New Beginnings Winter 2019

Operating Systems Foundations

When: Tuesdays and Thursdays
      1000-1150 lecture
      1230-1350 lab

Instructor: Sascha Strand
Please see course webpage http://web.cecs.pdx.edu/~sastrand/ for office hours.

Course Learning Objectives

This course will introduce the core concepts of operating systems, such as processes and threads, scheduling, synchronization, memory management, file systems, input and output device management and security. The course will consist of assigned reading, weekly lectures, a midterm and final exam, and a sequence of programming assignments. The goal of the readings and lectures is to introduce the core concepts. The goal of the programming assignments is to give students some exposure to operating system code. Students are expected to participate in in-class discussions.

Text Book

Operating Systems: Three Easy Pieces, Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau, Arpaci-Dusseau Books, March 2015 (Version 1.00).

Reading the textbook is an essential part of this course. All reading listed in the class schedule is required and expected to be completed before the class date next to which it is listed. The textbook is available in an electronic format for free and in print form at http://pages.cs.wisc.edu/~remzi/OSTEP/.

In addition to the textbook, the following reference material will be used for the project assignments:

The BLITZ System, by Harry Porter, approximately 200 pages available at http://web.cecs.pdx.edu/~harry/Blitz/index.html.

Assignments

The programming assignments for this class are based on the BLITZ system. BLITZ is a collection of software, written by Harry Porter, designed to streamline the process of learning about and experimenting with operating system kernel code. BLITZ includes a complete operating system, assembler, linker, loader, and debugger together with software to emulate an underlying CPU and various devices. The emulated CPU and devices are representative of real-world systems but without some of the low-level complexity that complicates the process of learning about the key

underlying concepts. By using BLITZ, students are able to study in detail the low-level operating system code that interacts with the hardware as well as design, code, and test their own modifications to the operating system.

Discussion Questions

Before each lecture for which there is OSTEP reading assigned, you are required to write or answer two discussion questions from each chapter assigned or four total discussion questions (whichever is fewer). These are due at midnight the evening before the respective lecture. Your questions should be posted in a Piazza folder based on the chapter that prompted your question. These questions can clarify a topic in the chapter or pose a critical thinking problem about the material. You can access our Piazza course page at https://piazza.com/class/jqil6r14uix4x6.

Elective Lab in Functional Programming with Haskell

Following on the themes of last term's lab section, this lab will explore topics in functional programming in the Haskell language, including a comparison of parallelism in Haskell to parallelism like we will see in the imperative language KPL.

The lab is elective. If you choose to take it for credit (see below), you will be expected to attend and participate in every lab session. To receive credit for the lab, you must commit to taking it for credit during the first week of classes and miss no more than two lab sections during the term. Credit for the lab is based entirely on attendance and participation. If you choose not to take the lab for credit, you are still welcome to attend and participate.

Grading

Without Lab:

Midterm Exam	20%
Final Exam	20%
Assignments	40%
Discussion Questions	20%

With Lab:

Midterm Exam	15%
Final Exam	15%
Assignments	30%
Discussion Questions	20%
Lab	20%

All assignments are due before the start of class on the day posted on the class schedule. Everyone has two late days that can be used throughout the term, but otherwise assignments received after the due date will not receive credit. All assignments must be submitted through D2L. If you wish to use a late day, submit your assignment through D2L like normal. You must then let me know that you want it graded and a late day used.

Discussion questions are due at midnight the evening before class is scheduled. Late days cannot be used for discussion questions.