Computer Systems

Course Information

Code: COSC 2P13
Credit hours: 36 hours
Location: Face-to-face (room TH242)
Period: January 10th – April 7th, 2023
Time: Tuesday (9:00am – 10:30am) and Friday (9:00am – 10:30pm)
Couse web page: in D2L (Brigh)
TAs: Penghan Yan, Tristan Navikevicius, and Yue Guan
Last day for course withdraw: March 10th, 2023

Instructor

Name: 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

COSC 2P03 (minimum 60 percent) and COSC 2P12 (minimum 60 percent) for COSC (single or combined), BCB, CAST, CNET and NEUR neurocomputing majors;
COSC 2P03 (minimum 60 percent), CPCF 1F25 and IASC 2P04 for GAMP majors.
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

This course is intended to provide fundamentals to Operating Systems and Networking. Thus, it essentially covers resource sharing, including file, processor, I/O, and memory management; concurrency, including context switching, interprocess communication, and synchronization; protection and security, including encryption; and distributed systems and networking, including ISO model and packet routing.

References

Text Books:

1. *Modern Operating Systems* (4th Edition) by Andrew S. Tanenbaum and Herbert Bos. Publisher: Pearson; 4 edition (Mar. 10, 2014). ISBN-10: 013359162X & ISBN-13: 978-0133591620
2. *Operating Systems: Internals and Design Principles* (9th Edition) by William Stallings. Publisher: Pearson; 9 edition (Mar. 23, 2017). ISBN-10: 0134670957 & ISBN-13: 978-0134670959
3. *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
4. *Operating System Concepts* (10th Ed) by Abraham Silberschatz, Greg Gagne, and Peter B. Galvin. Publisher: Pearson; 10th edition (Feb. 9, 2021). ISBN-10: 1119800366 & ISBN-13: 978-1119800361

Topic Outline

The course extends over twelve 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	Jan 10 – Jan 13	**Introduction**	1.1, 2.1, 2.2
2	Jan 17 – Jan 20	**Processes and Threads**	1.2, 2.3, 2.4
3	Jan 24 – Jan 27	**Memory Management**	1.3, 2.7, 2.8
4	Jan 31 – Feb 03	**Deadlocks**	1.6, 2.5, 2.6
5	Feb 07 – Feb 10	**Input and Output**	1.5, 2.11
6	Feb 14 – Feb 17	**File Systems** / (Midterm)	1.4, 2.12
	Feb 21 – Feb 24	Reading Week	
7	Feb 28 – Mar 03	**Networking I**	3.1 – 3.6, 2.17
8	Mar 07 – Mar 10	**Networking II**	3.1 – 3.6, 2.17
9	Mar 14 – Mar 17	**Multiple Processor Systems**	1.8, 2.9, 2.10
10	Mar 21 – Mar 24	**Distributed Systems**	1.8, 2.18, 2.19
11	Mar 28 – Mar 31	**Virtualization and the Cloud**	1.7, 2.14, 2.16
12	Apr 04 – Apr 07	**Security**	1.9, 2.15

Forms of Delivery

COSC 2P13 is completely face-to-face: all content are delivered physically (in classroom), and activities are on-line through the following tools:

- Face-to-face (in classroom):
  - Lectures.
- MS Teams:
  - Real-time / live lectures (if needed for social distancing) + interactive sessions (discussions);
  - Office hours;
- BrightSpace:
  - Lecture notes, short videos, codes;
  - Assessments: quizzes, assignments, tests, and exams (if needed);
  - Documents: syllabus;
  - Grades and announcements.
- E-mail: Q&A and discussions.

Grading

The course is composed of the following activities: Assignments, 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	15%
Quizzes *	10%
Midterm	25%
Final Exam **	50%

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

Midterm Test

There will be one midterm test in this course. The midterm will test students on the initial topics of the course. It will be held during one of the scheduled lectures. Tentative midterm date: **February 17th, 2023**.

Assignments

There will be four assignments throughout the term. The Assignment Mark will be the average of the marks of the four assignments. The Tentative Schedule of the Assignments is defined in Table 3

Table 3: Tentative Assignment Schedule

Assignment	Due
1	Feb 03 @ 11:59pm
2	Feb 24 @ 11:59pm
3	Mar 17 @ 11:59pm
4	Apr 07 @ 11:59pm

Quizzes

There will be six scheduled quizzes throughout the term. The four top marks out of the six quizzes will be considered when calculating the Quiz average in the final course grade. The tentative quiz schedule is defined in Table 4.

Table 4: Tentative Quiz Schedule

Quiz	Date
1	Jan 20 (W2)
2	Feb 03 (W4)
3	Feb 17 (W6)
4	Mar 10 (W8)
5	Mar 24 (W10)
6	Apr 07 (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 D2L until 11:59 pm of the due date.

Late submissions are not accepted. 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

Academic misconduct (which includes plagiarism and contract cheating) is NOT acceptable and will not be condoned. All borrowed work or ideas must be acknowledged. Work may be submitted to a phrase checking site. If you do not want your work to be submitted to a phrase checking site, alternative arrangements are available. More information on academic integrity is available here, and in the lectures. If convicted of academic misconduct, the penalty is normally zero for the submission (test, seminar, final examination) for a first infraction. If the academic misconduct occurs in one (or more) question(s) in the test or examination, a mark of zero will be given for the test or examination.

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!