CS144 Administrative Details

CS144 Staff

September 26, 2013

Summary

CS144 is an introductory course on computer networking, specifically the Internet. It focuses on explaining the principles and practice of computer networking, grounded in how the Internet works. Examples the course covers range from how bits are modulated on wires and in wireless to application-level protocols like BitTorrent and HTTP. Students implement a handful of low-level protocols and services, including reliable transport, IP forwarding, and a Network Address Translation device. Students gain experience reading and understanding RFCs (Internet protocol specifications) as statements of what a system should do. The course explores many of the concepts in current practice and recent developments, such as net neutrality and DNS security.

CS144 is taught using a flipped classroom. Most instructional material is in the form of videos recorded by the instructors, which students are expected to watch outside of class. Class meets three times a week. Attendance at Monday and Wednesday meetings is mandatory, Friday meetings are optional. Monday class meetings are dedicated to in-class exercises and demonstrations, such as exploring the topology of Stanford’s network and examining a secure HTTP certificate chain for different websites. Wednesday class meetings are guest lectures from leading Internet researchers, its original designers, and other speakers who will provide interesting perspectives on the past, present, and future of the Internet. Speakers will include David Clark, the chief protocol architect of the Internet when it was designed, Lt. Gen Bob Elder, who was commander of the 8th Air Force, responsible for Air Force computer network operations, and Greg Peters from Netflix, which is responsible for 30% of U.S. Internet traffic today. Friday class meetings are optional section meetings. The class will be split in half. One half will meet with Professor McKeown and one half will meet with Professor Levis, with the two alternating between weeks so each group meets with each professor five times. Section meetings will be open discussions about interesting topics that touch on society, such as the BitCoin currency, the Tor anonymization network, and the emergence of the Internet as a military tool.

Prerequisites

The formal prerequisite for CS144 is CS110. CS144 is a systems course: a significant portion of your grade is based on programming assignments in C. Most core, low-level systems today (OS kernels, cloud services, databases, networking stacks) are still written in C, for good reasons. If you are not very comfortable with C and familiar with gdb, then you will likely find the programming assignments very difficult. There will be a gdb tutorial early in the quarter as a refresher course, but if you have never used gdb before we cannot stress strongly enough that you should learn how to as soon as possible.

Credits

If you are an undergraduate, you must enroll for 4 credits. Graduate students may enroll for either 3 or 4 credits.
Course Videos and Quizzes

The course videos are organized into units, with each unit corresponding to a week of course time. The video units have integrated quizzes. These quizzes are graded. You have until 2PM (23:00 UTC) on the following Monday to complete a unit. For example, class begins on Monday, September 23rd. You have until 2:00PM on Monday, September 30th to complete the quizzes in Unit 1 for credit.

The motivation for grading video quizzes is that the flipped classroom model makes it very easy for students to fall behind on the material. This results in students trying to learning it in big bursts of many videos, which leads to less being learned. As course exercises, labs, and guest lectures are time to the units, we want everyone to stay up to date. The goal of these quizzes is not to be extremely difficult material that requires a lot of effort, but rather simple thought experiments that lead you to think through the material a bit.

Class Attendance

There are nine Monday exercises and nine guest lectures on Wednesday. You are expected to attend 8 of each: you may miss one Monday exercise and one guest lecture and still receive full credit. If you did not attend the first week of class, this counts as your free miss.

To receive credit for a Monday class, you must hand in the worksheet at the end of class. If you are an SCPD student, you must email a scanned copy of your completed worksheet to your style TA by 9PM PDT on that Tuesday.

Attendance on Wednesdays is handled through a code you enter to a script. There are separate codes for local and SCPD students. Local students do not receive credit if they enter the SCPD code. To receive credit you must enter the code by midnight on Wednesday for local students and midnight on Thursday for SCPD students.

Grading

Your grade in CS144 is based on class attendance, online quizzes in the class videos, written problems (a midterm, a final, two homeworks) and four programming labs.

<table>
<thead>
<tr>
<th>Component</th>
<th>Due Date</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class attendance</td>
<td>Each week</td>
<td>10%</td>
</tr>
<tr>
<td>Online quizzes</td>
<td>Each week</td>
<td>10%</td>
</tr>
<tr>
<td>Homework 1</td>
<td>October 21</td>
<td>5%</td>
</tr>
<tr>
<td>Homework 2</td>
<td>December 2</td>
<td>5%</td>
</tr>
<tr>
<td>Lab 1</td>
<td>October 2, 14</td>
<td>10%</td>
</tr>
<tr>
<td>Lab 2</td>
<td>November 4</td>
<td>10%</td>
</tr>
<tr>
<td>Lab 3</td>
<td>November 11</td>
<td>10%</td>
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<tr>
<td>Lab 4</td>
<td>December 9</td>
<td>10%</td>
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<tr>
<td>Mid-term Exam (90m)</td>
<td>October 28, 7PM</td>
<td>15%</td>
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<tr>
<td>Final Exam (180m)</td>
<td>December 12, 12:15PM</td>
<td>15%</td>
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If you feel you were graded incorrectly on a homework, lab, or exam, please let us know as soon as possible. At the end of the quarter, we take the distribution of numerical grades and decide what ranges correspond to what letter grades. We don’t decide on grade ranges a priori because sometimes exam questions are harder or easier than we thought they would be, and so want to be able to adjust accordingly. However, CS144 is not graded on a curve: we decide on grade ranges, not class population percentages. We do not publish what numerical grade ranges correspond with letter grades. We keep these secret because we’ve found publishing them sometimes leads a few students on the edge to try to scrape up a few points here or there through persistence rather than a mistake in grading, and this reduces our ability to address other student questions.
Late Policy

Programming labs are due on Monday at noon. You may turn in any programming lab in late, until Wednesday at noon. If you turn an assignment in late, its maximum grade is capped at 90%. This does not mean 10% is deducted. A 75% will be a 75%, but a 95% will be a 90%. The idea is that you can turn in something that mostly works and receive full credit for your work, rather than fall behind in class in order to make up for a penalty. Programming labs turned in after this late date receive no credit.

If a real-life event (wedding, funeral, sports matches, hospitalization, etc.) disrupts your ability to turn an assignment in on time, please let us know as early as possible. Clearly, some such events, such as a trip to the emergency room, are less expected than others, and we understand. Emailing the staff 48 hours before an assignment is due asking for an extension because you have a wedding to go to might be met with a frown; emailing us two weeks before the assignment is due and we’ll do our best to accommodate.

Incomplete Policy

Our general policy is to never give incompletes for CS144. If you are falling behind or something life-changing comes up, please contact us immediately and we’ll try to work something out. Generally, taking too heavy a course load is not a great justification: courses last a quarter for a reason. But, for example, a few years years ago H1N1 knocked out a few students for 2 weeks, and we were able to make accomodations and give advice on how to proceed. We don’t allow incompletes because grading programming assignments outside the normal quarter is exceedingly difficult. Furthermore, chances are you’d rather not spend the winter holiday filling in protocol header fields.

Office Hours, Forums, and Email

If you have a question about the class material or a programming assignment, you have three ways to ask: in person (office hours, after class, etc.), the course forum, and email to the staff email address. Here are some guidelines on how you can ask questions to maximize the amount and quality of help we can provide.

Please use the forum for questions about programming assignments and general course questions. Using the forum means that everyone can benefit from the answer; it may be that other students had the same question. Please do ask questions about the requirements of the assignment, the provided code, or the expected behavior of your system. Please don’t ask questions that relate to how to implement a solution. For example, please don’t ask questions that include or ask for source code. If you have any uncertainty about whether a question is OK, please email the course staff. You can find answers to almost any general C question on the web.

If you have questions about your particular solution to an assignment, you should come to office hours. If you are an SCPD student, you can arrange to talk with a staff member over the phone.

Please use email to the staff list for personal questions (e.g., arranging an appointment, questions about grading). Email is better than office hours for questions on grading because it may be the staff member at office hours wasn’t the one who graded your assignment.

Generally speaking, it’s almost impossible to answer programming assignment questions over email. The round-trip-time is too long, and it’s not interactive. Email discussions often boil down to needing a TA to find a bug for you, which isn’t very educational.