

Course Outline (Fall Term)

COE768: Computer Networks

Instructor	NAME: Ngok-Wah Ma Office: EPH 406 Phone: 416-979-5000 ext: 7929 E-mail: bma@ryerson.ca Office Hours: 9-11am, Wednesday
Calendar Description	This is an introductory course in computer networks. In particular, it concentrates on the Internet technology. It first introduces the OSI and TCP/IP network architecture models. It then studies the implementation principles and design issues at each layer of these models. Lecture topics include: OSI and TCP/IP models, data-link protocols, local area networks, wide-area networks, Internet structure, TCP/IP protocol suite, and application Layer protocols. Laboratory work focuses on the implementations of various networking applications based on the BSD socket. In addition, students will gain practical experience by building and studying a physical network using switches and routers.
Prerequisites	<i>(COE 538 or ELE 538) and ELE 635</i>
Compulsory Text(s):	1. <i>"Computer Networks", 5th edition, by Tanenbaum and Wetherall, Prentice Hall, 2011. ISBN-13: 978-0-13-212695-3</i>
Reference Text(s)	<i>None</i>
Learning Objectives (Indicators)	At the end of this course, the successful students will be able to: 1. Uses the specialized core engineering knowledge in the field of computer networks to understand and design a various types of communication links and networks. (1d) 2. Uses engineering knowledge to solve real world open-ended engineering problems. (1c) 3. Uses analytical models to predict and control and networking components and processes behaviors. (1b) 4. Generate solutions for complex engineering design problems. (4d) 5. Demonstrates iterative design process in complex engineering projects. (4h) 6. Writes and revises documents using appropriate discipline specific conventions. (7a) 7. Demonstrates confidence in oral communications and explains and interprets results clearly. (7b) NOTE: <i>Numbers in parentheses refer to the graduate attributes required by the Canadian Engineering Accreditation Board (CEAB).</i>
Course Organization	3 hours of lecture per week for 13 weeks, in 1 section 2 hours of lab/tutorial per week for 12 weeks 4 Lab/tutorial sections of maximum 20 students 2 Teaching Assistants, 2 sections per TA
Teaching Assistants	Shuo Yu s1yu@ryerson.ca Parisa Naraei parisa.naraei@ryerson.ca

Course Evaluation	(The following is a Table and you can add/remove rows/columns as needed)	
	Midterm Exam	25 %
	Lab Project	13 %
	Lab Assignments	12 %
	Final Exam	50 %
	TOTAL:	100 %
Examinations	Midterm exam in Week 7, two hours, open book (covers Weeks 1-5). Final exam, during exam period, three hours, open-book (covers Weeks 6-13).	

Course Content

Chap.	Sections	hours	Topic, description
1	1.1-1.6	3	Introduction
3	3.1-3.5	11	Framing, Error Detection Coding, Error-Control Protocol, HDLC, USB.
4	4.3, 4.4, 4.8	8	Local Area Networks (LANs): CSMA/CD, Ethernet Switching, Spanning-Tree Protocol, Wireless LAN.
5	5.1, 5.2, 5.5, 5.6	9	Internetworking, IPv4, IPv6, Routing Algorithm, Subnetting, Supernetting, Network Design.
6	6.1, 6.4, 6.5	2	Connection-Oriented and Connectionless Services, Berkley Sockets.

Laboratory/Tutorials

Week	Title	Room
2	Study of the layer architecture: Traffic analysis using Wireshark.	ENG412
3	Study of Client Server Model: Setting up various server applications.	ENG412
4	Berkeley Socket Programming: Implementing a File-Transfer application based on TCP.	ENG412
5	Implementing a File-Transfer application based on UDP.	ENG412
6-10	Project: Implementing a Chat-Room Application.	ENG412
11-13	Implementing a small internet: Configuring router and switches; Analyzing the routing and MAC tables.	ENG412

Important Notes

1. All of the required course-specific written reports will be assessed not only on their technical/academic merit, but also on the communication skills exhibited through these reports.
2. All assignment and lab/tutorial reports must have the standard cover page which must be signed by the student(s) prior to submission of the work. Submissions without the cover page **will not** be accepted. The cover page can be found on the departmental web site: [Standard Assignment/Lab Cover Page](#)
3. Should a student miss a mid-term test or equivalent (e.g. studio or presentation), with appropriate documentation, a make-up assessment **may** be scheduled. Alternatively, the weight of the missed work is placed on the final exam, or another single assessment. This may not cause that exam or assessment to be worth more than 70% of the student's final grade. If a student misses a scheduled make-up test or exam, the grade may be distributed over other course assessments even if that makes the grade on the final exam worth more than 70% of the final grade in the course. Make-up assessments cover the same material as the original assessment but need not be of an identical format.

4. Students who miss a final exam for a verifiable reason and who cannot be given a make-up exam prior to the submission of final course grades, must be given a grade of INC (as outlined in the *Grading Promotion and Academic Standing Policy*) and a make-up exam (normally within 2 weeks of the beginning of the next semester) that carries the same weight and measures the same knowledge, must be scheduled.
5. Medical or Compassionate documents for the missing of an exam must be submitted within 3 working days of the exam. Students are responsible for notifying the instructor that they will be missing an exam as soon as possible.
6. **If a student is requesting accommodation due to a religious, aboriginal and/or spiritual observance, he or she must submit a Request for Accommodation of Student Religious, Aboriginal, and Spiritual Observance AND an Academic Consideration form within the FIRST TWO WEEKS OF CLASS or, for a final examination, within two weeks of the posting of the examination schedule.** If the required absence occurs within the first two weeks of classes, or the dates are not known well in advance as they are linked to other conditions, these forms should be submitted with as much lead time as possible in advance of the required absence.
Both documents are available at <http://www.ryerson.ca/senate/forms/reobservforminstr.pdf>. Full-time or part-time degree students must submit the forms to their own program department or school.
7. The results of the first test or mid-term exam will be returned to students before the deadline to drop an undergraduate course in good Academic Standing.
8. Students are required to adhere to all relevant University policies including:
 - Undergraduate Grading, Promotion and Academic Standing: <http://www.ryerson.ca/senate/policies/pol46.pdf>
 - Student Code of Academic Conduct: <http://www.ryerson.ca/senate/policies/pol60.pdf>
 - Student Code of Non-Academic Conduct: <http://www.ryerson.ca/senate/policies/pol61.pdf>
 - Undergraduate Academic Consideration and Appeals: <http://www.ryerson.ca/senate/policies/pol134.pdf>
 - Examination Policy: <http://www.ryerson.ca/senate/policies/pol135.pdf>
 - Course Management Policy: <http://www.ryerson.ca/senate/policies/pol145.pdf>
 - Accommodation of Student Religious, Aboriginal and Spiritual Observance: <http://www.ryerson.ca/senate/policies/pol150.pdf>
 - Establishment of Student E-mail Accounts for Official University Communication: <http://www.ryerson.ca/senate/policies/pol157.pdf>
9. Students are required to obtain and maintain a Ryerson e-mail account for timely communications between the instructor and the students.
10. Any changes in the course outline, test dates, marking or evaluation will be discussed in class prior to being implemented.
11. Assignments, projects, reports and other deadline-bound course assessment components handed in past the due date will receive a mark of ZERO. Marking information will be made available at the time when such course assessment components are announced.
12. If you have taken the course previously and are currently looking to get a laboratory exemption, then you must fill out this form: <http://www.ee.ryerson.ca/guides/ECE-LabExemptionForm.pdf>

Approved by: _____
Course Instructor

Date _____

Approved by: _____
Associate Chair or Program Director

Date _____