



THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-3911-050

Course Name: Computer Networks

Instructor Information

Instructor: Philemon Pak

Office: 3C07

E-mail: p.pak@uwinnipeg.ca

Office Hours: Wed: 16:30 - 17:30

Class Meeting Time: Mon: 18:00 – 21:00

Room No: 3D04

Course Web Page: <https://courses.acs.uwinnipeg.ca/3911-050>

Important Dates

First Class: Jan 6, 2020

Midterm Exam: Feb 24, 2020 (in class hours, first half)

Reading Week: Feb 16 - Feb 22, 2020 (no classes)

Final Withdrawal Date w/o academic penalty: Mar 13, 2020

(A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date)

Last Class: Mar 30, 2020

Final Exam: April 20, 2020 18:00 – 21:00

The university will be closed on February 17 (Louis Riel Day) and April 10 (Good Friday).

Course Objectives/Learning Outcomes

This course is an introduction to fundamental concepts in computer networks. It covers the principles, technologies, protocols, and algorithms of computer networks. The layers of the network stack are discussed, with focus on the internet network stack following a top-down approach. Topics of discussion include network technologies, simple and sliding window protocols, routing and routing algorithms, congestion controls, quality of service, security, and network applications

Evaluation Criteria

Assignments: 20%

- There will be 4 assignments worth 5% each.
- May include any or a combination of the following:
 - Theory, analysis, labs or programming exercises,
- Assignments are to be submitted by email in PDF (Portable Document Format) format to a designated email account (will let you know in class).
- When sending the file via email, please name the file with your name, student ID and the assignment number, e.g. John Doe – 12345 – Assignment 1. And the subject line on the email should have the course number and assignment no., i.e. “ACS-3911-050 Assignment X” where “X” is the assignment number.
- Marks will be deducted for not following the file submission format, file naming format, and instruction in the assignment.
- Multiple submissions are not permitted. Students may submit a partially completed assignment and will receive credit for those attempted problems.
- Due at 11:59:59 pm on due day.
- No late assignment will be accepted, and only under special circumstances e.g. medical, death in a family, etc. Circumstances are subject to approval before late assignment will be accepted and with a 20% penalty off for each late day.
- Tools for programming and labs
 - Python v2.7.8
 - Wireshark v2.6.4+

Midterm Exam: 30%

- Closed-book in-class midterm exam.
Note: The midterm exam is carried out on the 1st half of the exam session day. In the 2nd half we have class session as usual.

Final Exam: 50%

- Closed-book final exam.

Final Letter Grade Assignment

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

A+	90+ - 100%	B+	75 - 79%	C	60 - 64%
A	85 - 90%	B	70 - 74%	D	50 - 59%
A-	80 - 84%	C+	65 - 69%	F	below 50%

Test/Exam Requirements

- Photo ID at exam is required.
- You are expected to write the test/exam on its given day.
- No electronic devices (e.g. cell/smart phone, laptop, scientific calculators, translators, etc.) are permitted.
- Midterm and final exams are closed-book.
- Simple calculators can be used though. Simple calculators are subjected to test and can be denied use at mid-term test and final examination times.
- Unless a medical certificate is provided, no accommodation is made for missed exams.

Prerequisite and Restriction Information*

(This information can be found in the UW General calendar)

- Requisite Courses: A grade of at least C in ACS-2909(3) and ACS-2913(3) (or the former ACS-2911(3) and ACS-2912(3)).

*Make sure that you have the necessary prerequisites to take this course. If you have not successfully completed the above listed course(s), it is in your interest to go to student registration office and officially drop the course.

Email Communication Requirements

- Emails from accounts at uwinnipeg.ca are usually not filtered by the UofW email filter. Thereby it is recommended electronic communication used for the course utilize a UofW email account to minimize the risk of filtering.
- The email sent to the instructor must include your full name, your student #, and the COURSE # WITH YOUR COURSE SECTION # (like ACS-3911-050) in the subject line of your email. If your email address already includes your name (like in UW's webmail) then you can skip typing your name there. A respectful manner is also expected in the email communications.

Services for Students

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 204-786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential.

<https://www.uwinnipeg.ca/accessibility-services>.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2019-20 Undergraduate Academic Calendar online at <http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf>

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at <https://www.uwinnipeg.ca/respect>.

Misuse of Computer Facilities, Plagiarism, and Cheating

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

Avoiding Academic Misconduct and Non-academic Misconduct. Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:

<https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>

Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>
- Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>

Misuse of Filesharing Sites. Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves “aiding and abetting” plagiarism. Students who do this can be charged with Academic Misconduct.

Avoiding Copyright Violation. Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy.

Students must also seek prior permission of the instructor /presenter before photographing or recording slides, presentations, lectures, and notes on the board.

Required Text Book(s)/Reading List

Computer Networking: A Top-Down Approach

Kurose J.F. & Ross K.W.

Pearson, 7th Edition, 2017

ISBN-13: 978-0-13-359414-0

ISBN-10: 0-13-359414-9

Course Outline (Tentative)

I. Introduction

- Computer networks: overview of topics, protocol layers.

II. Core Layers

- Application layer: network applications, HTTP, FTP, DNS.
- Transport layer: multiplexing/de-multiplexing, UDP, TCP, congestion control.
- Network layer: routing algorithms, virtual circuit and datagram, IP.
- Link layer: error detection/correction.

III. Selected Network Topics

- Wireless networks: wireless characteristics, CDMA.
- Multimedia networking: applications, streaming, VOIP, real time protocols.
- Security: cryptography, digital signatures, authentication, secure applications.
- Network Management: infrastructure, internet-standard management framework.

Note that all topics listed may not be covered and may be offered in a slightly different time order.

Additional Course Related Information

- When it is necessary to cancel a class due to exceptional circumstances, instructors will make every effort to inform students via uwinnipeg email (and/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms
- Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses (and/or using the preferred form of communication, as designated in this outline) to ensure timely receipt of correspondence from the university and/or their course instructors
- Please let course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.
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 - March 13, 2020 is final VW date for classes that begin in September and ends December 2nd
- Make-up classes scheduled:
 - None
- No classes:
 - February 16 – February 22 – Winter Reading Week – No Classes