

ELEC 4678/5678 (PHYS 4980/5980) – Intro. to Quantum Computing

The course teaches students the principles, the algorithms, and the programming methods of quantum computing, and also discusses the associated physics and mathematics background required. Other related topics such as quantum communication and quantum entanglement will also be covered.

Semesters: Spring 2022, 2023 and 2024





ELEC 4679/5679 (PHYS 4679/5679) - Quantum Computing Algorithms

The course presents several seminal quantum algorithms, including quantum Fourier transforms, Grover's and Shor's algorithms, followed by explaining several advanced quantum computing algorithms, including quantum error correction, sparse linear systems, and the variational eigensolver. The Google Cirq quantum programming library will be used for actual quantum programming implementations of algorithms.

Semesters: Fall 2022, 2023 and 2024

ELEC 4680/5680 (PHYS 4680/5680) - Quantum Computing Technology

Students will explore hardware and experimental practices for realizing quantum computers. They will engage in laboratory practice of relevant skills including highperformance analog electronics; optics based quantum encryption and eraser implementations; RF electronics; and vacuum and cryogenic techniques.

Semesters: Fall 2022, 2023 and 2024



Students (both undergrad and graduate) and professionals taking these three courses will receive the Quantum Computing Micro-Credential offered by the CU-Denver College of Engineering, Design and Computing.



College of Engineering, Design and Computing

engineering@ucdenver.edu