



FREE online workshop, co-organised by QAfrica and QWorld: QBronze147 | Quantum Computing and Programming Workshop 2-6 December 2024

Co-organised by QAfrica and QWorld, this introductory-level workshop teaches the fundamentals of quantum computing and programming. Participants will use Bronze-Qiskit, an introductory tutorial by QWorld, to explore quantum concepts and practice coding with the Qiskit library.

Key features

- **Interactive learning:**
 - Participants will watch recorded lectures, complete Jupyter notebook exercises, and receive mentorship.
- **Hands-on practice:**

Work individually on sections such as:

 - Basics of classical and quantum systems
 - Quantum operators and protocols
 - Quantum search algorithms
- **Homework & Certification:**
 - Five assignments (100 points total).
 - Earn a diploma by achieving 50% on each assignment and scoring 70 points overall.

Key requirements

- Educational materials, lectures, and mentoring will be in English, with additional mentoring available in select other languages.
- Familiarity with at least one programming language. Participants new to Python should review it before the workshop.
- Pre-workshop preparation: Installation instructions and foundational materials on math basics will be provided.

Who can attend?

This workshop is open to high school learners, university students, graduates, researchers, professors, and industry professionals.

Need more info?

Visit <https://qworld.net/qbronze147> or email qafrica@qworld.net

Schedule

Monday, 2 December, 17:00 – 20:00 SAST

- **17h00–18h00:** Talk by Prof Ahmed Younes (Alexandria University): 'Getting Started with Quantum Computing Tech'
- **18h00–20h00:** One Bit, Coin Flipping, Coin Flipping Game, Probabilistic States, Probabilistic Operators, Two Probabilistic Bits, Correlation, Operators on Multiple Bits

Tuesday, 3 December, 18:00 – 20:00 SAST

Quantum Coin Flipping, First Quantum Programs with Qiskit, Hadamard Operator, One Qubit, Quantum State, Superposition and Measurement, Visualisation of a (Real-Valued) Qubit

Wednesday, 4 December, 18:00 – 20:00 SAST

Operations on the Unit Circle, Rotations, Reflections, Quantum Tomography, Two Qubits, Phase Kickback

Thursday, 5 December, 18:00 – 20:00 SAST

Entanglement and Superdense Coding, Quantum Teleportation, Multiple Control Constructions

Friday, 6 December, 18:00 – 20:00 SAST

Inversion About the Mean, Grover's Search: One Qubit Representation, Grover's Search: Implementation

APPLY AT:

<https://qworld.net/qbronze147>