

Carleton University
School of Computer Science
COMP 4900B/5305W
Advanced Database Systems
Winter 2024

Instructor: Mengchi Liu, mengchi@scs.carleton.ca

Lectures: Monday: 11:35AM - 2:55PM

Office Hours: Thursday: 4:00PM – 5:00PM

Teaching Assistants: Pooja Patel, PoojaKPatel@cmail.carleton.ca

Course Description:

The database field has experienced rapid and incessant growth since the development of the relational databases. The progress in database systems and applications has produced a diverse landscape of specialized technology areas that have often become the exclusive domain of research specialists. This course provides a systematic introduction to and an in-depth study of several important developments in database systems, especially

1. Nested relational databases
2. Object-oriented database
3. Object-relational databases
4. XML databases
5. INM databases
6. NoSQL databases

Prerequisites:

An introductory course on database systems

Course Information

We use [brightspace](#) to host information about the course such as announcements, lecture slides, TAs' office hours, discussion forums, posting and submitting assignments, grading, and classroom. For University of Ottawa Students, please visit the following site for details: <https://gradstudents.carleton.ca/faculty-of-graduate-and-postdoctoral-affairs-access-to-brightspace/>

For information about Carleton's academic year, including registration and withdrawal dates, see [Carleton's Academic Calendar](#).

Textbooks:

1. Complex Value Databases

Foundations of Databases, S. Abiteboul, R. Hull, and V. Vianu, Addison-Wesley, 1995.
Chapter 20 ([Available online](#))

2. Object-Oriented Databases

Building an Object-Oriented Database System: The Story of O₂, Francois Bancilhon, Claude Delobel, and Paris Kanellakis, Morgan Kaufmann, 1992.

Object-Oriented Database Management, A. Kemper and G. Moerkotte, Prentice Hall, 1994.

Object Database Standard ODMG 3.0, R.G.G. Cattell, et al., Morgan Kaufmann, 2000. (Available online)

3. **XML databases**

An Introduction to XML and Web Technologies

Anders Moller and Michael Schwartzbach Addison-Wesley, 2006.

XQuery

Priscilla Walmsley, O'Reilly, 2007.

4. **NoSQL databases**

Next Generation Databases: NoSQL, NewSQL, and Big Data

Guy Harrison, Apress, 2015. (Available online)

Assessment Scheme:

Best 4 out of 5 Assignments.	20%
Midterm (Feb 26)	30%
Project	50%

Notes:

1. Collaborating on assignments is strictly disallowed. If found, all students involved will be given a mark of 0 and the case will be reported to the office of the Dean of Science.
2. If you need help, please see TAs and/or the instructor during their office hours.
3. Posting assignment solutions on discussion boards before the due date is prohibited and the student involved will be given a mark of 0 for the assignment.
4. Assignments must be submitted electronically to Brightspace. Make sure your submitted file can be **opened** and is **correct**. There is no "grace period" with respect to the deadline. Late assignments are **never accepted** for any reason. Never email any assignment to the TA or the instructor! Technical problems do not exempt you from this requirement, so if you wait until the last minute and then have issues with your connection, you will still receive a mark of zero. Consequently, you are advised to:
 - Periodically upload your progress.
 - Attempt to submit your final submission at least **one hour** before it is due.
5. No Self-Declaration Forms will be accepted for missed course work.
6. Any issues regarding assignments and midterm should be brought to the attention of the TA who marked it. Only if the TA does not address the problem to your satisfaction, then you bring the matter to the instructor. This should be done **no later than two weeks** after this assignment/midterm is marked. After this time, no remarking will be done.
7. For the midterm, e-Proctoring provided by Scheduling and Examination Services will be used and requires the use of webcams, microphones, and smartphones and the installation of CoMaS.
8. You **must pass** the midterm exam to pass the course.

Important note for University of Ottawa students after registration:

Brightspace access for University of Ottawa Students: please visit

<https://gradstudents.carleton.ca/faculty-of-graduate-and-postdoctoral-affairs-access-to-brightspace/>

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Undergraduate Academic Advisors

The Undergraduate Advisors for the School of Computer Science are available in room HP5302; or by email at scs.ug.advisor@cunet.carleton.ca. The undergraduate advisors can assist with information about prerequisites and preclusions, course substitutions/equivalencies, understanding your academic audit, and the remaining requirements for graduation. The undergraduate advisors will also refer students to appropriate resources such as the Science Student Success Centre, Learning Support Services, and Writing Tutorial Services.

Graduate Academic Advisors

The Graduate Advisors for the School of Computer Science are available in room HP5302; or by email at grad.scs@carleton.ca. The graduate advisors can assist with understanding your academic audit and the remaining courses required to meet graduation requirements.

SCS Computer Laboratory

Students taking a COMP course can access the SCS computer labs. The lab schedule and location can be found at <https://carleton.ca/scs/tech-support/computer-laboratories/>. All SCS computer lab and technical support information can be found at: <https://carleton.ca/scs/tech-support/>. Technical support staff may be contacted in person or virtually. For details, visit <https://carleton.ca/scs/tech-support/contact-it-support/>.

University Policy

Academic Accommodations

Carleton is committed to providing academic accessibility for all individuals. Please review the academic accommodation available to students at <https://students.carleton.ca/course-outline/>.

Academic Integrity

Student Academic Integrity Policy. Every student should be familiar with the Carleton University Student Academic Integrity policy. A student found in violation of academic integrity standards may be sanctioned with penalties which range from a reprimand to receiving a grade of F in the course, or even being suspended or expelled from the University. Examples of punishable offenses include plagiarism and unauthorized collaboration. Any such reported offenses will be reviewed by the office of the Dean of Science. For more information on this policy, visit <https://carleton.ca/registrar/academic-integrity/>.

Plagiarism. As defined by Senate, "plagiarism is presenting, whether intentional or not, the ideas, expression of ideas or work of others as one's own". Such reported offenses will be reviewed by the office of the Dean of Science. For more information and standard sanction guidelines, visit <https://science.carleton.ca/students/academic-integrity/>.

Unauthorized Collaboration. Senate policy states that "to ensure fairness and equity in assessment of term work, students shall not co-operate or collaborate in the completion of an

academic assignment, in whole or in part, when the instructor has indicated that the assignment is to be **completed on an individual basis**".

The following are some examples of things you can or cannot do:

- You are not allowed to copy or edit any portion of another student's work such as code, diagram, etc, nor from any websites, but you may use those from the course notes.
- You are not allowed to give your solution (or any portions of it) to another student.
- You are not allowed to work on your assignment with other students, with friends, with parents, with relatives, etc.
- You are not allowed to post full or partial assignment solutions on discussion boards or websites such as Facebook, etc.

You must work on every assignment on your own without collaboration with other students. If you need help, see a TA or the instructor. Your assignment will be compared with others in the course and if you are believed to be involved in a plagiarism case in any way, the offense will be sent to the office of the Dean.