THE UNIVERSITY OF WINNIPEG

APPLIED COMPUTER SCIENCE

Course Number: ACS-3902-002
Course Name: Database Systems
Course Webpage: https://nexus.uwinnipeg.ca/d2l/home/67982

Instructor Information

Instructor: Claudio Sousa
E-mail: cl.sousa@uwinnipeg.ca

Office Hours:	Wednesday	5:00 – 6:00 pm, 3C07
	Saturdays (by appointment)	9:00 – 10:00 am, via Zoom
Class meeting time:	Tues / Thurs	2:30 – 3:45 pm, 3D01

Important Dates

1. First Class:		Tuesday, January 7, 2025
2. Reading Week (no classes):		February 16-22, 2025
3. Term Test 1:		Tuesday, February 11, 2025
4. Final Withdrawal Date w/o academic penalty*:		Friday, March 14, 2025
5. Term Test 2:		Tuesday, March 18, 2025
6. Last Class:		Thursday, April 3, 2025
7. Final Exam:		*TBD*
8. Final Exam Period:		April 9-23, 2025
9. University closures:	Louis Riel Day	Monday, February 17, 2025
	Good Friday	Friday, April 18, 2025

*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 and implementation 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%**
   - 4 assignments worth 5% each and due by midnight on due dates.
   - All assignments are to be completed individually unless otherwise noted.
   - Late assignments may be subject to a late penalty of 25%. Assignments submitted later than 48 hours after the deadline will not be accepted.
   - All work is to be submitted electronically via Nexus in the format prescribed within the assignment instructions.
   - Students are responsible for backing up and protecting their assignment work, and for reviewing their assignments before and after submission to ensure the correct files are submitted. Allowances for technical issues, loss of data, or submission errors will not be considered.

2. **Midterm Tests: 30%**
   - Midterm Test #1: 15%
   - Midterm Test #2: 15% (non-cumulative)

3. **Final Exam: 50%**
   - The final exam is cumulative. The date and time of the final exam will be announced by the University during the term.

Course Tools

- **PostgreSQL**
  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).
- **Postgres Admin (Pg Admin)**
  A SQL editor suitable for interacting and working with PostgreSQL. This edition is free and can be downloaded and installed on your own computing environment: https://www.pgadmin.org
- **Enhanced Entity Relationship Modeling Tool**
  An EERD drawing tool is available from Dr. McFadyen's content on the ACS website. https://www.acs.uwinnipeg.ca/rmcfadyen/CreativeCommons/index.htm
- **Lucidchart: General Diagramming Tool**
  Used for information engineering notation and other diagramming as needed. Signup using your @uwinnipeg.ca address for a free academic license at https://www.lucidchart.com

Test / Exam Requirements

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

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

Accessibility Accommodations

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 2024-25 Undergraduate Academic Calendar online at http://uwinnipeg.ca/academics/calendar/docs/important-notes.pdf. Extensions for assignments will not be granted to accommodate holy days except in cases where the due date falls on the holy day itself. In this case a suitable due date will be applied.

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/policies/docs/policies/academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/policies/docs/procedures/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 course work 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: Use of AI Tools is prohibited in this course: students may face an allegation of academic misconduct if using them to do assignments.

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/policies/docs/policies/acceptable-use-of-information-technology-policy.pdf
- Non-Academic Misconduct Policy and Procedures: https://www.uwinnipeg.ca/policies/docs/policies/student-non-academic-misconduct-policy.pdf and https://www.uwinnipeg.ca/policies/docs/procedures/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 the 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)

The order and timing of these topics may change as the term progresses. The relevant chapters of the accompanying text are identified with each topic to assist students with companion reading to the lecture material.

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 3 Data modeling using the entity-relationship (ER) model and Information Engineering Notation
5. Ch 4 The enhanced entity-relationship (EER) model and Using Information Engineering Notation
6. Ch 14 Database Normalization
7. Ch 9 Relational database design by ER- and EER-to-relational mapping
8. Ch 8 The relational algebra
9. Ch 16 & 17 Understanding indexes and file structures: hashing (linear hashing), indexing (B_+ tree)
10. Ch 24 NOSQL Databases
11. As time permits: Introduction to Data Warehousing and Dimensional 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.