THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number - ACS-3911-001
Course Name – Computer Networks

Instructor Information

Instructor: **Prof. Sergio G. Camorlinga**   **Office:** 3D29
E-mail: **s.camorlinga@uwinnipeg.ca**   **Office Hours**: Th: 16:00 - 17:00 p.m.
                                                              or by email appointment

Class Meeting Time: Tu,Th: 14:30 – 15:45 p.m.   **Room No:** 3D04
Course Web Page: https://courses.acs.uwinnipeg.ca/3911-001
Instructor's Home Page: www.acs.uwinnipeg.ca/scamorlinga

Important Dates

First Class: Jan 4th, 2018
Reading Week (No classes)   Feb 18th – 24th, 2018
Midterm Exam: Feb 27th, 2018
Final Withdrawal Date w/o academic penalty: Mar 14th, 2018
(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: April 3rd, 2018
Final Exam: April 19th, 2018 @ 1:30 pm

Course Objectives/Learning Outcomes

This course is an introduction to fundamental concepts in computer networks. It covers the principles, technology, 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 control, quality of service, security, and network applications.

Evaluation Criteria

- Assignments (include lab practice): 10%
    - There will be 4 assignments worth 2.5% each.
        - May include theory, analysis, labs and/or programming exercises.
    - Due at the beginning of class on due dates.
    - No late assignment will be accepted, or under special circumstances accepted with 20% off for each late day.
    - Assignments should be hand in by due date on paper (no handwritten) unless email submission is requested. Handwritten assignments will not be accepted.
    - Multiple submissions are not permitted. Students may submit a partially completed assignment, and will receive credit for those attempted problems.
    - Tools for programming and labs
        - Wireshark v2.4.3+
        - Python from Enthought Canopy v1.7.4+ or similar
        - Java v1.8.0_151+

- PowerPoint paper presentation 2.5%
    - Teams of two students

- Class attendance: 2.5%
    - Criteria for points per class:
        - one class attendance = 1 point
        - no attendance = 0 point
    - 20 points or more gives the 2.5% maximum for this item. Less points are prorated e.g. 12 points achieved = 1.5% (12 / 20 * 2.5%)

- Midterm Exam: 35%
    - Closed-book in-class midterm exam.

- 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%

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.
- 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.

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.

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 786-9771 or accessibilityservices@uwinnipeg.ca to discuss appropriate options. All information about a student's disability or medical condition remains confidential http://www.uwinnipeg.ca/accessibility .

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 2017-18 Undergraduate Academic Calendar.

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 www.uwinnipeg.ca/respect.

Misuse of Computer Facilities, Plagiarism, and Cheating
Academic dishonesty is a very serious offense and will be dealt with in accordance with the University's policies. Be sure that you have read and understood Regulations & Policies #8, in the 2017-2018 UW Undergraduate Academic Calendar available at http://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf.

Additional information is available at University of Winnipeg library video tutorial "Avoiding Plagiarism" https://www.youtube.com/watch?v=UvFdxRU9a8g

Avoiding Academic Misconduct. Uploading essays and other assignments to essay vendor or essay 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 same class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also obtain instructor/presenter permission before photographing or recording slides, presentations, lectures, and notes on the board.

Required Text Book
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

Prerequisite and Restriction Information[*]
(This information can be found in the UW Academic Calendar in the All Course Description document)
- 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)).

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/demultiplexing, 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

1. When it is necessary to cancel a class due to exceptional circumstances, instructors will make every effort to inform you via uwinnipeg email, as well as the departmental assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.

2. Your uwinnipeg email address will normally be used for course related correspondence.

3. Please note that withdrawing before the VW date does not necessarily result in a fee refund.

4. April 5, 2018 is the class make-up date for courses that conflict with Good Friday, March 30.

5. No classes: Feb. 18-24 Winter Mid-term reading week; Friday, March 30 (Good Friday).