**CPS 510: Advanced Operating Systems**  
**Spring 2015**

**Class Meetings**  
TTh 3:05 - 4:20 in D106 LSRC

**Instructor**  
Jeff Chase  
Office hours: W 2:00 - 3:00 in D306 LSRC, or by appointment, or try a drop-in.

**Teaching Assistant**  
Bing Xie

**CPS 510** is an advanced course in software systems and operating systems. An operating system is software that controls some programmable platform for sharing resources and data. All operating systems must deal with core issues of protection, resource management, program environment and execution, coordination, and reliable state storage and recovery. Traditionally the course emphasizes classical operating systems topics: concurrency, facilities for storage, communication, and protection, kernel services and structure, architecture/OS interaction, distributed systems, and practical application of operating system concepts in real operating systems. We also cover a selection of recent advances and research topics in the broader systems area.

**Preparation.** You should be familiar with undergraduate-level computer architecture and operating systems, and consider yourself a strong student and a good programmer. We will ask you to program in C and perhaps other languages. You should be comfortable with Unix concepts and the Unix command interface: see the CSL tutorials.

**Readings.** We will read about a dozen papers (in whole or in part) and discuss those papers and others in class. In addition, you will select a “classic” paper and write a report (two pages) on its significance. There is no required textbook. The recommended optional text is *Operating Systems: Principles and Practice* (Anderson and Dahlin). You may also find the Arpaci-Dusseau text *Operating Systems in Three Easy Pieces (OSTEP)* to be useful. The slides I use for undergraduate course are available to you, and we may draw upon them as needed for background.

**Base workload.** In addition to the readings, there are two assigned programming labs, one midterm exam, and a final exam. A major element of the course is a semester project on a related topic of your choosing, with a short presentation. The labs may be done individually or in pairs, and the project may be a group effort. Here are the dates for Spring 2015:

- Feb 11 (W)  Threads lab  
- Feb 18 (W)  Project proposal (a few paragraphs)  
- Feb 26 (Th)  Midterm exam  
- Apr 1  (W)  Second lab  
- Apr 14 (T)  Project demo/presentation, reports due  
- Apr 27 (M)  Final exam (2:00 PM - 5:00 PM)

**Late work.** Late work receives a penalty of 5% per day, depending on circumstances. It is much better to do the work and hand it in late than to receive a zero on an assignment.

**Assistance.** We will provide online assistance through Piazza: see the course web. Please post your questions there. Anonymous posting is allowed: please maintain a high standard of civility. The instructor holds regular office hours (posted on the course web) and is available at other times by arrangement. Drop-bys are welcome as time allows. If you are having trouble or just want to talk, please visit!
Attendance and participation. Attendance or lack of attendance in class/recitation is not recorded. However, the class is small enough that I will know each of you, and it is expected that you will attend and participate actively. In particular, you should prepare questions or opinions about the reading, and I may call upon you to speak in class. We may also have occasional short written quizzes during class.

Grading. The semester grade is determined from your exam grades (50%) and lab/project work (50%). I will make adjustments of up to half a letter grade for participation, engagement, and quiz results. Additional information about grading policies, project, and exams is available on the course web.

Topics. A list of topics and related reading is available on the course web.

Policy on collaboration for CPS 510. The Duke Community Standard applies in all aspects of this course: we value your honor and your honesty. Collaboration on lab work and project work is encouraged. Help each other. However, any work you turn in must be your own, and you may be called upon to explain (alone) your choices and approaches in more detail. You may incorporate public software into your assigned lab work and course project to a reasonable extent, but not so much as to undermine the educational purpose and spirit of the project. You must acknowledge any sources of your words, ideas, and software when they are not your own, and you must disclose in advance, without any specific request, any sources you used. Sharing code among students taking the course in the same semester is allowable by mutual consent, however it is strongly discouraged and it will not improve your grade. Do not use code from a student who took the course in a previous semester. All students should understand that we have software that flags copied code with a high degree of certainty and precision. (The tools do not differentiate the makers from the takers.) No assistance of any kind is acceptable during exams.