

# MATH 4821/5821 (Online)

## Quantum Computing

Fall 2020

**Instructor:** Dr. Yuly Billig

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*Since this is the first time that this course is offered fully online, some details of this course outline may be modified during the term.*

Course material is hosted on **CULearn**.

**Lectures** are pre-recorded.

**Office Hours** Tuesdays 10:05am

<b>Method of Evaluation:</b>	Home Assignments	35%
	Test 1	25%
	Test 2	40%

Each test will have two components: (A) an open-book written part and (B) an oral examination.

Written part of **Test 1** will be held on Thursday October 15.

Written part of **Test 2** is a take-home test and will be completed during the week of Nov. 13 - Nov. 20.

There will be **no Final Exam**.

### Topics Covered:

- Basics of quantum mechanics. Quantum states.
- Quantum entanglement.
- Classical and quantum information theory.
- Quantum computations.
- Quantum cryptography.
- Shor's quantum algorithm for fast factorization.
- Additional selected topics

**Academic Accommodation.** You may need special arrangements to meet your academic obligations during the term. For an accommodation request the processes are as follows:

**Pregnancy obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide:

<https://devsite.carleton.ca/equity/wp-content/uploads/Student-Guide-to-Academic-Accommodation.pdf>

**Religious obligation:** write to me with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details see the Student Guide.

**Academic Accommodations for Students with Disabilities:** The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or [pmc@carleton.ca](mailto:pmc@carleton.ca) for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your Letter of Accommodation at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (if applicable). After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website for the deadline to request accommodations for the formally-scheduled exam (if applicable).