

# COSC 416A/IGS 520 – NoSQL Databases

## Winter 2012 Term 2

**Instructor:** Dr. Ramon Lawrence  
**Class Schedule:** Monday 12:30 p.m. – 2:00 p.m., Wednesday 2:00 to 3:30 p.m.  
**Location:** SCI 234  
**Office Hours:** 2:00–3:30 p.m. Monday/Friday or by appointment  
**Office Location:** ASC 349  
**Phone:** 807-9390  
**E-mail:** [ramon.lawrence@ubc.ca](mailto:ramon.lawrence@ubc.ca) (preferred contact method)  
**Course URL:** <http://people.ok.ubc.ca/rlawrenc/teaching/416/>

### Course Description

*Official Calendar:* Advanced or specialized topics in database design, modeling, and implementation.

### Prerequisite

- COSC 304 – Introduction to Database Systems

### Marking and Evaluation

*Undergraduate students:*

Midterm Exam	25 %
Assignments	75 %

*Graduate students:*

Midterm Exam	25 %
Assignments	50 %
Project	25 %

Graduate students are responsible for performing a project in addition to the regular assignments done by all students. Assignment questions that are optional or bonus marks for undergraduates will often be required and for regular marks for graduate students.

## Expectations

- Attend **all** classes and prepare before attending class.
- Read the lecture notes **before** the lecture.
- Learn the material in the course and undertake sufficient effort to produce all the programming assignments and quality projects.
- Enjoy attending class and feel free to participate according to your personality. Feel free to ask questions by raising your hand or speaking out at appropriate times.
- Please actively participate in class discussions, questions, and problem solving exercises.
- **I want all students to pass the course, receive a good grade, and feel the course was beneficial.**

## Homework Expectation

For this course, it is expected that you will spend *at least six hours per week in out-of-class preparation*.

## Grievances and Complaints Procedures

A student who has a complaint related to this course should follow the procedures summarized below.

- The student should attempt to resolve the matter with the instructor first. Students may talk first to someone other than the instructor if they do not feel, for whatever reason, that they can directly approach the instructor.
- If the complaint is not resolved to the student's satisfaction, the student should go to the departmental chair Sylvie Desjardins at SCI 388, 807-8767.

## Your Responsibilities

Your responsibilities to this class and to your education as a whole include attendance and participation. You have a responsibility to help create a classroom environment where all may learn. At the most basic level, this means you will respect the other members of the class and the instructor and treat them with the courtesy you hope to receive in return. Inappropriate classroom behavior may include: disruption of the classroom atmosphere, engaging in non-class activities, talking on a cell-phone, inappropriate use of profanity in classroom discussion, use of abusive or disrespectful language toward the instructor, a student in the class, or about other individuals or groups.

## Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences. A more detailed description of academic integrity, including the policies and procedures, may be found at <http://web.ubc.ca/okanagan/faculties/resources/academicintegrity.html>. **If you have any questions about how academic integrity applies to this course, please consult with your professor.**

## Disability Services

If you require disability-related accommodations to meet the course objectives please contact the Coordinator of Disability Resources located in the Student development and Advising area of the student services building. For more information about Disability Resources or about academic accommodations visit <http://okanagan.students.ubc.ca/current/disres.cfm>.

## Equity, Human Rights, Discrimination and Harassment

UBC does not condone discrimination or harassment in classrooms, living or work environments on campus. For information about UBC's policies related to equity, human rights, discrimination or harassment please contact: Equity Advisor: ph. 250-807-9291; email [equity.ubco@ubc.ca](mailto:equity.ubco@ubc.ca) Web: [www.ubc.ca/okanagan/equity](http://www.ubc.ca/okanagan/equity)

## Missing an Exam

Only students who miss the final exam for a reason that corresponds to the University of British Columbia Okanagan's policy on excused absences from examinations will be permitted to take the final exam at a later time. A make-up exam may have a question format different from the regular exam. **There will be no make-up midterm exams.** If the reason for absence is satisfactory, the student's final exam will be worth more of the final grade.

## Course Outline

The course has a substantial amount of material to be covered in a short time. This requires the student make a strong effort to keep up with the material discussed in class. Below is an outline of the topics. The professor is not bound to these topics and timelines as they only serve as a general reference.

Week	Dates	Topics Covered and Description
1	January 2	Introduction to Course
2	January 7 and 9	Relational Databases
3	January 14 and 16	Overview of NoSQL Databases
4	January 21 and 23	Map-Reduce: Apache Hadoop and HDFS
5	January 28 and 30	Map-Reduce: Apache Pig
6	February 4 and 6	Map-Reduce: Apache Hive
7	February 11 and 13	<b>No class on Family Day. Midterm exam on February 13th</b>
8	February 18 and 20	<b>No class during mid-term break</b>
9	February 25 and 27	Key-value Stores: Google BigTable, Amazon DynamoDB, Apache Cassandra
10	March 4 and 6	Key-value Stores (in-memory): Redis
11	March 11 and 13	Key-value Stores (B-tree): Berkeley DB
12	March 18 and 20	Document Stores: MongoDB
13	March 25 and 27	Integration systems: OpenLink Virtuoso
14	April 3	Graph databases: Neo4J