LAND ACKNOWLEDGEMENT
The University of Windsor sits on the traditional territory of the Three Fires Confederacy of First Nations, which includes the Ojibwa, the Odawa, and the Potawatomi. We respect the longstanding relationships with First Nations people in this place in the 100-mile Windsor-Essex peninsula and the straits – les détroits – of Detroit

INSTRUCTOR:	**Dr. Imran Ahmad**

E-mail : imran@uwindsor.ca
Office Location: LT 8112
Phone : (519) 253-3000 / 3715

Lecture : Tue/Thu: 10:00 AM – 11:20 PM in TC 200

Office Hours: Tue/Thu: 11:30 AM – 12:30 PM (in office) **OR** by **appointment ONLY.**

Note: *As per ITS policy,* *only an email originating from a valid University of Windsor student account* *will be answered.* To get a reply of an email, please include your full name, student ID and related course number in your correspondence. *Do not spam with multiple or lengthy emails.*

Generally, you will receive a response of your email within 24 hours (weekends excluded). If you don't, it is likely because either the:

1. Answer to your email is in the Course Outline.
2. The matter may have already been discussed in detail during class or its answer is posted on the Brightspace.

*This is a tentative course outline. The outline available after the end of second week of semester will be deemed correct and official. *

TEACHING ASSISTANT(S):

*Please refer to the **Brightspace** for names of GA, contact information and updated office hours.*

The teaching assistant(s) will be holding regular weekly office hours dedicated to helping students. It is highly recommended that you take advantage of this resource by seeking interactive assistance toward understanding the course materials and guidance for completing the homework. Graders are also accessible to review your graded work and help make corrections or fix grading errors.

If you are facing difficulties in the course, please contact the instructor or the teaching assistant(s). You are expected to spend sufficient time completing all the readings and the assigned work. If you are not able to get hold of the teaching assistant(s) during posted office hours or do not get a timely response from them, please report the matter promptly to the course instructor with the situation details.

If you identify an exceptional assistant who goes above and beyond, please inform the instructor and consider nominating the person for related university/faculty awards for their commitment.

The School of Computer Science provides free tutoring services. Please check: https://tutor.myweb.cs.uwindsor.ca/

PRE-REQUISITES: Students **MUST** have **all** of the prerequisites (COMP 2120, COMP 2540, COMP 2560 & COMP 2650/COMP 2660)

COURSE DESCRIPTION: Operating system is an essential part of a computer system. This course will contain a general study of fundamental concepts pertinent to the operating system design and operation and various performance related issues and policies. In this course, we will study and discuss operating system services, primary components of multi-programming operating systems, CPU scheduling, concurrent processes, process synchronization and inter-process communication, deadlocks, memory management, file systems, virtual memory, disk scheduling. UNIX (and/or MS Windows) will be used as a case examples. The course learning outcomes can be found on the course related Blackboard site.

This description is from the official senate-approved calendar

LEARNING OUTCOMES: Please note that the learning outcomes are posted on Brightspace. (source: https://ctl2.uwindsor.ca/cuma/public/courses/pdf/b8e5151e-246b-494c-a358-a8668a0e2d9a)

REQUIRED TEXTBOOK:	A. Silberschatz, P. Galvin & G. Gagne, *Operating System Concepts* (10th Edition), Willey, ISBN: 978-1-119-80036-1 (Print, January 2021) OR 978-1-119-32091-3 (E-Book, April 2018). (You will be able to use even older editions of the book. However, instructor will NOT be responsible of any changes in the contents/topics
COURSE SCHEDULE:	Following is a tentative list of topics (not in a specific order) to be covered.

- Introduction to Computer Systems and OS
- OS Structure
- Processes
- CPU scheduling,
- concurrent processes
- process synchronization
- inter-process communication

- Threads
- deadlocks
- memory management
- file systems
- virtual memory
- disk scheduling
- Misc topics (time permitting)

COURSE PLAN: Course has several important components as described below:

- **HOME WORK ASSIGNMENTS:**

    There will be up to 6 <u>individual</u> written and/or programming homework assignments. All homework assignments will be **due** at the **beginning of the class time** on its due date. **Late submission** of ANY homework assignment **is NOT** allowed (submission time will be determined by the timestamp by the Brightspace). All assignments **MUST** be submitted electronically through Brightspace. More details about homework assignments will be provided later. Assignments **MUST** be done **individually** with no copying from **ANY** other source (see policy on cheating/copying). For programming assignments, **NO** sample solution will be provided.

- **EXAMINATIONS:**

    Besides a comprehensive final exam, there will be three midterm exams. If you miss a midterm exam (or all), its percentage will be carried over to the next exam (or the final as the case may be) but **ONLY** for valid and verifiable reasons as explained in "Absence Policy" below. If you miss the final exam and have valid and verifiable reason, you will be required to write a makeup exam on the alternate exam day announced by the University. If you suspect that you will be unable to write an exam because of **a <u>valid and verifiable</u>** reason, you **MUST** give me prior notice, before the start of the exam. Even if you are sick or face unavoidable circumstances, you **MUST** notify me or the school through phone, email, etc. along with necessary documentary evidence that **MUST be** received - in original - within 7 calendar days of the exam.

    Unless mentioned otherwise, all of the exams will be closed book, closed notes and closed neighbors. Also please keep in mind that progressively exams will keep on getting difficult with the first midterm being the easiest among all. Only for valid, verifiable, and approved cases, there will be a makeup exam on the alternate exam day **Tuesday Apr. 23, 2024 (time to be announced later)** and will cover all of the material covered during the entire semester. The exact place of makeup exam will be announced through the "Announcement" section of the Brightspace and it will be your responsibility to make yourself familiar with it. <u>There will be no makeup for the makeup exam</u>. If you miss both the scheduled final and the makeup exams but can provide satisfactory evidence, an average of the taken exams and spot quizzes minus 25% will be used to compute the final percentage for the missing exam.

    > ***Please also note that sample exam or solutions for ANY EXAM will be NOT be provided.***

ABSENCES DUE TO MEDICAL OR OTHER EXTENUATING CIRCUMSTANCES: Medical leaves, illness, death (in the family), and other difficult circumstances as determined in Senate Bylaw 54 are at times unavoidable and would interrupt your academic career. You must report any issues to the instructor as soon as possible prior to considering any academic accommodations. Have your doctor fill up the "UWindsor Student Medical Certificate" available from the course Brightspace site. A doctor's note stating that "*patient states that I am sick*" or "*had headache*" or something similar without professional medical opinion will NOT constitute a valid reason and will NOT be accepted. A medical note MUST be obtained on the day of claimed sickness unless it is not medically possible, and the doctor's note must clearly state it. In the <u>absence of UWindsor Student Medical Certificate fulfilling above conditions (and a proper proof for other reasons), NO makeup exam (or carrying over percentage to the next one) will be allowed</u>. REMMEBER having a medical note **DOES NOT** automatically make you eligible for a makeup exam. Instructor reserves the right to **REJECT** a medical note. All requests for alternate considerations on medical grounds or other difficult matters must be made in writing (email) to the instructor along with supporting documents within seven calendar days of the missed exam/assignment. No alternate accommodations will be considered after the end of the course.

MAKEUP AND MISSED ASSESSMENT POLICY: If you miss an exam, assignment, or other assessment in the course you will receive a zero mark for the missed work. If you wish to have alternate considerations due to a valid reason (as per senate bylaw 54) you must inform the instructor in writing (email) as soon as possible, preferably before the assessment, and not later than seven calendar days. Considerations for carrying over percentage to the next exam (or make-up) will be done on case-by-case basis on compassionate grounds while maintaining fairness as much as possible. No alternate considerations will be given to any missed assessment if the instructor is not informed within seven calendar days after its due date. The instructor **will refuse** any **unsubstantiated** and/or **late** requests.

ATTENDANCE	Though not required, attendance is important. Lots of details and information will be provided during the lectures and you are responsible for taking proper notes. All of the HomeWorks and quizzes will be primarily (though not exclusively) based on the material presented in class. Lectures will also include necessary information related to the assignments/project.

COURSE EVALUATION:

Homework Assignments:	10 %	(Up to six homework assignments)
Spot Quizzes (as per senate policy)	05 %	3 – 5; maximum points for each will be less than 2%
Midterm 1:	20 %	(Date/time: Thu. Feb. 08, 2024 @ during class time)
Midterm 2:	25 %	(Date/time: Thu. Mar. 14, 2024 @ during class time)
Final: (comprehensive/cumulative)	40 %	(Date/time will be announced by the Office of Registrar)

There will be **NO** incomplete grade given under any circumstances.

GRADING:

A numeric grade on a scale of 0 to 100 will be assigned (rounded integer).

PASSING GRADE: A minimum grade of 50% (for undergraduate students) is required to pass this course. However, your overall program may have higher requirements to maintain good standing; please consult your program requirements and plan accordingly.

VOLUNTARY WITHDRAWAL (DROPPING THE COURSE): You may drop a course within the first 2 weeks add/drop period without it showing up on your academic record. Please check with the Registrar's office calendar on the important dates for withdrawing voluntarily from a course after the add/drop period should you feel you need to withdraw. It is strongly recommended that you seek academic advice from your instructor or an academic advisor prior to withdrawing from courses.

SET: Student Perception of Teaching (SPT) will be administered in the **last 2 weeks of** classes.

Important Dates:

- January 8:   First day of classes
- January 21:   Last day for late registration for Winter 2024 classes (to add classes)
- February 5:   Winter financial drop date.
- February 17 – 25:   Winter Term Reading Week
- March 17:   Last day to voluntarily withdraw from Winter classes (to drop classes)
- March 29:   Good Friday (Statutory Holiday – University closed)
- April 8:   Last day of classes
- April 11- April 22:   Winter Final Exams
- April 23:   Alternate Exam Day

SUPPORT CONTACTS:

The School of Computer Science has a team of support staff and access to student academic advisors to assist you through any inquiries you may have about our courses/programs. Please use one of the following emails:

The School of Computer Science has a team of support staff and access to student academic advisors to assist you through any inquiries you may have about our courses and programs. Please use one of the following emails:
For CompSci undergraduate programs and advising, including IT certificate: csinfo@uwindsor.ca
For CS Tutors (free tutoring support for all CS undergrad courses): http://tutor.cs.uwindsor.ca/
For Computer Science Society: https://css.uwindsor.ca/
For CompSci graduate programs (MSc, MSc-AI stream, and PhD): csgradinfo@uwindsor.ca
For CompSci professional graduate programs (MAC/MAC-AI stream): macprogram@uwindsor.ca
For the office of the Director of the School of Computer Science: csdir@uwindsor.ca
For CompSci technical support: https://help.cs.uwindsor.ca/
For International Student Centre: https://www.uwindsor.ca/international-student-centre/
For Student Accessibility Services: https://www.uwindsor.ca/studentaccessibility/
For other general inquiries: https://ask.uwindsor.ca/
For Student counselling services (ext. 4616): https://www.uwindsor.ca/studentcounselling/
For Student health services (ext. 7002): https://www.uwindsor.ca/studenthealthservices/
For Student Peer Support Centre (ext. 4551): https://www.uwindsor.ca/studentexperience/wellness/
For USci Faculty of Science student support network: https://www.uwindsor.ca/science/usci/

> *Need help?*
> *My Student Support Program (MySSP) is an immediate and fully confidential 24/7 mental health support that can be accessed for free through chat, online, and telephone. This service is available to all University of Windsor students and offered in over 30 languages.*
> *Call: **1-844-451-9700**, or visit **https://myissp.com/***

STUDENT ACCOMMODATIONS:

Students with disability: Students who require academic accommodations in this course due to a documented disability must contact an Advisor in Student Accessibility Services (SAS) to complete SAS Registration and receive the necessary Letters of Accommodation. After registering with SAS, you must present your Letter of

Accommodation and discuss your needs with the course instructor as early in the term as possible. Please note that deadlines for the submission of documentation and completed forms to SAS are available on their website: http://www.uwindsor.ca/studentaccessibility/

Exam conflicts: If you have a conflict with two exams at the same time, you will need to talk to both instructors and ask which one is willing to move your exam to a different day or time.

You have a conflict with three or more final examinations in a consecutive time slot over a 24-hour period. Three or more final examinations in one calendar day may apply to have one examination rescheduled on an alternative day. *View the Office of the Registrar Alternative Final Exams web page.*

- *Application for Alternative Final Examination(s) Due to Conflict with Religious Conviction*
- *Application for Alternative Final Examination(s) Due to 3 Exams Scheduled on the Same Day*

Religious Observances: Requests for accommodation of specific religious or spiritual observance must be presented to the instructor no later than 2 weeks prior to the conflict in question (in the case of final examinations within two weeks of the release of the examination schedule). In extenuating circumstances, this deadline may be extended. If the dates are not known well in advance because they are linked to other conditions, requests should be submitted as soon as possible in advance of the required observance. Timely requests will prevent difficulties in arranging constructive accommodations. religious_accommodation_for_students.01mar2013.web_ver.pdf (uwindsor.ca).

PRIVACY AND COPYRIGHTS:	*CONTENT CONFIDENTIALITY:* Lectures, examinations, quizzes, assignments, and projects given in this course are protected by copyright. Reproduction or dissemination of examinations or the contents or format of examinations/quizzes in any manner whatsoever (e.g., sharing content with other students or websites, etc.), without the express permission of the instructor, is strictly prohibited. Students who violate this rule or engage in any other form of academic dishonesty will be subject to disciplinary action under **Senate Bylaw 31:** Student Affairs and Integrity. *RECORDING OF LECTURES:* Lectures and discussions can be recorded **by requesting explicit permission from the instructor**. Students planning to do so shall send a request (via email is sufficient) before the lecture is delivered. Students, however, are not allowed to post or share any recorded material to any other individual or party outside of this course. *See* Senate Policy on recording lectures.
SAFETY, ACADEMIC INTEGRITY, AND NON-ACADEMIC MISCONDUCT:	*EQUITY, DIVERSITY, AND INCLUSIVENESS (EDI):* This course, along with all its components such as lab sections are, without question, safe places for students of all races, genders, sexes, ages, sexual orientations, religions, disabilities, and socioeconomic statuses. Disrespectful attitude, sarcastic comments, offensive language, or language that could be translated as offensive and/or marginalize anyone are absolutely unacceptable. Immediate actions will be taken by the instructor to protect the safety and comfort of the students. An ethnically rich and diverse multi-cultural world should be celebrated in the classroom. All members are required to report any instances of sexual misconduct, including harassment and sexual violence, to the Sexual Misconduct Response & Prevention Office so that the victim may be provided appropriate resources and support options.

- https://www.uwindsor.ca/sexual-assault/
- For campus police call 519-253-3000 ext. 4444 for emergency; 1234 for non-emergency issues.

POLICY ON CHEATING: Unless mentioned otherwise, you are expected to do all of your work on all components of this course (homework assignments, quizzes and exams) individually, without the help of others. In cases of suspected cheating, you will get **zero points** for that assignments, and/or quiz or question in exam.

ACADEMIC INTEGRITY: Please refer to: https://www.uwindsor.ca/academic-integrity/

As defined in the University of Windsor's **Student Code of Conduct**, plagiarism is the act of copying, reproducing or paraphrasing significant portions of one's own work, or someone else's published or unpublished material (from any source, including the internet), without proper acknowledgement, representing these as new or as one's own.

Tips and resources to help you prevent plagiarism:
https://www.uwindsor.ca/academic-integrity/sites/uwindsor.ca.academic-integrity/files/tips_for_preventing_plagiarism.pdf

The instructor will put a great deal of effort into helping students to understand and learn the material in the course. However, the instructor will not tolerate any form of cheating. The instructor will report any suspicion of academic integrity to the Director of the School of Computer Science. If sufficient evidence is available, the Director will begin a formal process according to the University Senate Bylaws which will lead to more review, a strict punishment if convicted, and a note on your permanent student record.

The following behaviours will be regarded as cheating:
- *Copying assignments or quizzes or presenting someone else's work as your own.*
- *Allowing another student to copy an assignment/project from you and present it as their own work; protect your own work and never share it with anyone!*
- *Copying from another student or any other unauthorized source during a test or exam.*
- *Falsifying your identity during the exam or having someone else assist or complete your assessment.*

- *Referring to notes, textbooks, and any unauthorized sources during a test or exam (unless otherwise stated).*
- *Speaking or communicating without permission during a test or exam.*
- *Not sitting at the pre-assigned seat during a test or exam.*
- *Communicating with another student in any way during a test or exam.*
- *Having unauthorized access to the exam/test paper prior to the exam/test.*
- *Explicitly asking a proctor for the answer to a question during an exam/test.*
- *Modifying answers after they have been marked.*
- *Any other behavior which attempts unfairly to give you some advantage over other students during the grade-assessment process.*
- *Refusing to obey the instructions of the officer in charge of an examination.*

The list given above is not exhaustive. More examples are given in Appendix A, Senate Bylaws 31 – Complete guidelines and procedures on the sanctions imposed by the university are also listed in Table A.1 of the Senate Bylaws 31.

In this course any assessment that is deemed plagiarized or in violation of the academic integrity policy will *NOT BE GRADED and receive a grade of **ZERO** unless a different ruling is provided by the adjudication committee formally reviewing the case.* This is regardless of who cheated from whom. In other words, you are responsible for your work.

Plagiarism detection software:
Plagiarism-detection software *SafeAssign* will be used for all student assignments in this course. You will be advised how to submit your assignments. Note that students' assignments that are submitted to the plagiarism-detection software become part of the institutional database. This assists in protecting your intellectual property. However, you also have the right to request that your assignment(s) not be run through the student assignments database. If you choose to do so, that request must be communicated to the course instructor in writing at the beginning of the course. The instructor reserves the right to choose another plagiarism detection software and students will be notified once it is used.

Use of Generative AI (Artificial Intelligence) tools is prohibited:
Students cannot use Generative AI tools (e.g., ChatGPT, Bard) to produce assignments or reports. Any assignments or reports submitted by students must be their own work and must be free from AI-generated content.

"Once the game is over, the king and the pawn go back into the same box" .... (*Italian Proverb*)