Course Outline
Databases II (COMPSCI 4411/9538 A)

1. Course Information

Course Information
- Course name: Databases II (Advanced Databases)
- Course number: COMPSCI 4411/9538 A
- Academic term: Fall 2022
- Location: NSC-7
- Time: Tuesdays 12:30-2:30 pm and Thursdays 12:30-1:30 pm
- There is no laboratory or tutorial.

List of Prerequisites
- COMPSCI 3319A/B or COMPSCI 3120A/B

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Instructor Information

Instructors	Email	Office	Phone	Office Hours
Dr. Mostafa Milani (Course Coordinator)	mostafa.milani@uwo.ca	MC384		Thursdays 4:00-5:00 pm
TA TBD				

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. The preferred email address to contact the instructor and TAs is cs4411@uwo.ca.

Office hours are online (in Zoom). TA's office hours TBD.

3. Course Syllabus, Schedule, Delivery Mode

Databases II (Advanced Databases) is an advanced course in database systems with topics such as data storage, indexing, query execution, query optimization, advanced concurrency control, recovery concepts, and parallel and distributed databases.

Course-level learning outcomes:

- Explain how a database management system stores data and allows for quick access.
- Explain the purpose of indexes and database catalogs and how a database management system creates and manages them.
- Explain how a database answers queries and how to choose and execute an optimal plan to run a query evaluation.
- Explain how a database evaluates multiple queries concurrently and optimizes the query evaluation process.
- Determine when to use multiple databases across devices for various applications.
- Improve the performance of databases using tuning techniques.

The course will be delivered in person during the lecture hours. Lecture notes will be posted online in OWL. Office hours are online (in zoom) and require completing a sign-up sheet as outlined in OWL.

Table of contents (tentative):
- Introduction (Week 1, **Sep 8**)
- Data Storage (Week 2)
- Indexing and File Organizations (Weeks 3 and 4)
- Query Evaluation (Weeks 5 and 6)
- **Midterm Exam (Oct 18, during the lecture time, the location TBD)**
- Query Optimization (Week 7)
- Transaction Management and Concurrent Evaluation (Week 8)
- Transaction Management and Crash Recovery (Week 9)
- Parallel and Distributed Databases (Week 10)
- Database Tuning (Week 11)
- NoSQL Databases (Week 12, **Dec 8**)

Key Sessional Dates:
Classes begin: September 8
Fall Reading Week: October 31 – November 6
Classes end: December 8
Exam period: December 10 – 22

Contingency plan for an in-person class pivoting to 100% online learning
In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, affected course content will be delivered entirely online, either synchronously (i.e., at times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor.

4. Course Materials

The lectures are from the following textbook, which is available online:
- *Database Management Systems*, 3rd Edition, by Gehrke and Ramakrishnan
Supplementary textbooks, also available online:
- *Database Systems Concepts,* 7th Edition, by Silberschatz, Korth and Sudarshan
- *Database Systems: The Complete Book*, 2nd Edition, by García-Molina, Ullman, and Widom

Students are responsible for checking the course OWL site (http://owl.uwo.ca) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

All course material will be posted to OWL: http://owl.uwo.ca.

If students need assistance with the course OWL site, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

The overall course grade will be calculated as listed below:
- Assignments   15% (three assignments, 5% each)
- Midterm exam   30%
- Final exam   40%
- Project   15%

Tentative list of subjects and dates:
- Assignment 1: data storage and indexing (deadline: Oct 22, 11:55 pm)
- Assignment 2: query answering and optimization (deadline: Nov 19, 11:55 pm)
- Assignment 3: transaction management and crash recovery (deadline: Dec 3, 11:55 pm)
- Midterm exam: Weeks 1-6 (date and time: October 19, 12:30-2:30 pm)
- Project (proposal's deadlines: Oct 15, 11:55 pm, final report's deadline: Dec 8, 11:55 pm)
- Final exam: Weeks 1-12 (date and time: TBD)

Project: Students are expected to complete a course project. The topic of the project must be related to database management systems and the course material, and it will be chosen in consultation with the instructor. Students will research the topic and present their ideas and findings in a written report and a recorded presentation at the end of the term. You will be graded on your written report, presentation, and other deliverables. More detail about the project and some suggested subjects will be posted on OWL.

6. Student Absences

Lecture participation is encouraged but is not mandatory.

If you are unable to meet a course requirement due to illness or other serious circumstances, please follow the procedures below.

Assessments worth less than 10% of the overall course grade: In case of missing assignments, the final exam will be reweighted to cover their marks. The first missing assignment do not require providing medical or supporting documentation. For the second or more missed assignments, the student must provide valid medical or supporting documentation otherwise, the student will receive zero marks for the assessment.

Assessments worth 10% or more of the overall course grade: There is no make-up for the midterm exam. If a student misses the midterm exam, they need to provide valid medical or supporting documentation, and their final will be reweighted to cover the mark for the midterm. Failure to provide proper documentation will result in zero mark for the midterm.

Students will fail the course if they obtain less than 50% of the sum of the marks for the midterm exam and the final exam, or if they fail to deliver their final project.

For work totalling 10% or more of the final course grade, you must provide valid medical or supporting documentation to the Academic Counselling Office of your Faculty of Registration as soon as possible. For further information, please consult the University's medical illness policy at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf.

The Student Medical Certificate is available at

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Absences from Final Examinations

If you miss the Final Exam, please contact the Academic Counselling office of your Faculty of Registration as soon as you are able to do so. They will assess your eligibility to write the Special Examination (the name given by the University to a makeup Final Exam).

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (e.g., more than 2 exams in 23-hour period, more than 3 exams in a 47-hour period).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See the Academic Calendar for details (under Special Examinations).

6. Accommodation and Accessibility

Religious Accommodation
When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at

https://multiculturalcalendar.com/ecal/index.php?s=c-univwo.

Accommodation Policies
Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic Accommodation_disabilities.pdf.

7. Academic Policies

The website for Registrarial Services is http://www.registrar.uwo.ca.

In accordance with policy,

https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf,

the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at their official university address is attended to in a timely manner.

Electronic devices are not permitted on tests and exams.

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com).

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

8. Support Services

Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on adding/dropping courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: https://www.uwo.ca/sci/counselling/.

Students who are in emotional/mental distress should refer to Mental Health@Western (https://uwo.ca/health/) for a complete list of options about how to obtain help.

Western is committed to reducing incidents of gender-based and sexual violence and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced sexual or gender-based violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts at

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Accessible Education at

http://academicsupport.uwo.ca/accessible_education/index.html

if you have any questions regarding accommodations.

Learning-skills counsellors at the Student Development Centre (https://learning.uwo.ca) are ready to help you improve your learning skills. They offer presentations on strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: https://www.uwo.ca/se/digital/.

Additional student-run support services are offered by the USC, https://westernusc.ca/services/.