The VIU community acknowledges and thanks the Snuneymuxw, Quw'utsun, Tla'amin, Snaw-naw-as and Qualicum First Nation on whose traditional lands we teach, learn, research, live and share knowledge.

Course Outline

CSCI 370 (3 credits) Database Systems
S26N01, S26N02

Calendar Description

An introduction to the use and operating principles of database management systems. Topics include data entities and relationships, data modelling using Entity-Relationship Diagrams, hierarchical, network and relational models of databases, query language, physical representation of data in secondary storage, relational algebra and calculus as applied to the design of databases, security and integrity in the context of concurrent use, and basic ethical issues associated with database design and use. (3:0:1)

Delivery Mode

Face-to-Face

Contact hours

Lectures: 10:00 – 11:30, Tuesdays and Thursdays, B200/R106
Labs: S26N01: 15:30 – 16:30, Tuesdays, B315/R115
        S26N02: 13:30 – 14:30, Thursdays, B315/R11

Instructor Info

Instructor name:	Huizhu Liu
Instructor VIU email address:	Huizhu.Liu@VIU.CA
Office Hours:	11:30 – 1:30, Tuesdays and Thursdays
	By appointment

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Computer Science | VIU

Prerequisites and Corequisites

Min. "C" in CSCI 260 and CSCI 265

Schedule

Dates	Topics	Lab	Assignments Quizzes	Project	Exams
Week 1	Introduction Data Models	-	-	-	-
Week 2	Relational DBMS Basics ER Modelling (I)	Lab 1	-	-	-
Week 3	Database design (II) SQL-1	Lab 2	A1	-	-
Week 4	SQL-2 Relational Algebra	Lab 3	A2	Prelimenary research	-
Week 5	Datalog SQL-3	Lab 4	A3	-	-
Week 6	SQL-4 Query Examples	Lab 5	A4	-	-
Week 7	Midterm Review In-class Midterm	Lab 6	A5	Proposal	Midterm
Week 8	Database Application (I) Database Application (II) (optional) Project Information	Lab 7	A6	-	-
Week 9	Functional Dependency Normal Forms	Lab 8	A7	-	-
Week 10	Transaction Management (Anomalies) Schedules	Lab 9	A8	Implementation	-
Week 11	Locks and Timestamps Recovery	work on project	A9	-	-
Week 12	Indexing Indexing	work on project	AA	Report	-
Week 13	Security Review	Lab A	-	Submit	-

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Learning Outcomes

Upon completing this course, students should be able to:
- Compare the different types of data models and describe the basic principles of the relational data model
- Map data domain knowledge to conceptual data model using semantic modeling tools such as ER diagram and translate conceptural model to concrete relational database schema
- Be familia with the query language of relational algebra, datalog (or tuple/domain calculus) and SQL
- Write correct and efficient SQL queries to retrieve, update, insert and delete data from relational database
- Develop a database application program per specification, and use the appropriate prepared and/or unprepared SQL statements to communicate with database server
- Determine the functional dependency between attributes and connect the constraints, such as super key, candidate key and primary key, with functional dependencies
- Properly design or transform the existing database schema to conform to BCNF and/or 3NF
- Explain the concept of concurrent transaction management and SQL isolation levels
- Select the appropriate scheduling protocols to guarantee the isolation level in transaction management
- Describe the process of database recovery
- Manage the database security using SQL control lanuage
- Explain the impact of efficient data accessing using indexing and the machanisms of the B+ tree indexing

Course Learning Materials

- Optional Textbook: Fundamentals of Database Systems, 5th Edition, by Elmasri/Navathe

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Evaluation and Assessment

- Assignments -- 30%
- Application Project -- 10%
- Midterm Exam -- 20%
- Final Exam -- 40%

All the course works must be done by students individually and independently.

In order to pass the course, your weighted exam average must be a passing mark.

Labs/Tutorials

You must be enrolled in, and *fully participate in*, the weekly tutorial/lab sessions.

Appeals of Grades:

Any exercise or examination grade may be appealed. However, the appeal must be made to the instructor, in writing and attached to the work in question, and within 7 days of the grade being made available to the class. The instructor reserves the right to re-grade the entire piece of work submitted on appeal, not necessarily just the component that the student believes is in error.

Grade Conversion:

The following grade scale will be used:

Percentage (%)	Letter Grade	Grade Point
90-100	A+	4.33
85-89	A	4.00
80-84	A-	3.67
76-79	B+	3.33
72-75	B	3.00
68-71	B-	2.67
64-67	C+	2.33
60-63	C	2.00
55-59	C-	1.67
50-54	D	1.00
0-49	F	0.00

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Resources

- [Instructor's Website](#)
- [VIU Learn](#)
- [Library](#)
- [Academic Advising](#)
- [Writing Centre](#)
- CSCI Help Centre
- [Math Learning Centre](#)
- [Services for Aboriginal Students](#)
- [Counseling Services](#)
- [Accessibility](#)
- [Registration](#)
- [VIU Students' Union](#)

Accessibility

Vancouver Island University recognizes its legal duty to provide educational opportunities that enable students with a documented disability to access courses, programs, facilities, and services.

The Policy and Procedural Guidelines apply to all students who have identified themselves to the institution as having a documented disability who are inquiring about, applying to, or registered in credit or non-credit courses in both on and off-campus programs.

- [Policy 32.02 - Services Available to Students with a Documented Disability](#)

Academic Integrity

Integrity in academic work is a central element of learning and is the basis of intellectual pursuits in any academic community. It is also your responsibility to abide by the Student Conduct Code and Student Academic Code of Conduct.

- [Academic Integrity](#)

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Links University Policies, Standards, and Guidelines

- University Policies
- Freedom of Information and Protection of Privacy
- Student Conduct and Care (SCC)
- Student Academic Code of Conduct
- Student Affairs
- Academic Regulations
- Equity, Diversity, and Inclusion (EDI)

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