DevOpsSchool

Course curriculum · November 2026

LEVEL 04 OF 04 · ADVANCED

Quantum Computing Advanced Training

Assess fault-tolerant quantum computing, post-quantum cryptography and real applications, and plan an organisation's quantum strategy.

LIVE ONLINE **Max 8-10 hours**	CORPORATE (DAY-WISE) **5 days · Days 1-5**	SELF-PACED VIDEO **1-year LMS access**
BATCH SIZE **Max 10 learners**	NEXT BATCHES **1st of every month · weekends: first Saturday**	CERTIFICATE **Verifiable certificate of completion**

Foundation	Essential	Intermediate	Advanced
1 day · Included	2 days · Included	3 days · Included	5 days · This curriculum

INSIDE THIS CURRICULUM

What you will achieve	Outcomes and level focus
Who should attend	Audience and prerequisites
Agenda	45 topics · Foundation to Advanced
Hands-on labs	4 labs
Formats and fees	Live, 1:1, self-paced, corporate
Trainer and reviews	Rajesh Kumar
Enrolment	Batches, payment, contacts

WHY DEVOPSSCHOOL

- Rated 4.6 on Google
- 1,500+ verifiable certificates issued in the public registry
- Trainer Rajesh Kumar: 20 years in industry
- Small batches: max 10 learners, every session recorded

Course page: www.devopsschool.com/courses/quantumcomputing/quantum-computing-advance-training.html
Talk to us: WhatsApp +91 99057 40781 · +1 (469) 756-6329 · contact@DevOpsSchool.com · reply within 1 hour

OUTCOMES

What you will achieve

By the end of the Quantum Computing course path, you will be able to:

1

Understand quantum computing

Explain qubits, gates, entanglement and measurement and reason about quantum circuits.

2

Program quantum algorithms

Implement and run core and variational quantum algorithms in Qiskit on simulators and hardware.

3

Plan for the quantum era

Evaluate fault tolerance, post-quantum cryptography and real use cases for your organisation.

WHAT THE ADVANCED LEVEL ADDS

Error correction, fault tolerance, PQC and applications

Hands-on: Deliver a quantum feasibility study. Pick a chemistry, optimisation or ML problem, implement it on hardware with mitigation, estimate fault-tolerant resources and write a feasibility report.

WHO SHOULD ATTEND

- Experienced Quantum Computing practitioners responsible for quality, security and scale.
- Senior engineers, architects and leads who design and troubleshoot Quantum Computing solutions.
- Teams making Quantum Computing an organisation-wide standard.

BEFORE YOU START

- The Intermediate level, or equivalent hands-on experience.
- You can already: Run useful workloads on noisy hardware with error mitigation and transpiler control, and build variational and quantum machine learning models.
- Basic computer skills and a laptop with a stable internet connection for the live sessions and labs.
- This curriculum includes every earlier level, so it is complete on its own.

AGENDA · FOUNDATION TO ADVANCED

Quantum Computing Advanced Training agenda

45 topics. Each level builds on the one before it, so this curriculum lists every earlier level in full. Days are for corporate (day-wise) delivery; live online batches cover the same agenda in max 8-10 hours.

DAY 1 — Foundation: Qubits, gates, circuits and first Qiskit program

Included from Foundation

1. Classical vs quantum computing: bits vs qubits, what quantum computers can and cannot speed up
2. Mathematical toolkit: complex numbers, vectors, matrices, Dirac notation and tensor products
3. Qubits and superposition: state vectors, amplitudes, probabilities and the Bloch sphere
4. Measurement: the Born rule, collapse, measurement bases and repeated shots
5. Single-qubit gates: X, Y, Z, Hadamard, S, T and rotation gates as unitary matrices
6. Multi-qubit systems and entanglement: CNOT, Bell states and why entanglement matters
7. Quantum circuits: reading circuit diagrams, gate order, classical registers and measurement
8. Quantum hardware landscape: superconducting, trapped-ion, neutral-atom, photonic and spin qubits
9. Setting up Qiskit: Python environment, pip install qiskit, Jupyter and the Aer simulator
10. First program: building a Bell-state circuit, simulating it and plotting measurement counts
11. Cloud access: creating an IBM Quantum account and exploring available backends

DAY 2 — Essential: Core quantum algorithms and protocols

Included from Essential

12. Qiskit in depth: QuantumCircuit, parameters, transpile, and the Estimator and shot-based execution primitives
13. Quantum teleportation: protocol, circuit and classical feed-forward
14. Superdense coding: sending two classical bits with one qubit and shared entanglement
15. Phase kickback and oracles: building oracle circuits for query algorithms
16. Deutsch-Jozsa and Bernstein-Vazirani algorithms: exponential and linear query separations
17. Simon's algorithm: hidden period finding and its role leading to Shor
18. Grover's search: amplitude amplification, oracle and diffuser design and optimal iteration count
19. Quantum Fourier transform: circuit construction and comparison with the classical FFT
20. Quantum phase estimation: eigenvalue estimation with the inverse QFT
21. Shor's algorithm: period finding for factoring and why it threatens RSA
22. Running on real hardware: submitting jobs with Qiskit Runtime, queues and reading results

DAY 3 — Intermediate: Noise, error mitigation, variational algorithms and QML

Included from Intermediate

23. Noise and decoherence: T1 and T2 times, gate errors, readout errors and crosstalk
24. Noise simulation: noise models in Qiskit Aer and fake backends for realistic testing
25. Error mitigation: readout mitigation, zero-noise extrapolation and dynamical decoupling
26. Transpilation: qubit mapping, routing, basis gates, optimisation levels and circuit depth
27. Variational quantum eigensolver: ansatz design, classical optimisers and expectation values
28. QAOA: encoding combinatorial optimisation problems such as Max-Cut as Hamiltonians
29. Quantum machine learning: feature maps, quantum kernels and variational classifiers
30. Other SDKs: Cirq, PennyLane, Amazon Braket, Azure Quantum and NVIDIA CUDA-Q

31. Hybrid workflows: combining classical and quantum steps, sessions and batch execution
32. Benchmarking: quantum volume, layer fidelity and comparing devices
33. Troubleshooting: deep circuits, barren plateaus, poor convergence and noisy results

DAYS 4-5 **Advanced: Error correction, fault tolerance, PQC and applications** — New at this level

34. Quantum error correction: repetition and stabilizer codes, syndromes and logical qubits
35. Surface codes and thresholds: below-threshold operation and the path to fault tolerance
36. Fault-tolerant computing: magic states, T-gate costs and logical gate sets
37. Resource estimation: estimating physical qubits and runtime for algorithms such as Shor
38. Post-quantum cryptography: NIST ML-KEM, ML-DSA and SLH-DSA standards and harvest-now-decrypt-later risk
39. PQC migration: crypto inventory, crypto-agility and hybrid key exchange in TLS
40. Quantum chemistry and materials: Hamiltonian simulation and VQE for molecular problems
41. Optimisation and finance use cases: portfolio, scheduling and Monte Carlo speed-up candidates
42. Quantum advantage: evaluating claims, classical simulation limits and honest benchmarking
43. Hybrid HPC and quantum: integrating quantum processors with classical supercomputing workflows
44. Quantum strategy: identifying use cases, skills, vendor-neutral roadmaps and pilot design
45. Capstone: build, mitigate and evaluate a quantum solution for a chosen use case and report its feasibility

PRACTICE

Hands-on labs

You build these yourself during the course, guided by the trainer.

FOUNDATION

Build and run a Bell-state circuit

Build single-qubit and Bell-state circuits in Qiskit, run them on the simulator, and explain the measured probability distributions.

ESSENTIAL

Implement Grover's search

Build an oracle and diffuser for a 3-qubit Grover search, run it on a simulator and real hardware, and compare success rates.

INTERMEDIATE

Solve Max-Cut with QAOA

Formulate a small graph Max-Cut problem, solve it with QAOA on a noisy simulator and hardware, and improve results with error mitigation.

ADVANCED

Deliver a quantum feasibility study

Pick a chemistry, optimisation or ML problem, implement it on hardware with mitigation, estimate fault-tolerant resources and write a feasibility report.

HOW YOU CAN LEARN

Formats and fees

The same agenda in four formats. Fees are in Indian rupees as of November 2026; the course page shows them in your currency.

FORMAT	DURATION	WHAT YOU GET	FEE
Live & interactive (online)	Max 8-10 hours	Instructor-led public batch of max 10 learners with demos, labs, Q&A and assignment review. Weekday batches start on the 1st of every month, weekend batches on the first Saturday of every month.	**INR 34,999**
1:1 live training (online)	Max 8-10 hours, one-to-one	The same agenda, taught one-to-one by the trainer. Starts immediately, without waiting for the next batch; sessions planned around your working hours, at your pace.	**INR 99,999**
Self-paced video	1-year LMS access	All four Quantum Computing levels, plus 20+ more courses and 50+ tools, at your own pace.	**INR 833/month** billed yearly at INR 9,996
Corporate (day-wise)	5 days for this level	A private batch for your team, on demand. Foundation 1 day, Essential 2, Intermediate 3, Advanced 5 (cumulative).	**Quote on request**

ASSESSMENT AND CERTIFICATE

Your progress is checked through hands-on labs and assignments at every level. On completion you receive a DevOpsSchool certificate of completion with a unique credential ID that anyone can verify at devopsschool.com/certificates.

INCLUDED WITH EVERY LIVE BATCH

- Every live session is recorded and stays in your LMS for a year.
- Can't attend your batch? Move to next month's batch.
- Free demo class before you pay.
- Free 10-15 minute call with an advisor or the trainer to check the course fits you.

YOUR TRAINER

Learn from Rajesh Kumar

Principal Architect, trainer and mentor in DevOps, SRE, DevSecOps and platform engineering, with 20 years across 8+ software MNCs, including Staff DevOps/SRE Engineer for a leading Japanese mobile-payment platform and Principal DevOps Architect and Manager in Europe.

Profile: www.rajeshkumar.xyz · Videos: youtube.com/@TheDevOpsSchool

20 years in industry	**200+** corporate trainings
10,000+ engineers mentored	**70+** organisations coached

REVIEWS

What learners say

Rated 4.6 on Google · more reviews at devopsschool.com/testimonials and in our video testimonials.

> “Rajesh is very good trainer. Rajesh was able to resolve our queries and question effectively. We really liked the hands-on examples covered during this training program.”
>
> Indrayani, India

> “The training was very useful and interactive. Rajesh helped develop the confidence of all.”
>
> Abhinav Gupta, Pune

START YOUR QUANTUM COMPUTING TRAINING

Join the next batch

Weekday batches start on the 1st of every month and weekend batches on the first Saturday of every month, with max 10 learners each. 1:1 training can start immediately; corporate batches run on demand. We reply within 1 hour.

Pay by UPI, credit and debit cards, net banking or PayPal. Before you pay, read our refund policy. All levels of this course: www.devopsschool.com/courses/quantumcomputing/

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