



# THE UNIVERSITY OF WINNIPEG

## APPLIED COMPUTER SCIENCE

**Course Number:** ACS-4902-001 / GACS-4902-001  
**Course Name:** Advanced Database Systems  
**Course Webpage:** Nexus (<https://nexus.uwinnipeg.ca/d2l/home/33736>)

### Instructor Information

**Instructor:** Dr. Mary Adedayo  
**E-mail:** [m.adedayo@uwinnipeg.ca](mailto:m.adedayo@uwinnipeg.ca)  
**Office Hours:** Wednesdays 11:30 – 12:30 pm via Zoom  
**Class meeting time:** Tuesdays/Thursdays 11:30 – 12:45 pm via Zoom/Online

### Important Dates

- |   |                            |
|---|----------------------------|
| 1. First Class:                                 | Thursday, January 7, 2021  |
| 2. Reading Week (no classes):                   | February 14 – 20, 2021     |
| 3. Midterm Exam:                                | Tuesday, February 23, 2021 |
| 4. Final Withdrawal Date w/o academic penalty*: | Tuesday, March 16, 2021    |
| 5. Last Class:                                  | Tuesday, April 6, 2021     |
| 6. Final Exam (Comprehensive):                  | <i>TBD</i>                 |
| 7. University closures: Louis Riel Day          | Monday, February 15, 2021  |
| Good Friday                                     | Friday, April 2, 2021      |

\*A minimum of 20% of the work on which the final grade is based will be evaluated and available to the student before the voluntary withdrawal date.

### Course Objectives / Learning Outcomes

This course is a continuation of ACS-3902 (Database Systems). It deals with advanced topics in database design, use, and administration.

Concretely, the knowledge of the following topics will be established:

1. System implementation and client/server architectures
2. Query processing and optimization
3. Transaction processing, concurrency control and recovery
4. Database security
5. Enhanced entity-relationship modelling

## 6. Object-oriented database management systems

### **Remote Learning**

Lectures will be a combination of live and pre-recorded sessions. Days on which there will be no live lectures will be announced and the pre-recording will be available on Nexus. Students must be available via Zoom during all lecture times. **Live sessions are not recorded.**

All course material including lecture notes/slides and pre-recorded videos, assignments and any other details will be available on Nexus. Class times are reserved and could be used for lectures, discussions, Q&A, or office hours, as necessary.

For all Zoom interactions:

- Students must display their real/full name.
- Use of Video is optional (except for tests and the final exam).
- Participants must be muted when not speaking.
- Students may interact via chat, voice, or gestures.

Students can find answers to frequently asked questions related to remote learning here: <https://www.uwinnipeg.ca/covid-19/remote-learning-faq.html>.

*Note: A permitted or necessary change in mode of delivery may require adjustments to important aspects of course outlines, like class schedule and the number, nature, and weighting of assignments and/or exams.*

### **Evaluation Criteria**

#### 1. Assignments (28%)

- 4 assignments, equally weighted.
- Due dates will be posted on Nexus.
- Assignments will be accepted up to 1 day late with a 25% penalty.

Course tools:

Some part of the course may require minimal use of PostgreSQL or Oracle. PostgreSQL is free to download to your own computing environments (see <https://www.postgresql.org>). And a live version of Oracle (<https://livesql.oracle.com>) may be used where required.

Assignment submissions:

All work is to be submitted electronically via Nexus. The requirement for programming questions will be stated in each assignment. Non-programming questions must be typed using a word processor or drawing software and submitted as a PDF (Portable Document Format) file. Further details and submission procedure will be stated in each assignment.

Students are responsible for backing up and protecting their assignment work, and for reviewing their assignments before submission to ensure the correct files are submitted.

2. Midterm Tests (27%)
  - During the regular class time (See important dates)
3. Final Exam (45%)
  - Cumulative
  - Date – **TBD**

*Students should contact the instructor as soon as possible* if extenuating circumstances require missing a lab, assignment, test, or examination. A medical certificate from a practicing physician may be required before any adjustments are considered.

### **Test / Exam Requirements**

- Photo ID is required for the midterm and final exams.
- Midterm and final exams will be delivered via Nexus. Students must have video capability and be prepared to present their student ID.
- Midterm and final exams are open book.
  - Students are permitted to view only the following authorized course material:
    - Class notes, slides, recordings, sample code or database file, assignment descriptions and solutions posted by the instructor.
    - Course textbook.
    - Student's own course notes and assignment submissions.
  - Students may use an external tool such as a text editor or diagramming tool to answer questions before entering them into the exam.
  - Students may contact the instructor to ask questions.
  - External resources (or any material not listed above) are NOT PERMITTED.
  - Communication with others (except the instructor) is NOT PERMITTED.
  - All work must be entirely the students' own. Collaboration or sharing of work is NOT PERMITTED.

Students with documented disabilities, temporary or chronic medical conditions, requiring academic accommodations for tests/exams (e.g., private space) or during lectures/laboratories (e.g., note-takers) are encouraged to contact Accessibility Services (AS) at 204-786-9771 or [accessibilityservices@uwinnipeg.ca](mailto:accessibilityservices@uwinnipeg.ca) to discuss appropriate options. All information about a student's disability or medical condition remains confidential.  
<https://www.uwinnipeg.ca/accessibility-services>.

Students may choose not to attend classes or write examinations on holy days of their religion, but they must notify their instructors at least two weeks in advance. Instructors will then provide opportunity for students to make up work examinations without penalty. A list of religious holidays can be found in the 2019-20 Undergraduate Academic Calendar online at <http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf>

## **Final Letter Grade Assignment**

Historically, numerical percentages have been converted to letter grades using the following scale. However, instructors can deviate from these values based on pedagogical nuances of a particular class, and final grades are subject to approval by the Department Review Committee.

|    |           |    |          |   |           |
|----|-----------|----|----------|---|-----------|
| A+ | 90 – 100% | B+ | 75 – 79% | C | 60 – 64%  |
| A  | 85 – 89 % | B  | 70 – 74% | D | 50 – 59%  |
| A- | 80 – 84%  | C+ | 65 – 69% | F | below 50% |

## **Required Textbook / Reading List**

- Elmasri and Navathe, *Fundamental of Database Systems, 7<sup>th</sup> Edition*, Addison-Wesley, ISBN: 978-0-133970777
- Class notes/slides will be available on Nexus.

## **Prerequisite Information**

- A grade of at least C in both ACS-2947(3) and ACS-3902(3)
- Students that have taken ACS-4902 are not eligible to take GACS-4902.

## **Regulations, Policies, and Academic Integrity**

Academic dishonesty is a very serious offense and will be dealt in accordance with the University's policies.

*Avoiding Academic Misconduct:* Students are encouraged to familiarize themselves with the Academic Regulations and Policies found in the University Academic Calendar at:

<https://uwinnipeg.ca/academics/calendar/docs/regulationsandpolicies.pdf>

Particular attention should be given to subsections 8 (Student Discipline), 9 (Senate Appeals) and 10 (Grade Appeals). Please note, in particular, the subsection of Student Discipline pertaining to plagiarism and other forms of cheating.

Detailed information can be found at the following:

- Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/policies/academic-misconduct-procedures.pdf>
- UW Library video tutorial "Avoiding Plagiarism" <https://www.youtube.com/watch?v=UvFdxRU9a8g>

Uploading essays and other assignments to essay vendor or trader sites (filesharing sites that are known providers of essays for use by others who submit them to instructors as their own work) involves “aiding and abetting” plagiarism. Students who do this can be charged with Academic Misconduct.

*Non-academic misconduct:* Students are expected to conduct themselves in a respectful manner on campus and in the learning environment irrespective of platform being used. Behaviour, communication, or acts that are inconsistent with a number of UW policies could be considered “non-academic” misconduct. More detailed information can be found here:

- Respectful Working and Learning Environment Policy  
<https://www.uwinnipeg.ca/respect/respect-policy.html>,
- Acceptable Use of Information Technology Policy  
<https://www.uwinnipeg.ca/institutional-analysis/docs/policies/acceptable-use-of-information-technology-policy.pdf>
- Non-Academic Misconduct Policy and Procedures: <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-policy.pdf> and <https://www.uwinnipeg.ca/institutional-analysis/docs/student-non-academic-misconduct-procedures.pdf>.

*Copyright and Intellectual Property:* Course materials are the property of the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides—irrespective of format. Students who upload these materials to filesharing sites, or in any other way share these materials with others outside the class without prior permission of the instructor/presenter, are in violation of copyright law and University policy. Students must also seek prior permission of the instructor/presenter before, for example, photographing, recording, or taking screenshots of slides, presentations, lectures, and notes on the board. Students found to be in violation of an instructor’s intellectual property rights could face serious consequences pursuant to the Academic Misconduct or Non-Academic Misconduct Policy; such consequences could possibly involve legal sanction under the Copyright Policy

[https://copyright.uwinnipeg.ca/docs/copyright\\_policy\\_2017.pdf](https://copyright.uwinnipeg.ca/docs/copyright_policy_2017.pdf)

## **Privacy**

Students have rights in relation of the collecting of personal data the University of Winnipeg:  
<https://www.uwinnipeg.ca/privacy/admissions-privacy-notice.html>.

More information:

- Zoom and Privacy: <https://www.uwinnipeg.ca/privacy/zoom-privacy-notice.html>
- Testing/Proctoring: <https://www.uwinnipeg.ca/privacy/zoom-test-and-exam-proctoring.html>.

## **Email Communication**

Emails from accounts at uwinnipeg.ca are usually not filtered by the UofW email filter. Thereby it is strongly recommended that electronic communication is done using your UofW email account to minimize the risk of filtering.

When emailing the instructor, you must include your full name, your student number, and the course number (with section) in the subject line or body of your email. You are to use the UofW Webmail system, i.e. *webmail.uwinnipeg.ca* to communicate with the instructor. **Do not** use the Nexus email system, i.e. *mail.nexus.uwinnipeg.ca*, Nexus mailbox are not monitored on a regular basis.

## **Class Cancellation, Correspondence with Students and Withdrawing from Course**

When it is necessary to cancel a class due to exceptional circumstances, the course instructor will make every effort to inform students via uwinnipeg email and Nexus.

Students are reminded that they have a responsibility to regularly check their uwinnipeg e-mail addresses to ensure timely receipt of correspondence from the University and/or the course instructor.

Please let course instructor know if you plan on withdrawing from the course. Note that withdrawing before the VW date does not necessarily result in a fee refund.

## **Topics to be covered (tentative)**

- Chapter 2 Database System Concepts and Architecture
- Chapter 18 Strategies for Query Processing
- Chapter 19 Query Optimization
- Chapter 20 Introduction to Transaction Processing Concepts and Theory
- Chapter 21 Concurrency Control Techniques
- Chapter 22 Database Recovery Techniques
- Chapter 30 Database Security
- Chapter 9 ER- and EER-to-Relational Mapping
- Chapter 14 Functional Dependencies and Normalization
- Chapter 12 Object and Object-Relational Databases
- Chapter 10 Introduction to SQL Programming Techniques
- Chapter 13 XML: Extensible Markup Language

*\* Chapters 12, 10, and 13 will be covered as time permits*

