333-2021-02.slack.com](#).

On Academic Honesty

Students are expected to understand the idea of academic integrity and the ramifications of plagiarism, cheating, etc. Contact student services or your advisor if you are unclear on these concepts. Any work submitted by a student wherein substantial parts of the work are not those of the student or a misrepresentation of one student's work as that of another are examples of academic dishonesty. Academic dishonesty will result in a minimum penalty of the loss of all points for that project or exam. All incidents of academic dishonesty will be reported to the office of the [Dean of Student Life](#) for investigation.

The class projects are based on material from [6.828 Operating System Engineering](#) at MIT.
Class web page design as homage to MIT course.
Materials used with permission.
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