UVIC FACULTY OF ENGINEERING & COMPUTER SCIENCE

Introduction to Quantum Software Development

Build the Skills to Program the Quantum Future.

A 6-week micro-credential building hands-on quantum programming skills through real-world applications and project-based learning.

UVIC UNIVERSITY OF VICTORIA

FORMAT
Online, self-paced + weekly live sessions (optional)

DURATION
Feb 1 – Mar 12, 2027

CREDENTIAL
UVic Micro-Credential

TIME COMMITMENT
~5–7 hrs/week + optional live sessions

TUITION
$1,800 CAD

AUDIENCE
Developers, STEM grads & tech professionals

Program Overview

Quantum computing is moving beyond research environments and into practical applications across cybersecurity, finance, pharmaceuticals, logistics, manufacturing, energy, and AI. This program gives learners with a background in programming or STEM a practical introduction to quantum computing — building and executing quantum circuits on industry-standard platforms, and connecting core theory to real-world use cases and algorithms. Learners will code real problems and learn to run them on a quantum computer, as well as integrating Generative AI tools into their quantum coding workflow.

What You'll Learn

- Fundamental concepts of quantum computing — qubits, quantum states, and quantum gates
- Quantum circuit design, creation, execution, and measurement
- Quantum communication and cryptographic protocols, including BB84 and quantum teleportation
- Quantum programming with Python across industry platforms (Qiskit, PennyLane, Cirq, Q#, CUDA-Q, Braket, Ocean SDK)
- Foundational and variational quantum algorithms (Grover's, QFT, VQE, QAOA, and more)

Program Structure

Module	Topic	Focus
1	**Intro to Quantum Computing**	Application areas, quantum advantage, hybrid computing
2	**Quantum Computing Basics**	Qubits, gates, superposition, entanglement, circuits
3	**Basic Quantum Protocols**	Superdense coding, teleportation, BB84 QKD
4	**Quantum Hardware Platforms**	Superconducting, trapped-ion, photonic & more
5	**Quantum Programming (Python)**	Core Python for quantum development
6	**Quantum Software Platforms**	Qiskit and PennyLane
7	**Quantum Algorithms**	Grover's, QFT, phase estimation, HHL
8	**Variational Quantum Algorithms**	VQE, QAOA, and optimization applications

Is This Program Right for You?

Ideal for software developers, computer science and engineering students, math/physics graduates, and STEM professionals looking to upskill, reskill, or explore opportunities in quantum computing and emerging technology sectors.

The future of computing is quantum. Start building for it now.

PROGRAM STARTS February 1st, 2027 · INQUIRIES: pp_info@uvic.ca

Subject: Professional development request—University of Victoria quantum computing course

Hi [Manager's name],

I'm requesting support to take the University of Victoria's quantum computing micro-credential. The six-week online course costs $1,800 CAD and requires approximately 5 hours per week.

The course introduces algorithms designed for quantum computers and the programming methods used to implement them, with hands-on use of AI tools to help write, test and refine quantum code more efficiently. Through a practical optimization exercise on a quantum computer, I'll gain experience translating a real problem into a quantum approach, running it and interpreting the results. This would build our ability to evaluate potential uses as quantum technology develops.

I'm requesting [tuition funding and/or study time]. Afterward, I would share the key lessons and propose a small experiment relevant to our team.

Thank you for considering this request.

[Name]