Computer Networks

Course Information

Code: COSC 4P14
Credit hours: 36 hours
Location: On-line (synchronous)
Period: September 9th – December 8th, 2020
Time: Wednesdays (2:00 pm – 3:30 pm) and Fridays (2:00 pm – 3:30 pm)
Couse web page: in Sakai
TAs: TBA
Last day for course withdraw: November 2th, 2020

Instructor

Name: Dr. Robson E. De Grande
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Office: COSC – Brock University - Mackenzie Chown J311 / On-line on MS Teams
Office hours: weekly – during and around scheduled lecture hours (or by appointment)

Prerequisites

Computer Systems (COSC 2P13) – Minimum of 60 percent.

Attention. The student is not required to know Linux Operating System. However, the course relies heavily on Linux and open networking&security applications that run on it. The student is assumed to be familiar with such an Operating System or capable of learning its basics to follow the course.

Course Description

The "Computer Networks" course provides a view of the whole spectrum of networking topics, including fundamentals and advanced topics of computer networks. More detailed coverage of the fundamentals of networking is provided. A common, and widely-known top-down approach is employed: Application, Transport, Networking, and Link layers are visited and systematically explained. Advanced elements in terms of mobile networks, such as protocols in ad-hoc networks, are explained. Moreover, the course describes the security aspects of the networking setting, such as symmetric and asymmetric encryption, SSL, firewalls, wireless security, secure login, DNS, and Routing. The practical component of the course is added through group/individual assignments and labs that involve solving the design of a subnetwork setting and the implementation of secured networked applications.

References

Reference Books and Material::

1. *Computer Networking: A Top-Down Approach* (7th Edition) by James F. Kurose and Keith W. Ross. Publisher: Pearson; 6th edition (Apr. 26, 2016). ISBN-10: 9780133594140 & ISBN-13: 978-0133594140

2. *Network Security: Private Communication in a Public World* (2nd Edition) by Charlie Kaufman, Radia Perlman, and Mike Speciner. Publisher: Prentice Hall; 2nd edition (Apr. 22, 2002). ISBN-10: 0-13-046019-2 & ISBN-13: 978-0-13-046019-6
3. *Network Security Essentials: Applications and Standards* (6th Edition) by William Stallings. Publisher: Pearson; 6th edition. ISBN 978-93-528-6660-1 & eISBN: 9789353062996

Topic Outline

The course extends over ten weeks, and the course topics will be covered following the plan described in Table 1.

Table 1: Topic Outline

Week	Dates	Content	Book Reference
1	Sep 09 – Sep 11	**Introduction**	1.1
2	Sep 16 – Sep 18	**Application Layer**	1.2
3	Sep 23 – Sep 25	**Transport Layer**	1.3
4	Sep 30 – Oct 01	**Transport Layer**	1.3
5	Oct 07 – Oct 09	**Network Data Plane**	1.4
	Oct 14 – Oct 16	Reading weekd	
6	Oct 21 – Oct 23	**Network Control Plane**	1.5
7	Oct 28 – Oct 30	**Link Layer and LANs**	1.6
8	Nov 04 – Nov 06	**Wireless and Mobile Networks**	1.7
9	Nov 11 – Nov 13	**Wireless and Mobile Networks**	1.7
10	Nov 18 – Nov 20	**Secure Network - Introduction**	1.8, 2.1-6
11	Nov 25 – Nov 27	**Secure Network - Attacks & Measures**	2.17-18, 2.20-23, 2.25
12	Dec 06 – Dec 08	**IoT / NFV / SDN / ICN**	

Forms of Delivery

COSC 2P13 is completely on-line: all content and activities are on-line through the following tools:

- Sakai:
  - Lecture notes, short videos, codes;
  - Assessments: quizzes, assignments, tests, and exams;
  - Documents: syllabus;
  - Grades and announcements.
- MS Teams:
  - Real-time / live lectures;
  - Interactive sessions: Q&A and discussions;
  - Office hours.
- E-mail: Q&A and discussions.

Grading

The course is composed of the following activities: Assignments, Labs, Quizzes, a Midterm, and a Final Exam. The Grading Schema of the course, which includes all these activities, is described in Table 2.

Table 2: Grading Schema

Activity	**Marks**
Assignments	30%
Labs	30%
Quizzes	10%
Final Exam **	30%

** 40% of the exam is required to pass the course

Assignments

There will be four assignments throughout the term. The Assignment Marks will be the average mark of the four assignments; in other words, each assignment is worth 7.5 marks in final grade. The Tentative Schedule of the Assignments is defined in Table 3

Table 3: Tentative Assignment Schedule

Assignment	**Due**
1	October 1st @ 11:55pm
2	October 23rd @ 11:55pm
3	November 13th @ 11:55pm
4	December 8th @ 11:55pm

Laboratories

There will be 6 laboratories throughout the term; they will be held biweekly and on-line under TA/instructor's supervision through MS Teams. All students must be properly and previously registered in the laboratories to attend them. The participation in each laboratory session will be worth marks. The TA/instructor supervising the laboratory session will inform the session deadlines and forms of delivery for each session; the laboratory activities and tests must delivery at the end of the session, otherwise. The Lab Marks will be the average mark of the six laboratories; in other words, each lab is worth 5 marks in final grade. The Tentative Schedule of the Laboratories is defined in Table 4

Table 4: Tentative Laboratory Schedule

Assignment	**Due**
1	Week (Sep 16 – Sep 18)
2	Week (Sep 30 – Oct 01)
3	Week (Oct 21 – Oct 23)
4	Week (Nov 04 – Nov 06)
5	Week (Nov 18 – Nov 20)
6	Week (Dec 06 – Dec 08)

Quizzes

There will be six scheduled quizzes throughout the term. The four top marks out of the five quizzes will be considered when calculating the Quiz average in the final course grade. The tentative quiz schedule is defined in Table 5.

Table 5: Tentative Quiz Schedule

Quiz	Date
1	Sep 18 (W2)
2	Oct 01 (W4)
3	Oct 23 (W6)
4	Nov 06 (W8)
5	Nov 20 (W10)
6	Dec 08 (W12)

Attendance

Attendance and participation in on-line (real-time) activities is strongly recommended. Lectures cover more content than in the textbook or examples, as well as study cases, other than presented in text books and lecture notes.

Absence

Students must notify the instructor their absence as early as possible. In case of health emergencies, students must provide a proof, a doctor's notice or a copy of a medical prescription, so they area allowed to re-take exams or postpone "deliverables".

Assignment Delivery and Late Assignment Policy *

Unless the delivery methods and time are explicitly specified in class by the instructor, Assignments and Reports must be delivered through Sakai until 11:55pm of the due date. A penalty of 25% will be applied on late assignments. Late assignments are accepted until the Late Assignment Date, three days after the Assignment Due Date. No excuses are accepted for missing deadlines. However, deadline extensions may be granted under extenuating circumstances, such as medical or physical conditions; please note that granting the extension is under the instructor's discretion. However, deadline extensions may be granted under extenuating circumstances, such as medical or physical conditions; please note that granting the extension is under the instructor's discretion.

Plagiarism

Students are expected respect academic integrity and deliver evaluation materials that are only produced by themselves. Any copy of content, text or code, from other students, books, web, or any other source is not tolerated. If there is any indication that an activity contains any part copied from any source, a case will be open and brought to a plagiarism committee's attention. In case plagiarism is determined, the activity will be canceled, and the author(s) will be subject to the university regulations.
Due to the importance of Academic Integrity, the plagiarism tool Turnitin will be used to verify originality of all course works.

For further information on this sensitive subject, please refer to the document below:
`https://brocku.ca/academic-integrity/`

How to succeed in this course

This course covers a extensive amount of content and is very demanding on off-class activities. Students must keep up with their readings, assignments, as well as any other required activity.
In case you feel that you may lagging behind, please do not hesitate in contacting a TA and me as soon as possible, so we have enough time to correct the issue that is affecting your progress in the course.
This course requires problem-solving and critical thinking to apply the content delivered in class. Students are encouraged to talk and help each other to understand concepts, problems, and solutions. However, students are no allowed to help writing programs, assignments, and quizzes. Copies of pieces of code or text from class colleagues are considered acts of plagiarism!