

COMP 535 Computer Networks

Winter 2018

General Information:

Instructor:	Prof. Xue (Steve) Liu
Class Time:	Latest schedule is available on Minerva
Class Location:	Minerva
Office Hour:	Tuesdays 3:30-4:00 PM. Extra office hours can be made through appointments.
Office:	Room 326 McConnell Engineering Building
Email policy:	<p>Emails should be sent from your official McGill email address in order to be responded. Emails not from your official McGill email address will NOT be properly filtered hence will not be responded. Emails SHOULD be started with the title "COMP535: *** ". For every email communication, please make sure to use "COMP535:" as a single starting word (with no spaces) as the start of the title and replace *** with your topic/questions.</p> <p>Please note: Due to the LARGE number of emails (together with all the spams) we receive every day, emails not started with this title may be categorized as spams by the spam filter and will not be responded. We will NOT use WebCT email. Thank you for your understanding.</p>
Prerequisites:	<p>COMP310/ECSE 427 (OS) COMP251 (Algorithms and Data Structures) COMP202 (Introduction to Programming / Foundations of Computing)</p> <p>Please Note: These prerequisites are strict, unless you get special approval from the course instructor. Please bring your transcript(s) and a detailed CV with detailed project and research experiences.</p>
Class Webpage:	MyCourses
TA and hours:	Please see WebCT (as below)
TA office Hour:	Will be posted on WebCT

"McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism, and

other academic offences under the Code of Student Conduct and Disciplinary Procedures (see www.mcgill.ca/integrity for more information).”

We enforce zero tolerance policy for any form of cheating, plagiarism, and other academic offences.

We will report ANY SUSPECTED offenses to the University to handle.

Brief Course Description:

This is a senior undergraduate/first-year graduate course in computer networks. We will examine computer networks within the context of the Internet. It will build on prior knowledge in operating systems, basic algorithms, and programming. We will study the fundamental principles, elements, and protocols of computer networks. We will investigate how the different protocols work, why they work that way, and their performance trade-offs. Using this knowledge, we will try to examine the way applications are deployed on the Internet and their performance trade-offs. In particular, we will try to examine some strategies that are commonly used to accelerate application-level performance in the context of the operation of the Internet.

By the end of the course, you should be able to:

- (i) Explain the operation of a range computer networking applications such as email, web, and peer-to-peer file-sharing;
- (ii) Relate the architecture of the Internet to the underlying design principles;
- (iii) Illustrate the operation of common routing protocols, queuing mechanisms, and congestion control mechanisms;
- (iv) Understand how routers and switches work; and
- (v) Explain the performance of a given set of routing protocols, queuing mechanisms, and congestion control mechanisms on an example network.

Course Syllabus

Note: Subject to change

- Overview & Introduction
- Layered Architecture & Performance
- Direct Link Networks: Encoding , Error Detection, Framing
- Direct Link Networks: Media Access Control
- Direct Link Networks: Reliable Transmission
- Switching and Forwarding
- Learning Bridges
- Routing
- Internet

- Internet/End-to-end Protocols End-to-end Protocols
- Congestion Control
- Fair Queuing
- Application: DNS, HTTP Applications: P2P
- Performance and QoS

Textbook

Required Textbook:

*** Larry Peterson & Bruce Davie, Computer Networks --- a systems approach (5th Edition or later editions)**

Optional: reference textbooks.

1. James F. Kurose , Keith W. Ross, Computer Networking: A Top-Down Approach (latest edition)
2. Andrew S. Tanenbaum, David J. Wetherall, Computer Networks (5th Edition or Latest edition)

Evaluation

Evaluation Components:

Activity	Percentage
Exam 1 (in class, i.e. "in class test)	30%
Exam 2 (in class or separate from class), (inclusive, i.e. "mid-term" but more towards a "final-like" comprehensive exam)	40%
Programming Assignment	30% (10% + 10% + 10%)
Total	100%

Programming Assignments (PA): The document of PA will be released after class begins. There are three Programming Assignments in this class. The three assignments focus on different components/functionalities of a simulated Link State Routing Protocol implementation. The evaluation of the assignment is in the form of code review, evaluation and testing, and demos. TA will ask the students to show different functionalities of the program and will also ask the students to explain the implementation of the codes. Students can finish the task in groups (no more than 2 people per group, 2 is recommended).

Double Grading Policy: This course has a significant portion of the grade allocated for the programming component. You are expected to submit only your work in these assignments. You can receive advice or tips from others (instructor, teaching assistants, or peers), but the final submission should be yours. You are expected to know all the design decisions in the program and explain all aspects of the program handed in as part of the assignment. To test this condition, we will randomly select some students and ask them to explain their programming assignments. The eventual marks for an assignment will be the minimum of the two marks. For example, if 85 is the marks obtained in the first (normal) evaluation of the programming assignment and 50 is the marks obtained in the second evaluation, then effectively you have 50.

Late Assignment Policy: There will be two deadlines for each assignment: proper deadline and cut-off date. After the proper deadline, there will be a penalty of 30% for each day the assignment is late until the end of the 2nd day after, which is the cut-off date. After the cut-off date, the assignment cannot be handed in, hence you receive 0 grade for that assignment. No individual requests for extensions will be granted unless they are for medical reasons. The penalty is calculated by rounding-up of each day.

The deadlines will be set for EDT 23:59pm. Please observe the time and date very carefully. It is your responsibility to make sure that the assignment is properly submitted to the WebCT.

Re-grading Policy: If you find your assignments or exams are not marked according to the marking scheme, you are encouraged to consult me or the TAs. When you resubmit your assignment or exam for regarding, we reserve the right to re-grade the full exam or assignment without restricting the attention to the disputed portion. So your re-graded mark may be lower than the original mark.