Welcome to ICTC's WIL Digital: Cloud Computing

ICTC's WIL Digital is an innovative Work Integrated Learning (WIL) program that helps students gain insight and skills to advance learning and meaningful work experience.

Course Overview

This ICTC course is a great opportunity for participants to learn about one of today's most exciting industries, and is a source of knowledge for cloud technologies and their current impact on companies in Canada and around the world.

About this course

This course consists of six modules that cover a variety of topics:

Module	Title	Learning goals
1	Introduction to cloud computing	Analyzing the history of cloud technologies, different service models, and types of cloud infrastructure.
2	Cloud-native application development	Exploring the cloud-native industry, main technologies, and their impact on developers.
3	Cloud economics	Understanding the economics of cloud computing, and the business case building process to justify cloud investments.
4	Business applications	Learning from industry cases and cloud-based implementations.
5	Societal impacts	Exploring potential environmental and social impacts of cloud-enabled systems.
6	Canadian context and career opportunities	Learning about the main actors and related opportunities for cloud computing careers in Canada.

These modules provide an extensive overview of cloud computing and its critical applications. We recommend reviewing this core material and all supplementary content for a comprehensive learning experience.

Targeted audience

This entry-level course is designed for students interested in developing fundamental skills in the subject of cloud computing. Those students who are proficient in this subject matter are encouraged to contact their course facilitator to learn about alternate WIL Digital courses that would provide an excellent lateral understanding of concepts associated with this subject material.

Students will complete each module, which will take approximately 1-2 hours, during their work placement. We suggest taking 1 week per module and 4 weeks to complete the case study.

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Use case #1 - Cloud-enabled machine learning / AI

Context: Artificial intelligence and machine learning, complex domains of expertise, are being applied as a rich variety of technology solutions by different cloud-enabled providers. This is good for everyone in the industry as this broader service offering for AI adopters accelerates level of maturity in this exponentially growing field of machine learning.

[Media description: Icon representing a brain, with several neurones inside, in multiple colors]

Cloud services for machine learning or AI (these terms are interchangeable) are relatively easy to access and use. A company doesn't need to employ AI experts to leverage AI services. Instead, by leveraging cloud computing, they can connect to application programming interfaces (APIs) and make a "call" to remote resources. This ability is helping companies around the world implement new AI-enabled solutions.

A Canadian example: The Royal Bank of Canada. It's not only the big tech companies who are innovating and creating cloud for AI solutions, another terms for cloud enabled machine learning. The Royal Bank of Canada is collaborating with other technology partners—small and large—to create a private AI cloud for financial applications. This is a great example of innovation through collaboration that will enable RBC to implement better AI models, easier and faster, which result in RBC retaining satisfied clients.

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5.2 Data sovereignty

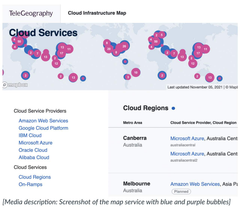
The geographic location of data determines the laws to which the data is subject. This is data sovereignty, a topic that generates plenty of discussion.

Data is by nature globally mobile, so when it comes to data sovereignty, questions must be answered about what laws are applicable. For example, Canadian companies can use cloud services from providers around the world. What happens with their data if it's stored outside of Canada? Do they still own the data? If an issue arises, which country's regulations take precedence, and how are the Canadian organizations protected? These are important questions.

Cloud Canada explains the data sovereignty question this way:

"As data has become more portable in the cloud, the residency of data has struggled to keep up with its portability. Data stored physically in the data centre of one country may also be stored physically in the data centre of another and may cover information that comes from yet another country, making that data subject to the jurisdiction of three different countries. Altogether, data often has overlapping jurisdiction and separate legal requirements…Ultimately, the ownership of data is irrelevant as the location of the physical storage decides which country's laws that data is subject to."

[Media description: Black word map with yellow lines representing connections between continents and regions]



[Media description: Screenshot of the map service with blue and purple bubbles]

https://www.cloudinfrastructuremap.com

Historically, one of the most controversial moments in terms of data sovereignty was a result of the Patriot Act in the USA. In response to the September 11 terrorist attacks Congress passed this Act in October 2001, which was signed into law by President George W. Bush a few weeks later. The USA Patriot Act significantly expanded the search and surveillance powers of federal law-enforcement and intelligence agencies, expanding it even further in 2003.The primary goal of this Act was protection against terrorism, but other additional cases were related to financial crimes, surveillance, border protections, and improved intelligence.

You can see the original document here
https://www.congress.gov/107/plaws/publ56/PLAW-107publ56.pdf

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2.0 Cloud-native application development

Before we start the second module, we will explain how cloud-native compares to the rest of the cloud computing industry. Concretely:

- Cloud computing focuses on the on-demand delivery of infrastructure (hardware/servers), storage, databases, and all kinds of application services via the internet.
- Cloud-native is the architecture for assembling all of the above cloud-based components in a way that is optimized for the cloud environment.

The reason why we have dedicated Module 2 to cloud-native is because of its increasing importance for technology-enabled companies around the world. Cloud-native is an exciting arm of the tech industries and brings with it a new wave of career opportunities. Module 2 will introduce the fundamentals of these technologies, and then we will be ready to discuss industry applications in Module 4.

Before we start, here are some words from instructor Adrian Gonzalez Sanchez.

Intro video

[Media description: Hispanic man with short brown hair and beard, wearing a green turtleneck sweater. The background is a solid yellow color]

If you have any questions, please feel free to contact us at WIL - Cloud Computing <wil-cloudcomputing@ictc-ctic.ca>.

Kind regards,
The WIL Digital Team

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