Course Syllabus
CS 428/528: Computer Networks Syllabus
Spring 2018

Instructor and Teaching Assistant

Instructor: Yan Wang
Office: P12, Engineering Building
Lecture hours: Tuesday & Thursday 6:00 PM – 7:25 PM
Lecture classroom: CW 112
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Teaching assistant: Tianming Zhao
Location: TBD
Timings: TBD

Course Description

The course is designed to let students demonstrate an understanding of the protocols and applications of the Internet. Additionally, to demonstrate a basic understanding of performance analysis for computer networking and illustrate fundamental understanding of networking by programming portions of the entire network stack.

Prerequisites

CS 428/528 assumes students have mastered:

1. C language
2. Basic mathematical concepts such as:
     a. Logarithms and exponents

Course Objectives

In particular, upon successful completion of this course, you will be able to:

- OSI 7-layer model
- Signal encoding, modulation, and multiplexing
- Flow/error control
- Media access control
- Internetworking
- Routing
- TCP/UDP protocols
- Network applications
- Network security
- Multimedia networking

Textbook

- Larry Peterson and Bruce Davie, Computer Networks: A Systems Approach, fifth edition, Morgan Kaufmann Publishers Inc., 2011.

Reference Books and Materials

- SIGCOMM, INFOCOM, ICNP, IMC, etc.
- MOBICOM, SIGMETRICS, etc.
- SOSP, OSDI, USENIX

Main Topics

Introduction to Communication and Networking	Chapter1
Physical Layer	Chapter2
Data Link Layer	Chapter2
Network Layer	Chapter3,4
Transport Layer	Chapter5
Congestion Control and Resource Allocation	Chapter 6
Network Applications	Chapter9
Network Security	Chapter8
Multimedia Networking	Chapter7

Lecture Notes

Lecture Notes for each chapter, in PDF format, will be posted on blackboard before lectures. I recommend that you print lecture notes beforehand and bring them to class so you can notes easily. *Lecture notes do not substitute for class attendance*, since (i) they will not be complete and (ii) significant parts of lectures, including discussions and in-class exercises, may not come from the class notes.

Grading

Your final grade for the course will be based on the following weights for the individual assignments:

20% Project 1, 20% Project 2, 15% Quiz, 20% Midterm, 25% Final Exam

A 10-minute open-book quiz containing two to three questions will be taken at the beginning of each lecture. Each quiz will cover all the material taught in the last lecture. Computer is not allowed; but printouts and books are allowed. There is no make-up for quiz if you miss it.

The midterm will be an in-class, closed-book exam, covering all material up to that point in the course. The final exam will be a closed-book exam, covering material from the whole year, with emphasis on the second half of the course. One-page cheat sheet is allowed in both exams.

Project 1 will focus on the implementation of an IRC-like chat server, focusing first on ensuring familiarity with socket programming. Project 2 will focus on file transfers and the protocol components necessary for efficient and reliable file transfer (retransmission, congestion control, caching, etc.) All projects are to be done in groups of two students. Note that:

NO credit if your project does not compile. Make sure your program compiles on the TA's computer and runs correctly.

Unless under prearranged conditions, late projects will be accepted **up to one day after the deadline** with a penalty of 10% of the project.

Programs must be written in C in Linux.

Be clear and neat in your write-ups. Readability of the programs and solutions is as necessary as correctness. Expect to lose points if you provide a badly written and unclear "correct" solution.

Because of the importance of understanding both the theoretical and hands-on elements of networking, students must pass all three components of the course (homeworks, exams, and the projects) in order to receive a passing grade for the course. This does not affect the actual letter grade assignment unless one of the components is not completed to a passing standard.

Reading Assignments

It is your responsibility to make sure you are familiar with the content in the textbook and other lecture materials. It is recommended that you familiarize yourself with the material by reading it once before it is covered in class. You will then have some context for understanding lectures as much as possible. After the relevant lectures, you could read the book with more attention to detail, filling in gaps in your understanding. Bring remaining questions to class. You may also decide to read the material again before each exam or quiz.

Academic Honesty Expectations

Please review the academic honesty document and make sure that you understand it! The link is at: http://www.binghamton.edu/watson/about/honesty-policy.pdf. Cheating and copying will NOT be tolerated.

- Each programming or theoretical assignment should start with the following statement:

  "I have done this assignment completely on my own. I have not copied it, nor have I given my solution to anyone else. I understand that if I am involved in plagiarism or cheating I will have to sign an official form that I have cheated and that this form will be stored in my official university record. I also understand that I will receive a grade of **0** for the involved assignment for my first offense and that I will receive a grade of **"F" for the course** for any additional offense."

- Each exam and quiz will have a first page with the following statement:

  "I understand that if I am caught copying or talking during the exam/quiz I will have to sign an official form that I have cheated and that this form will be stored in my official university record. I also understand that I will receive a grade of 0 for the involved exam/quiz."

  Your homework assignment or exam will not be graded unless the statement above is followed by your signature.

Collaboration on Assignments

Students are encouraged to help one another and to form study groups. In Computer Science, you can learn more from your peers than from your instructors and teaching assistants. As long as the help is appropriate, please be generous with your time and expertise when helping fellow students. Doing so is good for you and good for them. You are free to discuss assignments *in general terms* with one another. However, please do not show your work directly to other students. Each student must complete your assignments *individually* (unless indicated otherwise by the instructor). Each of you must write your own code, and you must write up all solutions individually. Students submitting solutions (including code) that are determined to be "too similar" are likely to be punished equally and harshly. We can tell whether you have done the work on your own, so please do the work on your own.

Class and Labs Attendance

Attendance is required and attendance will be checked regularly. If you are not present when attendance was checked it will be counted as missing the class. You may miss a total of three classes without a verifiable valid excuse. After that your final grade will be reduced 5% for each missing class. If you miss six or more additional (beyond three) classes you automatically fail the class. Please inform the instructor ahead of time by email for any expected or excused absence. You may *not* "make up" a class by attending the other section; we will take attendance only for our own section.

Computers and Other Electronic Devices

You are not allowed to use your laptop/notebook/tablet computers during class unless explicitly permitted. Cell phones must be turned off or in vibrate alert mode during class.