THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-3902-001
Course Name: **Database Systems**
Course Webpage: https://nexus.uwinnipeg.ca/d2l/home

Instructor Information

Instructor: Ron McFadyen
E-mail: r.mcfadyen@uwinnipeg.ca
Office Hours: Thursdays   10:00 am - 11:00 am   3D21
Class meeting time: Tuesdays/Thursdays   1:00 pm - 2:15 pm   3D01

Important Dates

1. First Class: Tuesday, September 5, 2023
2. Midterm Test 1:   Thursday, October 5, 2023
3. Reading Week (no classes):   October 8-14, 2023
4. Midterm Test 2:   Thursday, October 26, 2023
5. Final Withdrawal Date w/o academic penalty*:   Monday, November 13, 2023
6. Last Class: Thursday, November 30, 2023
7. Final Exam (Comprehensive):   TBD
8. University closures: Truth and Reconciliation Day   Saturday, September 30, 2023
                          Thanksgiving   Monday, October 9, 2023
                          Remembrance Day   Saturday, November 11, 2023

*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

- Introduce Relational and NoSQL models with emphasis on Relational.
- Provide the foundation for database design required by systems analysts, designers, programmers, and data modelers.
- Introduce techniques utilized in the various stages of a database software development cycle.
- EERDs, database languages, functional dependencies, normalization, physical data storage.

Evaluation Criteria

1. **Assignments**: 20%
   - All assignments are to be completed individually.
   - 4 assignments worth 5% each and due by midnight on due dates.
   - Late assignments are accepted, up to 1 day, with 20% off.
   - All work is to be submitted electronically via Nexus.
   - Programming questions may require .java, .js, .json, or .sql files.
   - Non-programming questions are answered using a word processor or drawing software and submitted as .pdf files or .txt files as may be required.
   - 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.

   Course tools:
   The database management system used in the course is PostgreSQL. It is expected that students use PostgreSQL for all assignments involving databases. PostgreSQL is free to download to your own computing environments (see https://www.postgresql.org).
   An EERD drawing tool is available (see
   https://www.acs.uwinnipeg.ca/rmcfadyen/CreativeCommons/index.htm)

2. **Midterm Tests** (Test 1 15%, Test 2 15%).
   During the regular class time (see Important Dates).

3. **Final Exam** (50%).
   Cumulative.
   - Date, time to be announced.

Test / Exam Requirements

- Photo ID is required for the final exam.
- The use of computers, calculators, phones, or other electronic devices is not permitted during exams.
- Midterm and final exams are closed-book.

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.

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 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 Text Book / Reading List

- Elmasri/Navathe, Fundamentals of Database Systems, 7th edition, Addison-Wesley, ISBN# 978-0-133970777
- Class Notes will be available on Nexus

Prerequisite Information

- ACS-2814 (or the former ACS-2914) with a minimum grade of C

Regulations, Policies, and Academic Integrity

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).

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

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
- About Academic Integrity and Misconduct, Resources and FAQs: https://library.uwinnipeg.ca/use-the-library/help-with-research/academic-integrity.html

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.

Academic Integrity and AI Text-generating Tools: Students must follow principles of academic integrity (e.g., honesty, respect, fairness, and responsibility) in their use of material obtained through AI text-generating tools (e.g., ChatGPT, Bing, Notion AI). If an instructor prohibits the use of AI tools in a course, students may face an allegation of academic misconduct if using them to do assignments. If AI tools are permitted, students must cite them. According to the MLA (https://style.mla.org/citing-generative-ai/), writers should
- cite a generative AI tool whenever you paraphrase, quote, or incorporate into your own work any content (whether text, image, data, or other) that was created by it
- acknowledge all functional uses of the tool (like editing your prose or translating words) in a note, your text, or another suitable location
- take care to vet the secondary sources it cites

If students are not sure whether or not they can use AI tools, they should ask their professors.

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/basics/copyright-policy.html

Privacy

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

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, order may vary)

1. Ch 5 The relational data model and relational database constraints
2. Ch 6 Basic SQL
3. Ch 7 More SQL: complex queries, triggers, views, and schema modification
4. Ch 8 The relational algebra
5. Ch 3 Data modeling using the entity-relationship (ER) model
6. Ch 4 The enhanced entity-relationship (EER) model
7. Ch 9 Relational database design by ER- and EER-to-relational mapping
8. Ch 14 Basics of functional dependencies & normalization
9. Ch 16, 17 file structures: hashing (linear hashing), indexing (B$^+$tree)
10. Ch 24 NOSQL Databases
11. As time permits: Introduction to Data Warehousing and Conceptual Modeling

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.