THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number - ACS-3911/3-001
Course Name - Computer Networks

1 Instructor Information

Instructor: Alex Brodsky
E-mail: acs3911@acs.uwinnipeg.ca
Class Meeting Time: Monday and Wednesday, 11:30-12:45
Course Group: Email acs3911@acs.uwinnipeg.ca to receive an invite.
Course Homepage: `www.soyuz.acs.uwinnipeg.ca/~abrodsky/3911`

Office: 3D17
Office Hours: TBA
Room No: 4C84

2 Important Dates

1. Reading Week (no classes): February 16–20, 2009
2. Midterm Exam: February 25, 2009
3. Final Exam: April 13, 2009, 13:30–16:30
4. Final Withdrawal Date w/o academic penalty: March 6, 2009
5. Other deadlines: Three assignments due at 5pm on February 4, March 4, and April 1.

3 Course Objectives and Learning Outcomes

This course covers the principles, concepts, and algorithms of computer networks. Students will be familiarized with the concept of the network stack and its layers. The purpose, design, and implementation of key layers of the network stack will be discussed in-depth, including the fundamental ideas and algorithms. Students will implement some of these to acquire and demonstrate sufficient familiarity with the algorithms.

4 Evaluation Criteria

Assignment	1	2	3
Due Date	February 4	March 4	April 1

1. Assignments (30%)
   - **Late assignments not accepted.**
   - Assignments must be submitted both in paper and by email.
   - All assignments are in English.
2. Midterm Exam (20% or 0%)
   - The midterm is optional. If you choose not to write the midterm or do better on the final exam then your midterm will be worth 0% and your final will be worth 70%.
3. Final Exam (50% or 70%)

Note: The instructor reserves the right to adjust a student's evaluation criteria, with the student's consent, if the instructor deems than an adjustment is warranted.

5 Exam Requirements

- Photo ID is required.
- No dictionaries, notes, calculators, talking slide rulers, or other electronic aids allowed.

6 Required Text

Andrew S. Tanenbaum, "Computer Networks 4th Ed.", Prentice Hall, 2003, ISBN 0-13-066102-3. Note: earlier editions of the same book are acceptable. **There will be regular readings assigned from the text for each lecture. It is in your interest to do the readings in preparation for each lecture.**

7 Prerequisite Information

A grade of at least C in both ACS-2913/3 (or the previous ACS-2911/3 and ACS-2912/3), and ACS-2947/3, and ACS-2906/3. Make sure that you have the necessary prerequisites to take this course. If you have not successfully completed the above listed courses, it is in your interest to go to the student registration office and officially drop the course. Otherwise, the registration office will do it on your behalf.

8 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 discipline bylaw. Be sure you have read and understood Chapter VII, Section 7a starting in the 2008/2009 UW General Calendar. To avoid the possibility of plagiarism here are some rules of thumb to follow.

1. Put away pens, pencils, and keyboards when discussing the problem with others.
2. Acknowledge all help that you received on the assignment in an acknowledgments section at the end of your write-up.
3. Look at other code all you want, but do not copy it.
4. If you are unsure about something ask the instructor!

9 Tentative List of Topics to be Covered

1. Introduction to Networks
   - Network Hardware and Software
   - The Network Stack and Reference Models
   - A Brief History of the Internet
2. The Physical Layer
   - Bandwidth and Latency
   - Network Terminology
   - Transmission Media
3. The Data-Link Layer
   - Services, Primitives, and Design Issues
   - Framing, Error, and Flow Control
4. Medium Access Control
   - The Channel Allocation Problem
   - Multiple Access Protocols
   - Ethernet
5. The Network Layer
   - Services, Primitives, and Design Issues
   - Routing and Routing Algorithms
   - The Internet Protocol (IP)
6. The Transport Layer
   - Services, Primitives, and Design Issues
   - Transport Protocol Elements
   - Elementary Protocols
   - Sliding Window Protocols
   - The User Datagram Protocol (UDP)
   - The Transmission Control Protocol (TCP)
7. The Application Layer
   - Sockets
   - The Domain Name Service (DNS)
   - WWW (HTTP)