

OKANAGAN COLLEGE

COSC 331 – Microservices and Software Architecture

Fall 2020 Section 001

Schedule:

Lecture	Monday, 10:00AM – 11:20AM; Wednesday, 8:00AM – 9:20AM
Lab 01	Thursday, 2:00PM – 3:50PM
Lab 02	Friday, 2:00PM – 3:50PM

Instructor: Matthew Fritter

Office Hours: TBD

Email: mfritter@okanagan.bc.ca

Website: Course notes, labs, and announcements will be posted on Moodle and GitHub:

<https://github.com/MattFritter/COSC331-Microservices>

Calendar Description: Students will be introduced to web services that interact across multiple servers and the need for optimal performance and security. The evolution of enterprise software from legacy enterprise applications to the use of microservice containers and orchestration tools will be explored. Topics will include: distributed computing, integrating existing enterprise applications with microservices, and using patterns of software architecture for design.

Prerequisites: COSC 222, minimum grade of 60%.

Co-requisites: COSC 236, minimum grade of 60%.

Required Text: None. All course materials will be provided through Moodle and GitHub.

Lecture Topics:

- Practical application of microservices software architecture, and an understanding of microservice design and implementation
- Development and deployment of microservices using remote virtual servers, including the development of multi-service applications
- Designing RESTful microservice Application Programming Interfaces (APIs), in addition to stateful and streaming data API interfaces
- Containerization and management of microservice instances, and integration with scalable web hosts

Learning Outcomes:

Students who complete this course will know how to implement a microservice architecture, including development of microservices and the necessary interfacing applications. Students will understand how to deploy microservices and interface with them remotely, using good API

design to ensure security and performance. Students will understand how to use containers to deploy their microservices and automate deployment.

Tentative Topic Schedule:

Week	Description	Date
1	No Labs – Course Introduction	Sep 8 - 11
2	Microservices and microservice architecture	Sep 14 - 18
3	Microservice frontend design, Quiz #1	Sep 21 - 25
4	API design, developing RESTful APIs	Sep 28 - Oct 2
5	Data exchange formats and performance	Oct 5 - 9
6	Stateful API protocols, streaming connections, Quiz #2	Oct 12 - 16
7	Microservice security	Oct 19 - 23
8	Developing scalable applications	Oct 26 - 30
9	Remote monitoring and management, Quiz #3	Nov 2 - 6
10	Containerization: Docker deployment	Nov 9 - 13
11	Kubernetes	Nov 16 - 20
12	Kubernetes, Competitive Lab Project, Quiz #4	Nov 23 - 27
13	Closing Topics, Final Exam Prep	Nov 30 - Dec 4

Labs: Lab material will be uploaded to Github and linked on Moodle. You will have 1-2 weeks to complete each lab. I will be available via Moodle livestream (or Zoom) to provide assistance and answer questions during the lab time blocks, and will also give example demonstrations during these periods. Labs will begin the second week of classes.

Exams: There will be four online quizzes, available via Moodle, spaced throughout the term. Each quiz will be announced in the Monday lecture, and you will have the rest of the week to complete the quiz. Only one attempt at each quiz will be allowed. The final exam will be held during the final exam period (given below) and will consist of both an online question format and a practical component.

Evaluation:

Item	Weight
7 Lab Assignments	50%
4 Online Quizzes, each 5%	20%
Final Exam (Online, with Practical Component)	30%

Important Dates:

- First Day of Class: September 8th
- Last Day to Register or Drop: September 18th
- Thanksgiving: October 12th (Statutory Holiday)

- Remembrance Day: November 11th (Statutory Holiday)
- Last Day of Classes: December 7th
- Final Exam Period: December 9th – December 19th

Academic Integrity:

It is Okanagan College Policy that students are aware of policies regarding academic misconduct (i.e. cheating and plagiarism). These policies are outlined in the 2019-2020 OC Calendar. If you are not aware of policies be sure to read this information. Cheating and plagiarism are summarized below. You are responsible for reading the full description from the OC Calendar, or on the website: <https://webapps-5.okanagan.bc.ca/ok/Calendar/AcademicIntegrity>

Cheating: includes but is not limited to dishonest or attempted dishonest conduct during tests or examinations in which use is made of books, notes, diagrams or other aids excluding those authorized by the examiner. It includes communicating with others for the purpose of obtaining information, copying from the work of others and purposely exposing or conveying information to other students who are taking the test or examination.

Plagiarism: is the presentation of another person's work or ideas without acknowledgment. Students in doubt should take care to avoid unintentional plagiarism by learning proper scholarly procedures.