

Course Syllabus

CP 372: Computer Networks

Department of Physics and Computer Science
 Fall 2019

I acknowledge that in Kitchener, Waterloo, Cambridge and Brantford we are on the traditional territory of the Neutral, Anishnawbe, and Haudenosaunee peoples.

Instructor Information

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Course Information

An introduction to the fundamental concepts in computer networking. Topics include overview of network architectures, applications, network programming interfaces (e.g., sockets), transport, congestion, routing, and data link protocols, addressing, local area networks, SDN Networks, wireless networks, and network security.

Class Schedule	MWF 11:30 p.m. - 12:20 p.m.
Class Location	Bricker Academic Building BA209
Pre-requisites	CP 213, CP 264 or CP 386
Office Hours	Mondays: 1:30 p.m. - 2:30 p.m.

Course Overview and Approach

This course provides an introduction to the basics of networking. Examples will be drawn primarily from the Internet protocol suite, e.g., TCP, UDP, and IP. The objectives of this course are:

- To understand the underlying principles of computer networking, and the internet, as an example of a computer network in vast usage today.
- To understand how the bits are sent over wires.
- Understanding the engineering of the Internet including goals, constraints, solutions, and experiences.
- To gain the basic skills for building and maintaining Network applications

The students meet the objectives of the course by participating and following through the assigned tasks. The instructor will try to make the class interactive by using iClicker as well as asking questions. Answering the questions will count towards the final grade in the course.

Course Goals and Learning Outcomes

By the end of this course students should be able to:

- Describe how the internet applications are working
- Develop networking applications using sockets
- Understand how the bits are sent over wire, including framing, error correction, packet switching, multi-access (Ethernet), addressing and forwarding (IP), routing, reliable transport, congestion control (TCP), quality of service, naming (DNS), software defined networks (SDN), and security.

Course Tools and Learning Materials

- All the course materials, information, and assignments will be posted on MyLearningSpace: Laurier’s MyLearningSpace [course login page](#).
- **Required textbook:**
 - **Computer Networking: A Top Down Approach, 7th edition, J.F. Kurose & K.W. Ross. Published by Pearson/Addison-Wesley ©2017.**
- **Lecture slides** are provided by the instructor for each week and will be posted on MLS.
- **Discussion group:** A discussion group will be created on MyLearningSpace, so the students can discuss technical questions related to the assignment over there.
- **Laptop:** Select classes will be run as lab. The students are required to bring their laptop to these classes.

Student Evaluation

Assessment	Weighting
Programming Assignments	20%
Homework Exercises	10%
Class activities	10%
Midterm	25%
Final Exam	35%
Total	100%

Course Passing Requirement

In order to pass the course, students should get half of the maximum point in each of the assignments, homework exercises, midterms and final exam.

Final letter grades are assigned by using the standard university grading scheme:

A+	A	A-	B+	B	B-
90-100	85-89	80-84	77-79	73-77	70-72

C+	C	C-	D+	D	D-	F
67-69	63-66	60-62	57-59	53-56	50-52	0-49

Programming Assignments and Homework Exercises:

To learn the concepts taught throughout the course, the students have to do all the programming assignments and problem-solving homework exercises. By doing programming assignments, the students will learn how to develop network applications as well as design and implement network protocols. The homework exercises are mostly theoretical questions related to the topics covered in the course.

- **Submitting assignments and homework exercises:** Each assignment and homework exercise should be prepared and submitted according to the instructions provided by the instructor. The assignments are posted on MLS along with the instructions.
- **Late Assignment Policy:** All the assignments and homework exercises are due on the date and time specified by the instructor. For the entire semester, you have five free "late days (for both assignments and homework exercises). It is strongly advised to save them for emergencies. You may not use more than two for the same assignment or homework. If you do not have any remaining late days, assignments and homeworks are accepted with a 20% of the assignment's or homework's maximum points per day late. No assignment may be submitted more than two days late.
- If you have any question or concern regarding the grading of your assignment or homework you must contact the course instructor **within one week** after the graded assignment is made available to you (not at the end of the term).
- Assignments and homework exercises should be done individually. Refer to university policy on plagiarism mentioned in the rest of this document.

Class activities

- Attendance are not checked in each session. However, you are responsible for all the material covered in class.
- iClicker will be used in class.
- In select-class we will be running Wireshark Labs (a tool to help us understand the networking protocols taught in the course). The instructor randomly asks students to answer questions related to the labs. Answering these questions will count towards the final grade in the course. The materials are available beforehand.

Exams

There are three exams in this course: one final exam and two (in-class) midterm exams.

- In order to pass the course, a student needs to get at least 50% in each exam.

- The exams are closed books.
- The midterm exams are done in class (online exams through mylearningspace).

Tentative Weekly Schedule

Week #	Day	Date	Topic/ Unit of Study	Due dates
Week 0	Fri	Sep. 6	Introduction	
Week 1	Mon	Sep. 9	Introduction Layering	
	Wed	Sep. 11	Internet history	
	Fri	Sep. 13	Application Layer	
Week 2	Mon	Sep. 16	Application Layer	Homework 1
	Wed	Sep. 18	Application Layer	
	Fri	Sep. 20	Application Layer	
Week 3	Mon	Sep. 23	Transport Layer	
	Wed	Sep. 25	Transport Layer	Assignments 1: Socket APIs
	Fri	Sep. 27	Transport Layer	
Week 4	Mon	Sep. 30	Transport Layer	
	Wed	Oct. 2	Network Layer	Homework2
	Fri	Oct. 4	Network Layer	
Week 5	Mon	Oct. 7	Network Layer	
	Wed	Oct. 9	Midterm	
	Fri	Oct. 11	Network Layer	
Week 6 Reading Week	Mon.	Oct. 14	No Class	
	Wed.	Oct. 16		
	Fri.	Oct. 18		
Week 7	Mon.	Oct. 21	Network Layer	Assignment 2: implement a reliable transport protocol
	Wed.	Oct. 23	Network Layer	
	Fri.	Oct. 25	Network Layer	
Week 8	Mon.	Oct. 28		Homework 3
	Wed.	Oct. 30		
	Fri.	Nov. 1	Link Layer	
Week 9	Mon.	Nov. 4	Link Layer	
	Wed.	Nov. 6	Link Layer	Homework4

	Fri.	Nov. 8	Link Layer	
Week 10	Mon.	Nov. 11	Link Layer	
	Wed.	Nov. 13	Midterm	
	Fri.	Nov. 15	Link Layer	Assignment 3: routing / SDN
Week 11	Mon.	Nov. 18	physical Layer	
	Wed.	Nov. 20	Physical Layer	Homework 5
	Fri.	Nov. 22	Physical Layer	
Week 12	Mon.	Nov. 25	Security	
	Wed.	Nov. 27	Security	
	Fri.	Nov. 29	Security	Homework 6
Week 13	Mon.	Dec. 2	Security	
	Wed.	Dec. 4	Final exam review	

University and Course Policies

- 1. Academic Calendars:** Students are encouraged to review the [Academic Calendar](#) for information regarding all important dates, deadlines, and services available on campus.
- 2. Special Needs:** Students with disabilities or special needs are advised to contact Laurier's Accessible Learning Centre for information regarding its services and resources.
- 3. Classroom Use of Electronic Devices:** Cell phones must be turned off /silent mode (buzzer is off) during class time – see [Policy 9.3](#) (Approved by Senate March 8, 2012).
- 4. Final Examinations:** There is no final exam in this course
- 5.** In every email correspondence with the instructor, put the class number **CP 467** and a brief summary of your message in your email subject: e.g., Subject: CS467 A question on HTML
- 6. Plagiarism:** Wilfrid Laurier University uses software that can check for plagiarism. If requested to do so by the instructor, students are required to submit their written work in electronic form and have it checked for plagiarism. (Approved by Senate May 14, 2002) .

Academic Integrity: Laurier is committed to a culture of integrity within and beyond the classroom. This culture values trustworthiness (i.e., honesty, integrity, reliability), fairness, caring, respect, responsibility and citizenship. Together, we have a shared responsibility to uphold this culture in our academic and nonacademic behaviour. The University has a defined policy with respect to academic misconduct. As a Laurier student you are responsible for familiarizing yourself with this policy and the accompanying penalty guidelines, some of which may appear on your transcript if there is a finding of misconduct. The relevant policy can be found at Laurier's [academic integrity](#) website along with resources to educate and support you in upholding a culture of integrity. Ignorance is not a defense.

University Resources:

- Good2Talk is a postsecondary school helpline that provides free, professional and confidential counselling support for students in Ontario. Call 1-866-925-5454 or through 2-1-1. Available 24-7.
- [Waterloo Student Food Bank](#): All students are eligible to use this service to ensure they're eating healthy when overwhelmed, stressed or financially strained. Anonymously request a package online 24-7. All dietary restrictions accommodated.
- [Waterloo Foot Patrol](#): 519.886.FOOT (3668). A volunteer operated safe-walk program, available Fall and Winter daily from 6:30 pm to 3 am. Teams of two are assigned to escort students to and from campus by foot or by van.
- [Waterloo Student Wellness Centre](#): 519-884-0710, x3146. The Centre supports the physical, emotional, and mental health needs of students. Located on the 2nd floor of the Student Services Building, booked and same-day appointments are available Mondays and Wednesdays from 8:30 am to 7:30 pm, and Tuesdays, Thursdays and Fridays from 8:30 am to 4:15 pm. Contact the Centre at x3146, wellness@wlu.ca or @LaurierWellness. After hours crisis support available 24/7. Call 1-844-437-3247 (HERE247).