COURSE 2 · ONE-MONTH CRASH COURSE

The Complete Quantum Computing Course

Monthly Schedule · Two lectures per week

4	8	20	10
WEEKS	LECTURES	CONTACT HOURS	MODULES

Tuesday & Friday · 4:00 – 6:30 PM

Week 1	Week 2	Week 3	Week 4
Foundations & Python	Qiskit	Algorithms	Shor, Hardware & Assessment

Schedule · Weeks 1–2

1 Week 1 · Foundations & Python

L-01

Tuesday
4:00 – 6:30 PM

Maths
M01 + M02-A
2.5 hrs

Mathematics & Quantum Physics, Part 1

- Course setup and tools
- Probability, complex numbers, matrices
- Classical vs quantum computing
- Superposition and interference

L-02

Friday
4:00 – 6:30 PM

Mixed
M02-B + M03-A
2.5 hrs

Qubits, Physics & Python, Part 1

- Entanglement, bra-ket notation
- Multi-qubit systems
- Python basics: variables, control flow
- Functions

2 Week 2 · Qiskit

L-03

Tuesday
4:00 – 6:30 PM

Lab
M03-B + M04-A
2.5 hrs

Python OOP & Qiskit 101

- Object-oriented Python, libraries
- Classical and quantum gates
- IBM account setup
- First circuits on simulators

L-04

Friday
4:00 – 6:30 PM

Lab
M04-B + M05
2.5 hrs

Real IBMQ Hardware & Protocols

- Running on real quantum hardware
- Toffoli gate
- Superdense coding, teleportation
- Quiz 1

Maths · Theory · Lab · Review · Mixed

Schedule · Weeks 3–4

3 Week 3 · Algorithms

L-05

Tuesday
4:00 – 6:30 PM

Theory
M06 + M07
2.5 hrs

Bernstein-Vazirani & Deutsch

- Oracle problems
- Bernstein-Vazirani circuit
- Deutsch's algorithm
- Qiskit implementation

L-06

Friday
4:00 – 6:30 PM

Lab
M08
2.5 hrs

Grover's Search Algorithm

- Classical vs quantum search
- Oracle and diffusion
- Run on IBMQ
- Quiz 2

4 Week 4 · Shor, Hardware & Assessment

L-07

Tuesday
4:00 – 6:30 PM

Theory
M09 + M10
2.5 hrs

Shor, QFT & Hardware

- RSA and factoring
- Quantum Fourier Transform
- Quantum phase estimation
- Hardware landscape

L-08

Friday
4:00 – 6:30 PM

Review
Review
2.5 hrs

Review, Final Assessment & Quiz 3

- Course review and Q&A
- Final assessment
- Quiz 3
- Next steps and resources

Maths · Theory · Lab · Review · Mixed