ICS 200

Course Outline

Winter, 2020

Instructor: Kevin Rintoul

Email: rintoulk@camosun.ca

Purpose

ICS 200 provides the student with the foundational skills and knowledge needed to become a competent Cloud Computing practitioner. Students will be introduced to Amazon Web Services, learn industry standard design patterns and practices for constructing cloud applications, develop cloud applications using best-of-breed software development tools and deploy and manage running applications. By the end of the course, the student will be prepared to undertake cloud-based software development projects.

Outcomes

By the end of this course students will be able to:

1. Discuss cloud computing opportunities and concerns with key stakeholders in a business setting.

2. Articulate the industry standard cloud computing design patterns and describe when it is appropriate to use them to members of a software development team.

3. Migrate existing line of business applications to the cloud.

4. Develop new cloud computing applications using best-of-breed development tools, design patterns and practices.

5. Diagnose common faults that may arise in a production cloud application.

6. Use cloud management tools effectively within a production environment.

Prerequisites

The following prerequisites are required for ICS 200

1. Second year standing in the ICS program.

2. ICS 226 – Network and Server-Side programming.

3. ICS 212 – Database Management Systems.

Course Texts

Weekly readings and pre-examination study guides sill be made available in D2L.

Course Format

The course will meet twice a week over a 13 week semester. Each week will consist of one two-hour lecture and once three-hour lab. Additional time over and above the allotted lab time may be required to complete lab assignments.

Course Activities

The course lectures will provide the students with foundational cloud computing theory. The weekly three-hour lab will provide the student with opportunities to put these concepts into practice within a real-world cloud environment based on the Amazon Web Services platform. Lab assignments will include case studies, programming assignments, cloud management and troubleshooting activities. A midterm and final exam will be scheduled as will bi-weekly quizzes.

Schedule of Sessions

The following is a tentative schedule of learning. Changes to the schedule and content will be announced during regular class time and will be reflected in D2L. Lecture topics listed here will be covered in class using material from the course texts and other outside resources. Slides, supplementary notes and other course resources will be published in the content area in D2L.

Week	Lecture Topic	Lab Assignment
1	Introduction to ICS-200	No lab this week
2	Introduction to Cloud Computing	Introduction to NodeJS
3	The AWS Platform	The AWS Management Console
4	Security Models	The S3-hosted website
5	Introduction to Lambda Functions	Policies, Groups and Roles
6	Simple Storage Models	Lambda and the AWS API Gateway
7	Relational and NoSQL Storage Models	Introduction to S3
8	Midterm Exam	Introduction to RDS and DynamoDB

9	Message Queues	More Lambda, API Gateway and DynamoDB
10	Serverless Computing	Introduction to Message Queues
11	Cloud Management and Monitoring	Cloud Project - TBD
12	Virtual Machines	Cloud Project - TBD
13	The Well Architected Cloud Application	Cloud Project - TBD

Student Evaluation

Lab Assignments: 40%

Quizzes: 10% (5 quizzes, every other week, online)

Midterm exam: 10% (Tuesday, February 25)

Final Exam: 40% (April 14–April 22, 2020, TBA). Must obtain 55% to pass.

Grades

The following table will be used to assign grades in this course.

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3

60-64	C		2
50-59	D	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite. **A grade of at least *55% must be achieved on final to pass this course.***	1
0-49	F	Minimum level has not been achieved.	0

Policies

Lab Work

The only way to learn cloud computing is by dedicated and sustained practice. For this reason, lab attendance is mandatory throughout the entire semester. Each lab will build on a previous week's completed results and for this reason, it is important that all labs be completed on time. Late assignments will be penalized at the rate of **10% per day and will not be accepted after 5 business days past due**. All labs are to be handed in to their associated assignment area within D2L in ZIP file format. Lab work is expected to be completed using proper software engineering practices and will be graded accordingly. Marking policies will be clearly stated in each week's lab assignment's grading rubric.

Exams

Without exception, all exams must be written at their scheduled time. Having said that, it is acknowledged that emergency situations arise from time to time. When they do, the instructor reserves the right to either issue a makeup exam or adjust the weighting of the course mark accordingly. If an emergency does arise, students must notify the instructor **prior to the exam** and provide documented evidence of the emergency in writing.