

CSC458: Computer Networking Systems – Fall'22

Department of Computer Science, University of Toronto

Information Sheet

Date: Sep 2022

Section LEC0101

Class Time: Tue. 1-3 PM

Location: BA1180

Tutorial: Thu. 1-2 PM

Location: LM161

Instructor: Dr. Soheil Abbasloo

E-mail: Abbasloo @ cs

Office: BA5217

Office hours: Tue. 3-5 PM (by appointment only)

Section LEC5101

Class Time: Tue. 6-8 PM

Location: BA1190

Tutorial: Tue. 8-9 PM

Location: BA1190

Class web page:

<http://www.cs.toronto.edu/~abbasloo/teaching/csc458>

Class on Piazza:

<https://piazza.com/utoronto.ca/fall2022/csc458>

Access Code: **csc458#fall22!**

Course Description

This undergraduate level course is centered around the fundamental concepts of networking as embodied on the Internet. The course will cover a wide range of topics including packet switching systems, socket programming, network software/hardware/protocols, network naming and addressing, congestion control, network security, etc. While the class has a textbook, we will not follow its order of presentation but will instead use the text as a reference when covering each individual topic.

Prerequisites

You need to have a basic understanding of probability theory, a strong background in C, a good understanding of Python, and familiarity with the Unix operating system. If you are not sure whether you have the background to take this course, please take a look at the first programming assignment (link available on the class web page) to get an idea of the type of work, and the amount of time you will need to spend on it. If you still are not sure, send me an e-mail.

Teaching Assistants

Please check class web page for information about TAs.

Tentative Outline

#	Date	Topic	Tutorial Session	Assignments
	Sep. 6	-	-	
1	Sep. 13	Overview and Basics Part I	-	
2	Sep. 20	Basics Part II	Socket Programming	
3	Sep. 27	Ethernet & IP	PA1 overview	PA1 out
4	Oct. 4	Routing	Sample Problems	PS1 out
5	Oct. 11	Internet and Inter-net Routing	PS1	PS1 due
6	Oct. 18	Transport Protocol	PA1 Q&A	PA1 due (Oct. 21)
7	Oct. 25	<i>Mid-Term</i>	-	
8	Nov. 1	Congestion Control	-	PA2 out
<i>Fall break – No Class</i>				
9	Nov. 15	Queuing + Middleboxes	PS2	PS2 out
10	Nov. 22	Security	PA2 Review	PS2 out
11	Nov. 29	SDN	Final Review	PA2 due (Dec. 2)
12	Dec. 6	Overlay Networks, Final Review	-	

Note: A “-” means no session.

Bulletin Board and Class Mailing List

Please use the bulletin board (on Piazza) to ask questions from the TAs. You can find a link to the bulletin board on the class web page. By using the bulletin board, everyone in the class can read the replies and the overall number of repeated questions is reduced. Please check the bulletin board before posting any new questions. We guarantee any question posted to the bulletin board will be responded to within 48 hours. There is no guarantee on when you will get a reply to e-mails. We really want you to use the bulletin board. :-)

There is also a class mailing list that will be used by the TAs and the instructor for announcements. *Please never use the class mailing list for questions.* There are many students in this class and we’d all be flooded with e-mails.

If you have any questions that cannot be posted on the bulletin board (e.g. questions about your grades), you can e-mail the TAs directly.

Exams

There will be an in-class midterm exam on October 17th for Section L0101, and October 22nd for Sections L0201, and L5101. There is also a final exam. For the date, and location of the final exam, please check the class web page. All graduate students enrolled in this course are required to complete the midterm and final exams.

Textbook

- “*Computer Networks: A Systems Approach*”, (5th Edition), Peterson, Davie, 2011.

Recommended Books

- “*UNIX Network Programming, Volume I: The Sockets Networking API*”, W. Richard Stevens, Bill Fenner, and Andrew M. Rudoff, 3rd edition, 2003.
- “*TCP/IP Illustrated, Volume 1: The Protocols*”, W. Richard Stevens, 1993.

Notes and Presentations

I will use a combination of slides and a blackboard. Please take notes when I am using the blackboard. The presentations will be available on the class web page (or Quercus), so you don't need to take notes.

Grading

- Assignments: 50%
 - Problem sets: 20%
 - Programming assignments: 30%
- Midterm exam: 20%
- Final exam: 30%

Assignments

There will be two problem sets, both based on the textbook, and the material covered in the class. There will also be two programming assignments. Here is a summary of the requirements for all submitted programming assignments:

- We will use a virtualized network environment (MiniNet) for programming assignments.
- Each student will get access to a virtual machine (on CDF servers) where she/he can complete the programming assignments.
- To ensure compatibility with our marking scripts, please make sure you only use the VM provided through CDF.
- All programs must be written in ANSI "C". To make the grading uniform, we can't accept assignments in C++, Python, Java, Perl,
- Additional information and requirements will be specified in each assignment.

Late Submission Policy

You have *one* free late submission of 24 hours for one of the assignments (problem set, or programming, but not both). You should e-mail the TAs before the deadline to get the free late submission. This 24-hour limit is hard, and cannot be extended. For any late submission other than the free one, 10% of the mark will be deducted for each day late, up to 20%. Assignments will not be accepted after two days.

Academic Offences

"Briefly, an academic offence is a bad thing done to get marks you don't deserve. Slightly more formally, an academic offence is an action by a student or course instructor that breaks the rules about academic credit at the University of Toronto." Cheating is considered a very serious offence. Please avoid it! We are all here to teach and learn after all, and concerns about cheating make an unpleasant environment for everyone.

Permitted Collaboration

The following items are encouraged and allowed at all times for all students in this class:

- Discussion of material covered during lecture, problem sessions, or in handouts
- Discussion of the requirements of an assignment
- Discussion of the use of tools or development environments

- Discussion of general approaches to solving problems
- Discussion of general techniques of coding or debugging
- Discussion between a student and a TA or instructor for the course

Collaboration Requiring Citation

Two students engaging in more detailed discussions must be careful to document their collaboration. Students are required to include the names of those who provide specific assistance to properly credit their contribution, in the same manner as one would cite a reference in a research paper. The expectation is that even with a citation, the author must be able to explain the solution.

Examples of Collaboration That Require Citation

- Discussing the “key” to a problem set or programming assignment. Problem set questions are often designed such that the critical concept takes careful thought and gaining that insight from someone else must therefore be documented.
- Discussing the design of a programming project. Design is a crucial aspect of the programming process and discussion can be valuable. Any design input received from others must be cited.
- Receiving assistance from another student in debugging code. While the TAs are the preferred source for advice, any detailed assistance from someone else must be credited.
- Sharing advice for testing. For example, if someone provides important information on lessons learned (“my program didn't handle the case where the value was 0”) that source must be credited.
- Research from alternative sources. Researching related topics, such as through the Internet, must be documented if the solution submitted is derived from the research information.

Unpermitted Collaboration

All submissions must represent original, independent work. Some examples of activities that do not represent original work include:

- Copying solutions from others. In particular, do not ask anyone to provide a copy of his or her solution or, conversely, give a solution to another student who requests it. Similarly, do not discuss algorithmic strategies to such an extent that you and your collaborator submit exactly the same solution. Use of solutions posted to websites, such as at other universities, is prohibited. Be aware that we photocopy some of the exams prior to handing them back.
- Using work from past classes. The use of another student's solution or the posted class solutions from a previous class constitutes a violation.
- Studying another student's solution. Do not read another solution submission whether in electronic or printed form, even to "check answers."
- Debugging code for someone else. When debugging code it is easy to inadvertently copy code or algorithmic solutions. It is acceptable to describe a problem and ask for advice on a way to track down the bug.