

CS 485/ECE 440/CS 585 Computer Networks, Fall 2010

Instructor: Jed Crandall, jedcrandall@gmail.com

Never hesitate to email me directly about anything.

Office and office hours: FEC 335, Tuesdays and Thursday from 9:30am to 11:00am.

Prerequisites: None formally, having taken CS 341 (Computer Organization and Design) before this class is recommended. We won't use any assembly or computer architecture material in this class, but when I discuss systems issues such as context switches or kernel vs. user space I will generally be assuming that all students understand these things as they would coming out of CS 341 and entering CS 481.

TA: Both TAs will attend class regularly, and both are in FEC 126 on the first floor of the Farris Engineering Center, in the little hallway in the middle halfway between the CS office and the other side of the building. Here's their names and office hours:

Shuang Yang: Wednesday 3:00pm to 5:30pm, and Friday 3:00pm to 5:30pm

Dustin Franklin: Friday 8:30am to 11:30am and Friday 1:00pm to 4:00pm

If you can't make it to my office hours or theirs, e-mail me and I'll set up another time to meet with one of us.

Mailing lists: There are two mailing lists, one required and one optional. See the course website for details.

Course website: <http://www.cs.unm.edu/~crandall/netsfall10/>

I'll post lots of important stuff here, like the lab assignments, links to the mailing lists and Google calendar, grades, *etc.*

Required text: *Computer Networks: A Systems Approach* by Peterson and Davie. I'll assume the 4th edition for reading assignments and tests. With this in mind, you can use the 3rd edition (which looks to be similar, but the judgment is yours) at your own risk.

Class meeting time and place: Tue/Thur 8:00am to 9:15am, in Mechanical Engineering 310. Attendance is required, and I will be taking roll all semester.

Grading: The final grade will be calculated as 40% labs, 30% attendance and reading assignments, 15% midterm, and 15% final. The points for each will be added up and divided into the total possible before weighting, so a 5-point reading assignment does not necessarily contribute 5% as much to your grade as a 100 point final. I reserve the right to curve the overall grades at the end of the semester (up, never down) if I don't feel that they reflect the amount of effort students put into the class. The overall grade will be out of 100, weighted as described above. For letter grade purposes, below 60 is an F, 60 and up is a D, 65 and up is a C-, 70 and up is a C, 75 and up is a C+, 80 and up is a B-, 82 and up is a B, 85 and up is a B+, 87 and up is an A-, and 90 and up is an A. I only give A+'s in extreme circumstances.

Note: The grading standards on assignments for undergraduates (ECE 440 and CS 485) and graduates (CS 485) are different, as described below.

Labs: There will be 3 labs, two worth 100 points each and one worth 200 points. C, Perl, and Python are recommended. You may use other scripting languages (*e.g.*, Ruby), but keep in mind that I won't be able to help you as well in languages I don't know as I can in languages I do. Silly fairy tail languages such as LOLCODE or Java are strongly discouraged and will not be supported in the lab environment. Be sure to start early on the lab assignments and get the help you need to get them done.

Late assignments will be accepted only in special circumstances (medical, *etc.*).

Attendance and reading assignments: I will be taking attendance every day of the semester. Your grade for attendance will be the fraction of regularly scheduled lecture periods for which you are present. I may mark you as not present, without immediately notifying you, for any of the following reasons:

- If you don't show up to class that day.
- If you're late.
- If you're using any computer for things not related to this class (e-mail, Facebook, *etc.*).
- If reading was assigned and you don't turn in a reading assignment.

If I assign reading that is to be done before a particular class period, you should turn it in at the beginning of class. It should be a short paragraph (4 or 5 sentences is enough, but feel free to write more if you wish) describing something that the book didn't explain, but is relevant to the reading. You can use Google to answer your own question, or write a paragraph about how you might answer it some other way, but you shouldn't be giving information that's in the chapter. Reading assignments are not graded for points, but you'll be marked as not present if you don't turn in a satisfactory reading assignment on a particular day.

If you copy and paste your reading assignment from somewhere or type it up from the book, it won't count. The text should be your own writing and your own thoughts, ideas, and research. Again, don't summarize what you read, that doesn't count either. Tell me something that's not in the book. Put your name on it. Type it up and print it, I won't accept hand-written reading assignments.

I'll drop up to three "not present" days at the end of the semester. Things like medical emergencies, attending conferences, *etc.*, may be considered excused absences (*i.e.*, not count against your grade) if you contact me about them in a timely manner.

Midterm: The midterm will be on Tuesday, 12 October in class at the regular time. It may be curved, but probably won't be.

Final: The final will be Thursday, 2 December in class at the regular time. It may be curved, but probably won't be. We will not meet during finals week. Attendance is required the last week of classes (7 December and 9 December), but we'll probably do something fun that week.

UNM statement of compliance with ADA: "Qualified students with disabilities needing appropriate academic adjustments should contact the professor as soon as possible to ensure your needs are met in a timely manner. Students must inform the professor of the disability early in the class so appropriate accommodations can be met. Handouts are available in alternative accessible formats upon request."

Cheating and collaboration:

You and your group members are expected to do your own lab setups, collect your own data, and write your own lab writeups. Sharing of source code, configuration files, *etc.*, is encouraged. This is not a programming class, so feel free to grab source code from any place you can find it. Everything you write in the English language, and all ideas that you present as your own in the experimental setup and discussion, however, needs to be original material by you. Each lab assignment will have specific instructions about what is acceptable in terms of cheating and collaboration. Be sure to read it, and if you don't understand it ask me questions.

Each test will state at the top what materials you're allowed to use (book, notes, *etc.*). Not noticing, for example, that the top of the test says that it's not open notes is not an excuse. Anything not specified as open is closed. In other words if the test instructions don't say "open-iPod" you should assume that the test is closed-iPod, and if the test instructions don't say "open-cheat-sheet-on-the-inside-of-your-water-bottle-label", assume that the test is closed-cheat-sheet-on-the-inside-of-your-water-bottle-label.

All university policies regarding these matters will be strictly enforced.

Group assignments and differences between undergraduate and graduate sections:

The grading standards on lab assignments and tests for the graduate (CS 585) and undergraduate (ECE 440 and CS 485) sections are different. In general, 585 will have more emphasis on team leadership, research, and presentation. 485/440 will have more emphasis on implementation. Experimental design and a fundamental understanding of computer networking are critical parts of both 585 and 485.

Each 585 student will be considered a team leader and will be paired with one or two 485/440 “minions.” These will be your teammates for the semester. If you have concerns (*e.g.*, a team member who is not pulling their weight, or a leader who is not dividing the work fairly), let me know as early as possible and I’ll do what I can to remedy the situation. Ultimately, however, you’re each individually responsible for the quality of the work of the group.

The first two labs will be fairly guided, one will be about transport layer protocols and the other about routing. The grading rubric will be printed on the lab assignment, but basically all team members should contribute to the experimental design, the 585 team leader is responsible for guiding the lab work and the 485 minions are responsible for doing the necessary setup and configuration and collecting the data. The 585 team leader is responsible for writing up the results in a lab writeup that includes an abstract, experimental methodology, results, and discussion. All team members should contribute ideas to the experimental methodology and discussion. The 585 team leader is responsible for the presentation quality of the document. Your ability to do technical writing in English will affect your grade if you are registered for 585. I can help you but I can't do the writing for you, so be aware of various resources at your disposal (such as GSA's writing tutors). Undergraduate minions are allowed to help with the writing, but the 585 student is the one who is responsible for doing the writing. Each lab will include a section where you state what each team member did for the setup, collection of results, and writing (in the form of deliverables).

The last lab is open, so you can explore any question related to networking that I sign off on as a good final project. The responsibilities and grading will be similar to the first two labs, but there will also be a presentation that is part of the grade.

Also, the midterm and final will be different for 585 vs. 485/440 students. The 585 midterm and final will be much like the department's comprehensive exams (short, medium, and design questions). The 485 version will test basic knowledge, but may also have an open ended question or two.

Material to be covered:

To some extent we'll follow the book, in the sense that we won't discuss topics not in the book until later when we're doing the final projects. We might skip around a bit since the book is ordered in an OSI model ordering. We'll be trying to ask questions the book doesn't explore and testing the limits of things, plus seeing the protocols the book discusses in action.

We'll start out with basic stuff (the OSI model, physical layer, how Ethernet and IP networks basically work). Then we'll spend a bit of time, along with a lab, exploring transport-layer protocols and related issues, particularly TCP/IP. The second lab will be about routing algorithms and their various tradeoffs. Then each group will explore a more advanced topic as part of the final project.