

# **Databases II (Advanced Databases) COMPSCI 4411/9538 Course Outline**

## **1. Course Information**

### **Course Information**

- Course name: Databases II (Advanced Databases)
- Course number: COMPSCI 4411/9538 A
- Academic term: Fall 2025
- [REDACTED]
- Time: Tuesdays 12:30-2:30 pm and Thursdays 12:30-1:30 pm

### **List of Prerequisites**

- COMPSCI 3319A/B or COMPSCI 3120A/B

Unless you have either the prerequisites for this course or written special permission from the Department of Computer Science to enroll in it, you may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on your academic record. This decision may not be appealed.

## **2. Instructor Information**

<b>Instructors</b>	<b>Email</b>	<b>Office</b>	<b>Phone</b>	<b>Office Hours</b>
Dr. Mostafa Milani (Course Coordinator)	mostafa.milani@uwo.ca	[REDACTED]		Thursdays 4:00-5:00 PM
TA TBD				

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. Please use [cs4411@uwo.ca](mailto:cs4411@uwo.ca) for any course related questions and include the exact text “[CS 4411]” at the beginning of your email title; otherwise, your email will not be answered.

Office hours are online (in Zoom) and require completing a sign-up sheet as outlined in OWL.  
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, and crash recovery concepts.

#### Course-level learning outcomes:

- Describe how a database management system stores data and provides efficient access.
- Explain the role of indexes and database catalogs, and how they are created and maintained.
- Describe how queries are processed and how optimal execution plans are chosen and executed.
- Explain how a database handles concurrent queries and optimizes their execution.
- Identify scenarios where multiple databases across devices are appropriate for specific applications.
- Apply tuning techniques to improve database performance.

The course will be delivered in person during the lecture hours. Lecture notes will be posted online in OWL.

#### Table of contents (tentative):

- Week 1: Introduction
- Week 2: Data Storage
- Weeks 3 and 4: Indexing and File Organizations
- Weeks 5 and 6: Query Evaluation
- Week 7: Query Optimization
- **Week 8: Midterm Exam, Oct 21 (Tue), during lecture time, in class**
- Reading week (Nov 3-9)
- Weeks 9 and 10: Transaction Management
- Week 11: Parallel and Distributed Databases
- Week 12: Database Tuning
- Week 13: NoSQL Databases and Course Review

#### Key Sessional Dates:

Classes begin: September 4, 2025

Fall Reading Week: November 3 – 9, 2025

Classes end: December 9, 2025

Exam period: December 11 – 22, 2025

### 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
- Online material

**Use of Personal Response Systems (“Clickers”):** This course will occasionally use virtual clickers (accessible via laptop, tablet, or smartphone) for in-class participation, polls, and quizzes. Students are expected to bring an internet-enabled device to class to participate.

**Use of Kritik:** This course will use Kritik, an online peer assessment platform, for reviewing assignments and project deliverables. Students will be required to submit their work, evaluate peers’ submissions, and provide constructive feedback through the platform. Access to Kritik is via a web browser on a laptop, tablet, or smartphone. A course-specific sign-up link will be provided on the OWL course site at the start of term.

All course material will be posted to OWL: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL site (<https://westernu.brightspace.com/>) regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL site, they can seek support on the [OWL Brightspace 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

### Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

- |                |                                  |
|----------------|----------------------------------|
| - Assignments  | 15% (three assignments, 5% each) |
| - Midterm test | 20%                              |
| - Final exam   | 30%                              |
| - Project      | 35%                              |

### Tentative list of assessments and dates:

- Assignment 1: Data storage and indexing (Available: Sep 11, Submission deadline: Sep 25, Peer review: Sep 30 – Oct 7)
- Assignment 2: Query answering and optimization (Available: Oct 30, Submission deadline: Nov 13, Peer review: Nov 18 – Nov 25)
- Assignment 3: Transaction management and crash recovery (Available: Nov 13, Submission deadline: Nov 27, Peer review: Dec 2 – Dec 9)
- Midterm exam: Weeks 1–6 (Oct 21, 12:30–2:30 pm, in class)
- Project: Submission deadline: Dec 6, 11:55 pm (Optional peer review: Dec 9 – Dec 20)
- Final exam: Weeks 1–13 (date and time: TBD)

### General information about missed coursework

Students must familiarize themselves with the *University Policy on Academic Consideration – Undergraduate Students in First Entry Programs*, posted on the Academic Calendar:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/academic\\_consideration\\_Sep24.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf),

This policy does not apply to requests for Academic Consideration submitted for **attempted or completed work**, whether online or in person.

The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult [Accessible Education](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage:

[https://registrar.uwo.ca/academics/academic\\_considerations/](https://registrar.uwo.ca/academics/academic_considerations/)

All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

All Academic Consideration requests must include supporting documentation; however, recognizing that formal documentation may not be available in some extenuating circumstances, the policy allows students to make one Academic Consideration request **without supporting documentation** in this course. However, the following assessments are excluded from this, and therefore always require formal supporting documentation:

- Midterm test
- Final exam

When a student *mistakenly* submits their one allowed Academic Consideration request **without supporting documentation** for the assessments listed above or those in the **Coursework with Assessment Flexibility** section below, the request cannot be recalled and reapplied. This privilege is forfeited.

### **Evaluation Scheme for Missed Assessments**

One missed assignment may be approved without formal Academic Consideration. Any additional missed assignments require approved Academic Consideration. Extensions may be granted; however, once the model answer is posted, no further submissions will be accepted. In such cases, the final exam will be reweighted to cover the missed mark. If the midterm test is missed with approved Academic Consideration, the weight will be reallocated to the final exam. Opportunities will be provided to complete missed project components within a reasonable timeframe.

When a student misses the Final Exam and their Academic Consideration has been granted, they will be allowed to write the Special Examination (the name given by the University to a makeup Final Exam). See the Academic Calendar for details (under [Special Examinations](#)), especially for those who miss multiple final exams within one examination period.

### **Essential Learning Requirements**

Even when Academic Considerations are granted for missed coursework, students cannot pass this course without completing the course project and writing the final exam (or its approved make-up), and achieving at least 50% of the total course mark. These are essential learning requirements to demonstrate sufficient mastery of the course outcomes. Failure to meet any of these requirements will result in a failing grade, regardless of performance in other components.

### **Coursework with Assessment Flexibility**

All assignments must be submitted by the stated deadlines. Late submissions will incur a penalty of **20% per day**, including weekends. Assignments will not be accepted once the model answer is posted

or peer review has taken place; in such cases, the final exam will be reweighted to cover the missed mark.

## 6. Additional Statements

### 6.1 Religious Accommodation

When conflicts arise with a religious holiday that requires an absence from the University or prohibits certain activities, students should request an accommodation for their absence in writing to the course instructor and/or the Academic Advising office of their Faculty of Registration. This notice should be made as early as possible, but not later than two weeks prior to the writing of the examination (or one week prior to the writing of the test).

Please visit the Diversity Calendars posted on our university's EDID website for the recognized religious holidays - <https://www.edi.uwo.ca>

### 6.2 Academic 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](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf).

### 6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

**Use of @uwo.ca email:** In accordance with policy, [https://www.uwo.ca/univsec/pdf/policies\\_procedures/section1/mapp113.pdf](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 email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

**Requests for Relief** (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/requests\\_for\\_relief\\_from\\_academic\\_decisions.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf)

Procedures on Request for Relief from Academic Decision (Undergraduate):

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/undergrad\\_requests\\_for\\_relief\\_procedure.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf)

Procedures on Request for Relief from Academic Decision (Graduate):

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/graduate\\_requests\\_for\\_relief\\_procedure.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/graduate_requests_for_relief_procedure.pdf)

### 6.4 Scholastic Offences

Policy on Scholastic Offences:

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/scholastic\\_offences.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf)

Procedures on Scholastic Offences (Undergraduate):

[https://uwo.ca/univsec/pdf/academic\\_policies/appeals/undergrad\\_scholastic\\_offence\\_procedure.pdf](https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf)

Procedures on Scholastic Offences (Graduate):

### Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the possession of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, and wireless earbuds or headphones.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at your desk, on your person, or within reach during an assessment will be treated as a *scholastic offence*, even if the device is not in use.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is your responsibility to review and comply with these expectations.

### Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is your responsibility to seek clarification before using any AI tools in academic work.

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.

## 6.5 Support Services

Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, 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](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](mailto: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. If you have any questions regarding accommodations, you may also wish to contact Accessible Education at

[http://academicsupport.uwo.ca/accessible\\_education/index.html](http://academicsupport.uwo.ca/accessible_education/index.html)

Learning-skills counsellors at Learning Development and Success (<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/>.