Course Syllabus

Course title: Database Systems Management
Class section: ICS **-** 212 **-** X03A
Term: 2025F
Course credits: 3
Total hours: 75
Delivery method: In-Person

Territorial acknowledgment

Camosun College respectfully acknowledges that our campuses are situated on the territories of the Lək̓ʷəŋən (Songhees and Kosapsum) and W̱SÁNEĆ peoples. We honour their knowledge and welcome to all students who seek education here.

Instructor details

Name: Brandon Devnich
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Course description

Course Description:
Learn to manage powerful database systems using advanced techniques in architecture, optimization, and data handling. You will tackle real-world challenges in creating and maintaining databases that securely store, manage, and retrieve data. You will expand knowledge in managing relational

databases and data warehousing, gaining the skills needed to build efficient, high-performance systems used across various industries.

Prerequisites:
One of:

C in COMP 139

C in ICS 124

C in COMP 146

And one of:

C in COMP 144

C in ICS 120

And one of:

C in ENGR 155

C in ICS 125

Co-requisites:
Pre or Co-requisites:
Equivalencies:

Learning outcomes

Upon successful completion of this course, the learner will be able to

1. Describe key data modelling concepts and schemas, including normalization and relationships
2. Apply database client programs proficiently to query and manage databases
3. Design, alter, and manage database objects (tables, indexes, views, etc.), considering various storage engines and table types
4. Differentiate between relational database and data warehouse modeling concepts, highlighting their use cases and structures
5. Identify the key requirements, components, and lifecycle of a data warehousing project, from planning to implementation

6. Analyze advanced concepts in database management, including performance optimization, indexing, and transaction management
7. Ensure data integrity by utilizing constraints, validation, and transaction management within database systems
8. Apply privacy standards to ensure data storage and processing comply with relevant laws and regulations
9. Implement security measures in database systems to protect sensitive data from unauthorized access.

Course materials

- Materials on the D2L course page: presentation slides for lectures, lab assignment instructions for labs, etc.
- Required Textbooks:
    - No required textbook.
- Recommended Hardware
    - This course assigns labs on a weekly basis that will enable students to gain practical experience using the Oracle DBMS and the MongoDB NoSQL database. Students will have access to a Linux Virtual Machine running Oracle and MongoDB that they can access from a school computer. However, it is recommended that students have access to computers capable of running these systems remotely. Recommended computer is a Windows 10/11 desktop or laptop with 8GB RAM and 12GB of free disk space.

Course schedule

General Schedule
The course will meet in-person, four times per week over a 14-week semester. Each week will consist of three one-hour lectures and one two-hour lab. Additional time over and above the allotted lab time may be required to complete lab assignments.

Lectures will be delivered in-person at regular times. Recordings of lectures may be made available.
Labs will be assigned and then due before the next scheduled lab block.

Please see lecture and lab schedule at http://my.camosun.ca for detailed information about class hours and locations. Please consult the calendar tool in D2L frequently for any updates.

Topics
This course will be use the Team Based Learning (TBL) learning model. Each week's lectures will focus on a single concept that will support your completion of the weekly lab. These topics will teach you the fundamentals of database systems management, using both relational and document-based database systems. Please see course schedule and topics table below for more detail.

The term will be broken into four modules, each spanning 3-4 weeks.

Activities
Prep
You will be expected to complete each week's preparation prior to the first lecture of the week. Preparation may include watching videos, reading online guides, or doing research on the web. Prep should take, on average, an hour per week, but may be more in the first week of a module.

Lectures
During lectures, you will be expected to participate in in-class individual and team exercises. Successful completion of the course requires regular attendance.

Readiness Assurance Tests
There will be individual (iRAT) and team (tRAT) readiness assurance tests conducted in the first lecture of the module.

4S Application Challenges
Every module contains 9-18 team application activities that follows the 4S model:

1. Significant Problem: Teams are presented with a significant problem.
2. Same Problem: All teams get the same scenario.
3. Specific Choice: Choose an option and defend it.
4. Simultaneous Report: All teams show their decision at the same time, then debate.

There will be 60 different scenarios that will test your and your team's knowledge. You will be graded, individually, on 20 of them.

Team Research Assignments (TRAs)
Each module will have 1-2 team-research assignments that are conducted during a lecture and are worth marks. Every team member is expected to participate in the research and presentation of the material. There are 7 TRAs planned.

Labs
You will be expected to attend all lab blocks as you will be required to demonstrate your completed lab assignment, due the night before, during the following lab block. Your instructor will provide you critiques and feedback which you will be required to implement before completing the next assignment. Your lab assignment will only be considered completed once those critiques have been implemented.

Midterm Exam

There will be a cognitive assessment conducted within the 7th week of the course. This exam will be conducted during the second lecture block of the week and will be a formative view on your understanding of concepts presented in the first six weeks of the course.

Final Exam

The final exam will be an open-book practical exam – this means that you will have access to course material (your own labs, lecture slides, handouts) as well as reference material found on the web. You will not be permitted to use AI.

Expected Workload

For highest results, you should expect to spend, outside of scheduled lecture and lab times, an additional 1-2 hours weekly to complete lab assignments, review material, and be prepared for the following week's topic.

Evaluation

While there is a minimum requirement of 65% on labs lab assignments (worth 30% of your grade), you will be encouraged (through feedback and instructor mentorship) to reach full completion before moving on to the following lab.

Weekly participation in iRATs and tRATs is required and is worth 10%, along with participation in weekly team 4S challenges and team research assignments worth 15%. You will be permitted to drop 4 of the lowest marks of the 27 the team exercises.

You will have a formative cognitive mid-term assessment worth 15% of your mark in the 7th week of the course, followed by a Practical Final exam worth 20%.

The final 10% of your mark will come from the Professionalism and Participation mark that will include self reflection and peer assessment.

Schedule of Sessions and Topics

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Week	Start	Topics	Labs
1	Sept 1	Course Introduction & Introduction to TBL	
2	Sept 9	MongoDB: Setup and CRUD	Lab 1: MongoDB CRUD
3	Sept 15	MongoDB: Security, Cursors & Scripts	Lab 2: MongoDB Security and Scripting
4	Sept 22	MongoDB: Indexing, Replication, Sharding	Lab 3: MongoDB Indexing & Scalability
5	Sept 28	Oracle: DDL, DML & Data Modeling Basics	Lab 4: Oracle Introduction / SQL Developer
6	Oct 6	Oracle: Schema Refactoring	Lab 5: Oracle Schema Creation & Data

			Manipulation
7	Oct 13	Review & Midterm	Lab 6: Oracle Schema Refactoring
8	Oct 20	Oracle: Triggers, Functions & Procedures	Lab 7: Oracle Triggers, Procedures, & Functions
9	Oct 27	Oracle: User Management, Roles & Privileges	Lab 8: Oracle User Roles & Access Control
10	Nov 3	Oracle: Indexing & Performance Tuning	Lab 9: Oracle Indexing & Query Optimization
11	Nov 10	Oracle: Backups, Recovery & DBA Tools	Lab 10: Oracle Backup & Recovery
12	Nov 17	Oracle: Import/Export & Migration	Lab 11: Oracle Import/Export & Migration
13	Nov 24	Oracle: Debugging, Ethics & Data Integrity	Lab 12: Oracle Debugging & Data Ethics
14	Dec 1	Final Review & Reflection	

Assessment and evaluation

Type	Description	Weight
Assignment	Lab Assignments Must achieve a 65% minimum average.	30
Assignment	Team Application Challenges In class 4S challenges and research assignments. Graded on participation, solution quality, and teamwork.	15
Quizzes and tests	iRAT + tRAT Quizzes Weekly readiness quizzes. 60% of the mark for iRAT, 40% of the mark for tRAT	10
Exams (Midterms and finals)	Midterm Exam Mix of multiple choice, short answer, and practical design/debugging.	15
Exams (Midterms and finals)	Final Exam Realistic and scenario based, SQL/Mongo queries, schema design, and data tasks.	20

Type	Description	Weight
Conduct Assessment	Professionalism & Participation Teamwork, attendance, effort, peer feedback, reflection writing.	10

Course guidelines and expectations

Late assignments and/or labs will not be accepted, except by the instructor's prior written permission or in the presence of a dire and documented short-term medical or family emergency. Student must complete **all** labs.

Students must, in order to pass the course, achieve:

- a minimum 65% on the final exam, and
- a minimum 65% on labs

Students must achieve a C (60%) in the course to use as a pre-requisite.

School or departmental information

Supplemental department policies:

Grade review: You have 7 days after marks are posted to review with your instructor.

Academic Integrity Violations:

- 1st violation: **minus the weight of the deliverable** and a note on your departmental file.
- 2nd violation: F in the course
- 3rd violation: Student Conduct Policy E-2.5 is applied

Missed Examinations/Quizzes: If a student misses a quiz, project or an exam, a mark of zero will be assigned unless there are extenuating circumstances. You must provide a note from a medical practitioner (Doctor, Nurse, Psychologist, Counsellor, etc.) In such cases, the proportion of grade assigned to the missed quiz or exam will be added to the proportion assigned to the final exam.

Electronic Devices: The school's policy regarding electronic devices is that any student who has a cell phone or other unauthorized electronic device (ie. ipad, laptop, playbook, etc.) on their person or around their desk during a closed-book exam will be guilty of cheating and will receive a grade of "F" for the course.

Academic integrity acknowledgement

When you registered you acknowledged the following:

> As a Camosun student, I understand that I am responsible for upholding the standards outlined in the Academic Integrity Policy, and commit to completing my coursework honestly, without cheating, plagiarizing, or getting unauthorized assistance.
> I will also follow my instructors' guidelines regarding the use of artificial intelligence (AI) tools in my academic work.
> I acknowledge that the Academic Integrity Policy explains the consequences of academic misconduct. These may include loss of marks, failing grades, or, in serious or repeated cases, suspension. If I violate the policy, my instructor may require me to complete a short online course on academic integrity.
> Camosun College offers resources to help me understand and uphold academic integrity. The Academic Integrity Online Guide provides real-life examples, tips for avoiding misconduct, and strategies for completing work with integrity.
> If I'm ever unsure about what constitutes plagiarism, cheating, or other forms of academic misconduct, I will ask my instructor for clarification.

It is your responsibility to uphold these academic integrity standards.

College policies and student responsibilities

The college expects students to be responsible, respectful members of the college community. Responsible students meet expectations about attendance, assignments, deadlines, and appointments. They become familiar with academic policies and regulations, and their rights and responsibilities.

College polices are available online at the Policies and Directives page. Academic regulations are detailed on the Academic Policies and Procedures for Students page.

Policies all students should be familiar with include the Academic Integrity Policy. This policy expects students to be honest and ethical in all aspects of their studies. It defines plagiarism, cheating, and other forms of academic dishonesty. Infractions of this policy can result in loss of marks or a failing grade. To learn more about plagiarism and cheating, including the use of artificial intelligence, review the Academic Integrity Guide.

The Academic Accommodations for Students with Disabilities Policy defines how Camosun provides appropriate and reasonable academic accommodations. The Centre for Accessible Learning (CAL) coordinates academic accommodations. Students requiring academic accommodations should request and arrange accommodations through CAL. Contact CAL at least one month before classes start to ensure accommodations can be put in place in time. Accommodations for quizzes, tests, and

exams must follow CAL's booking procedures and deadlines. More information is available on the CAL website.

Students must meet the grading and promotion standards to progress academically. More information is available in the Grading Policy.

The college uses two grading systems. A course will either use the standard letter grade system (A+ to F) or a competency-based approach with grades of complete, completed with distinction or not completed. Visit the Grades/GPA page for more information.

Students must meet the college's academic progress standards to continue their studies. A student is not meeting the standards of progress when a GPA falls below 2.0. The college offers academic supports for students at risk of not progressing. The Academic Progress Policy provides more details.

If you have a concern about a grade, contact your instructor as soon as possible. The process to request a review of grades is outlined in the Grade Review and Appeals Policy.

The Course Withdrawals Policy outlines the college's requirements for withdrawing from a course. Consult the current schedule of deadlines for fees, course drop dates, and tuition refunds.

If students experience a serious health or personal issue, they may be eligible for a medical or compassionate withdrawal. The Medical/Compassionate Withdrawal Request Form outlines what is required.

The Acceptable Technology Use policy ensures the use of the college network and computers contribute to a safe learning environment. This policy also applies to the use of personal devices with the college network.

Students experiencing sexual violence can get support from the Office of Student Support. This Office of Student support is a safe and private place to discuss supports and options. More information is available on the sexual violence support and education site. Students can email oss@camosun.ca or phone 250-370-3046 or 250-370-3841.

The Student Misconduct Policy outlines the college's expectations of conduct. Students should behave to contribute to a positive, supportive, and safe learning environment.

The Ombudsperson provides an impartial, independent service to help students understand college policies.

Services for students

Successful students seek help and access college services. These services are recommended to make the most of your time at college.

Services for Academic Success

- Career Lab: Connects students with work-integrated learning experiences, including co-op placements and career fairs.
- English, Math, and Science Help Centres: Get one-on-one help with homework.
- Library: Get help with research, borrow materials, and access e-journals and e-books. Libraries at both campuses provide computers, individual and group study spaces.
- Makerspace: A place to innovate, collaborate, and learn new skills and technology in a fun, dynamic, inclusive environment.
- Writing Centre & Learning Skills: Get assistance with academic writing or meet with a learning skills specialist for help with time management, preparing for exams, and study skills.

Enrolment, Registration, and Records

- Academic Advising: Talk to an academic advisor for help with program planning.
- Financial Aid and Awards: Learn about student loans, bursaries, awards, and scholarships.
- Registration: Get information about Camosun systems, including myCamosun, and college policies and procedures.
- Student Records: Get verification of enrolment to access funding, request a transcript, or credential.

Wellness and Cultural Supports

- Counselling: It's normal to feel overwhelmed or unsure of how to deal with life's challenges. The college's team of professional counsellors are available to support you to stay healthy. Counselling is free and available on both campuses. If you need urgent support after-hours, contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.
- Centre for Indigenous Education and Community Connections: Provides cultural and academic supports for Indigenous students.
- Camosun International: Provides cultural and academic supports for international students.
- Fitness and Recreation: Free fitness centres are located at both campuses.

For a complete list of college services, see the Student Services page.

Changes to this syllabus

Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change the course content or schedule. When changes

are necessary the instructor will give clear and timely notice.