

Intro to Quantum Computation, Summer 2021

City College of New York

Course: PHYS 31415, Introduction to Quantum Computation
Professor: Seth Cottrell, cottrell.tech@gmail.com
Class: Zoom, MWF 12:00-2:00
Grading: 35% Homework, 30% Exams, 35% Qiskit Projects
Office Hours: TBD

I don't expect you to be good at math or to know any of the material, but I do expect you to work hard and ask for help. You are expected to strive to understand the material presented in this course, to do all of the work yourself, and to ask for help when you get stuck. Never copy any material from any source at any time, and email me questions whenever you're stuck or lost.

Seriously, email me all the time. You are not a burden, you are the point.

Cheating will be reported immediately and result in "... disciplinary sanctions, including suspension, or expulsion." and a zero on the offending assignment or exam.

Course Schedule:

Take this schedule with a grain of salt, as we may need to adapt as we go along.

Date:	Lecture:
M 6/7	#1 The Quantum State
W 6/9	#2 Dirac Notation and Measurements
F 6/11	#3 Operators and Eigenstates
M 6/14	#4 Composite Systems
W 6/16	#5 Quantum Circuits
M 6/21	#6 Density Matrices
W 6/23	#7 The Grover Search Algorithm
F 6/25	#8 Classical Information
M 6/28	#9 Entanglement
W 6/30	#10 Quantum Information I
F 7/2	#11 Quantum Information II
W 7/7	#12 Quantum Communication
F 7/9	#13 The Quantum Fourier Transform
M 7/12	#14 Shor's Algorithm
W 7/14	#15 Quantum Networks
F 7/16	#16 Generalized Quantum Measurements
M 7/19	#17 Quantum Noise
W 7/21	#16 Quantum Error Correction
F 7/23	#17 Coherence and the Quantum Eraser
M 7/26	#18 Observers

Non-Essential Reference Materials:

“Elements of Information Theory”, Cover and Thomas

“Introduction to the Theory of Quantum Information Processing”, Berjou and Hillery

“Quantum Computation and Quantum Information”, Nielsen and Chuang

Preskill Lecture Notes, <http://theory.caltech.edu/~preskill/ph229/>