Syllabus for Spring 2025

11-860 Quantum Computing, Cryptography and Machine Learning Lab

Venue: Gates Hillman Center GHC 4215; **Time:** M/W 5:00-6:20 PM)

DATE	TOPIC
13-Jan (M)	Transition from classical to quantum computing
15-Jan (W)	Measurement, No Cloning, and BB84
20-Jan (M)	Martin Luther King Jr. Day
22-Jan (W)	Lab
27-Jan (M)	1 qubit gates [**Homework1**]
29-Jan (W)	Lab
03-Feb (M)	CHSH and No Communication
05-Feb (W)	Lab
10-Feb (M)	Multi-qubit gates
12-Feb (W)	Lab
17-Feb (M)	Building a quantum circuit for a classical problem
19-Feb (W)	Lab [**Homework2**]
24-Feb (M)	Crypt/Nvidia/Classic/QuEra
26-Feb (W)	**08:** Deutsche's algorithm
03-Mar (M)	Spring break
05-Mar (W)	Spring break
10-Mar (M)	Lab
12-Mar (W)	Simon's algorithm
17-Mar (M)	Lab
19-Mar (W)	Grover's algorithm
24-Mar (M)	Lab
26-Mar (W)	**11:** Shor's algorithm [**Homework3**]
31-Mar (M)	Lab
02-Apr (W)	Data encoding
07-Apr (M)	Lab
09-Apr (W)	Inner products and linear classifiers
14-Apr (M)	Lab
16-Apr (W)	Quantum kernels and neural networks
21-Apr (M)	Lab
23-Apr (W)	Losses and training