CIS*3110 Operating Systems
Winter 2023

School of Computer Science

1 INSTRUCTIONAL SUPPORT

Section 01

Instructor: Dr. Denis Nikitenko
Office: TBA
Email: cis3110@socs.uoguelph.ca
Office hours: TBA. By appointment only. Details will be posted on the course website. Note: Weekly hours may vary during the semester to better accommodate student demand and instructor availability.

Pre-requisites: CIS*2520, (CIS*2030 or ENGG*2410)
Credit Weight: 0.5

Teaching Assistants:
Zhentao Huang
Araftoz Kaur
Elnaz Balagafsheh Rabieinejad
Fatemeh Safari
Izabela Savic
Kevin Sullivan

Email: cis3110@socs.uoguelph.ca
Office Hours: See lab time below

Timetable

Lectures:
Tuesday, Thursday, 2:30 PM - 3:50 PM MACN (MacNaughton Building), Room 105

Lab times:

Monday, 9:30 AM - 10:20 AM MACS, Room 129 / virtual
Monday, 4:30 PM - 5:20 PM MACN, Room 118 / virtual
Tuesday, 8:30 AM - 9:20 AM MACS, Room 129 / virtual
Wednesday, 2:30 PM - 3:20 PM MACS, Room 129 / virtual
Wednesday, 4:30 PM - 5:20 PM MACN, Room 118 / virtual
Wednesday, 7:00 PM - 7:50 PM MCLN, Room 101 / virtual
Friday, 9:30 AM - 10:20 AM ROZH, Room 106 / virtual

The lab times will be used for advising and consulting with the Teaching Assistants, which will be done online. Students will be able to schedule one-on-one online meetings with the Teaching Assistants.

Please note that, if necessary, the lab times may also be used for additional tutorials. These tutorials will be announced in advance.

2 LEARNING RESOURCES

2.2 Course Website

Course material, news, announcements, and grades will be regularly posted to the CIS*3110 website which can be found at https://moodle.socs.uoguelph.ca. You are responsible for checking the site regularly.

- Lecture Information: Selected notes will be posted on the course website as instructors have time to make them available. You are expected to take your own notes during lecture.
- Labs and Tutorials: Selected tutorial and lab materials will be available on the course website.
- Assignments: Assignment descriptions will be posted on the course website. Assignments are submitted via the course website.

2.3 Required Textbook

"Operating System Concepts", 10th edition, by A. Silberschatz, P. B. Galvin, and G. Gagne (ISBN: 978-1-119-32091-3). A 150-day e-copy rental is available from the publisher (Wiley) and is the recommended version for this course.

2.3.1 Recommended reference book

"Advanced Programming in the UNIX Environment", 3rd edition, by R. Stevens and S. Rago (ISBN: 978-0-321-63773-4)

2.4 Calendar Description

This course covers operating systems in theory and practice by focusing on the components in a system: scheduling, resource allocation, process management, multi-programming, multi-tasking, I/O control, file systems, and mechanisms for client-server computing using examples from contemporary operating systems.

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index

3 ASSESSMENT

3.1 Dates and Distribution

Assessments
Assignments (60%: 3 @ 20% each) - Assignment 1: Wednesday, February 1 - Assignment 2: Wednesday, March 1 - Assignment 3: Wednesday, March 22 Take-home final exam (40%): - Issued: Wednesday, April 5 - Due: Thursday, April 13

3.1.1 Final grade calculation

The final grade is the weighted sum of all assessments shown above, using the weights indicated in the list above.

3.2 Course Grading Policies

Late assignments: All assignments are due at the time/date indicated in the assignment description. Late assignments will be accepted for **36 hours** after the deadline and penalized at **2% per hour**. Assignments that are more than 36 hours late will **not** be accepted and will automatically receive the grade of **zero** (0). See below for compassionate exceptions.

Compiler errors/warnings: Program code which does not compile will not be accepted for marking and a grade of **zero** (0) will be assigned. Code that does not compile "clean" will lose marks for compiler warnings. Code **must** compile and run on the platform specified in the assignment description.

Submission errors: Failure to submit assignments correctly (e.g., incorrect file names, faulty/missing build scripts, etc.) will result in a mark penalty.

Regrades: Students may request a regrade of an assignment if the marker has made an error in grading. The original submission will be entirely regraded and a new mark will be assigned. It is possible for a mark to go down, go up, or remain unchanged as a result of a regrade. Students must request a regrade via the Regrade dropbox on the course website within 5 calendar days of receiving the assignment grade. No other regrade requests will be accepted. If an assignment has been regraded, it will not be regraded again.

Accommodation: When You Cannot Meet a Course Requirement: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, contact the instructor. Please note that work commitments will not constitute grounds for academic consideration. Academic consideration will not be granted for reasons related to deliverables in other courses.

Please note that **all** extension requests for academic consideration - including those made by students registered with SAS - **must** be made prior to the assessment (assignment/test/project) due date and time. **No** academic consideration requests will be accepted once the assessment due date and time have passed.

Please see below for specific details and consult the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please make an appointment to meet your course instructor. Please see below for specific details and consult the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

COVID-19 and Safety: For information on current safety protocols, follow these links:
https://news.uoguelph.ca/return-to-campuses/how-u-of-g-is-preparing-for-your-safe-return/
https://news.uoguelph.ca/return-to-campuses/spaces/#ClassroomSpaces

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course email address within two weeks of the start of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

3.3 Course Learning Outcomes

1. Discuss and evaluate synchronization and control techniques.
2. Identify and discuss the function of major operating system components.
3. Evaluate tradeoffs in virtual memory management algorithms.
4. Evaluate the function and calculate efficiencies in virtual memory implementation strategies.
5. Compare and evaluate filesystem design.
6. Review performance of scheduling strategies.
7. Analyze kernel level security concerns and permission strategies.

4 TEACHING AND LEARNING ACTIVITIES

4.1 Lecture Schedule

Please note that the list and schedule of topics below is approximate and may be revised and updated as necessary to better fit the flow of the course.

Lectures	Lecture topics	Assignments
Week 1 (Jan 10, 12)	Introduction	
Week 2 (Jan 17, 19)	Overview of operating systems	
Week 3 (Jan 24, 26)	Processes	
Week 4 (Jan 31, Feb 2)	Threads	Assignment 1 due
Week 5 (Feb 7, 10)	CPU scheduling	
Week 6 (Feb 14, 16)	Synchronization	
	Reading week	
Week 7 (Feb 28, Mar 2)	Thread synchronization	Assignment 2 due
Week 8 (Mar 7, 9)	Memory management	
Week 9 (Mar 14, 16)	Virtual Memory	
Week 10 (Mar 21, 23)	File systems	Assignment 3 due
Week 11 (Mar 28, 30)	Security, protection	
Week 12 (Apr 4, 6)	Advanced topics, review	Take-home exam issued
Week 13 (exams)		Take-home final exam due

4.4 Important Dates

Monday, January 9: First day of class
Monday, February 20 - Sunday, February 26 - NO CLASS
Friday, April 7: No Classes Scheduled -- classes rescheduled to Monday, April 10
Monday, April 10: Last day to drop classes, last day of CIS*3110

5 ROLES AND RESPONSIBILITIES

5.1 Communication & Email Policy

Please use lectures, lab sessions, and the website discussion forum as your main opportunities to ask questions about the course. Questions that are specific to your particular situation may be emailed to cis3110@socs.uoguelph.ca and will be answered by one of the instructional team. Extremely private communication should be conducted by making an appointment with the course instructor.

Major announcements will be posted to the course website and the discussion forums. It is your responsibility to check the course website regularly. As per university regulations, all students are required to check their <mail.uoguelph.ca> e- mail account regularly: e-mail is the official route of communication between the University and its students.

5.2 Recording of materials

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course and may not be posted on any public space unless further permission is granted.

5.3 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected notes will be made available to students on the course website but are not intended to be stand-alone. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for exams and assignments.

5.4 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures, labs and help sessions. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed as early as possible. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

5.5 General course policies

Do not redistribute recorded interactive discussions that involve your classmates. This includes advising times and question and answer sessions with the instructor.

Online activities such as advising times, question and answer sessions, and interactive lectures may be recorded by the instructor or TAs and posted to the course website. By taking this course you are agreeing that your participation in these activities can be used in this manner. If you do not wish to have your image or voice recorded as part of these activities then either do not take this course or do not ask verbal questions during these activities.

A reliable internet connection that is sufficient for online learning is necessary for this course. If you do not have a sufficiently fast and reliable internet connection, then you may not be able to view or download lectures or other course material. It may also not be possible to attend online advising with teaching assistants or the instructor.

This course is offered in the eastern standard time zone (EST). While taking this course then you may be required to attend online activities such as interactive lecture components, advising times, labs, and assignment evaluation sessions between 8:30am and 5:00pm EST. The lectures and labs are an integral par of the corse, and you are expected to be available during the scheduled lecture times and lab times for consultation with the instructor and TAs.

Keep copies of assignments which you have submitted. You may be asked to resubmit assignments at a later time.

6 ACADEMIC INTEGRITY

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. All students who take a SOCS course must pass the **Academic Integrity Self Test.**

For educational purposes, instructors impose conditions on assignments that may limit students' permission to collaborate with others or to utilize external sources (including, but not limited to, software, data, images, text, etc.). Any permitted utilization must be done with proper references. Aiding and abetting is a punishable offence; students must be careful not to help others commit offences by giving out solutions or providing to access computer accounts. Instructors may use automated tools to detect possible cases of academic misconduct.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

The SOCS Academic Integrity Unit:
http://moodle.socs.uoguelph.ca/course/view.php?id=2 Login with your central login credentials. The key to use is "imhonest".

7 ACCESSIBILITY

The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day.

More information: www.uoguelph.ca/sas