



# THE UNIVERSITY OF WINNIPEG

## APPLIED COMPUTER SCIENCE

**Course Number:** ACS-3902-001

**Course Name:** Database Systems

**Course Webpage:** <http://courses.acs.uwinnipeg.ca/3902-001/>

### Instructor Information

**Instructor:** Ron McFadyen

**E-mail:** [r.mcfadyen@acs.uwinnipeg.ca](mailto:r.mcfadyen@acs.uwinnipeg.ca)

**Office Hours:** Thursday 10:00 – 11:00 am **Office:** 3D21

**Class meeting time:** Tuesday/Thursday 1:00 – 2:15 pm **Room:** 3D01

### Important Dates

- |   |                             |
|---|-----------------------------|
| 1. First Class:                                 | Tuesday, September 3, 2019  |
| 2. Midterm Test 1:                              | Thursday, October 3         |
| 3. Reading Week (no classes):                   | October 13-19, 2019         |
| 4. Midterm Test 2:                              | Thursday, November 7, 2019  |
| 5. Final Withdrawal Date w/o academic penalty*: | Tuesday, November 12, 2019  |
| 6. Last Class:                                  | Thursday, November 28, 2019 |
| 7. Final Exam (Comprehensive):                  | Thursday, December 5, 2019  |
| 8. University closures: Thanksgiving            | Monday, October 14, 2019    |
| Remembrance Day                                 | Monday, November 11, 2019   |

\*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 theory of relational model.
- 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.
- Cover EERDs, database languages, functional dependencies, normalization, physical data storage.

## **Evaluation Criteria**

- Assignments: 25%
  - All assignments are to be completed individually
  - There will be 5 assignments worth 5% each
  - Due by midnight on due dates
  - Late assignments are accepted, up to 1 day, with 20% off
  - Assignments typically involve programming and are submitted via email
  - Multiple submissions are permitted. Students may submit a partially completed assignment, and will receive credit for those attempted problems
  - Students are responsible to review their assignments before submission to make sure the correct files are attached to the email
  - As required, \*.java, \*.js, \*.json, or \*.sql files must be submitted for programming questions. Non-programming questions must be typed using a word processor or drawing software and submitted as a PDF file (Portable Document Format). The details of submission procedure will be stated in each assignment
- Midterm Tests: 25%
  - During regular class time on October 3 (10%) and November 7 (15%)
- Final Exam: 50%
  - Cumulative, 3 hours duration

*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 final exam.
- The use of computers, calculators, phones, or other electronic devices is not permitted on exams.
- Midterm and final exams are closed book.

## **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 and notices will be available from the course web site.

Database systems used in class are available in ACS laboratories.

## **Prerequisite Information**

- A grade of at least C in ACS-2913(3) (or the previous ACS-2911(3) and ACS-2912(3)) and ACS-2814(3) (or the former ACS-2914(3))

## **Services for Students**

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>

All students, faculty and staff have the right to participate, learn, and work in an environment that is free of harassment and discrimination. The UW Respectful Working and Learning Environment Policy may be found online at <https://www.uwinnipeg.ca/respect>.

## **Misuse of Computer Facilities, Plagiarism, and Cheating**

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

*Avoiding Academic Misconduct and Non-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>
- 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>

*Misuse of Filesharing Sites.* 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.

*Avoiding Copyright Violation.* Course materials are owned by the instructor who developed them. Examples of such materials are course outlines, assignment descriptions, lecture notes, test questions, and presentation slides. 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 photographing or recording slides, presentations, lectures, and notes on the board.

### **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/or using the preferred form of communication, as designated in this outline), as well as the Departmental Assistant and Chair/Dean so that class cancellation forms can be posted outside classrooms.

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)**

Ch 5 The relational data model and relational database constraints

Ch 6 Basic SQL

Ch 7 More SQL: complex queries, triggers, views, and schema modification

Ch 8 The relational algebra

Ch 3 Data modeling using the entity-relationship (ER) model

Ch 4 The enhanced entity-relationship (EER) model.

Ch 9 Relational database design by ER- and EER-to-relational mapping

Ch 14 Basics of functional dependencies & normalization

Ch 16, 17 file structures: hashing, indexing

As time permits: NOSQL Databases (MongoDB), Data warehousing, Object and object-relational databases, XML, Hierarchical data model