

QUANTUM SECURITY & PQC

Hybrid Cryptographic Implementations

TECHNICAL DEEP DIVE

Examine how to combine classical and post-quantum cryptography, assess the security properties of different approaches and plan deployment, testing and eventual exit.

DURATION

4 hours

Short professional course

LEVEL

Advanced

Protocol familiarity assumed

ON-DEMAND FEE

US\$499

Online on-demand

Engineer the transition deliberately.

WHAT YOU WILL LEARN

- ✓ Compare hybrid key-exchange constructions and their security assumptions.
- ✓ Select signature approaches with attention to maturity and use case.
- ✓ Measure performance and message-size costs on target protocols.
- ✓ Manage fallback and define criteria for retiring classical components.

WHO SHOULD ATTEND

Cryptography engineers, protocol implementers and security architects making deployment decisions for TLS, SSH, VPNs and code signing.

PREREQUISITES

Working protocol familiarity is assumed. PQC fundamentals recommended; Foundation or PQCS Training is optional.

Why Quantum Academy

The course draws on the Applied Quantum PQC Migration Framework and faculty experience running migration programs inside organizations.

What you will study

Hybrid key exchange, signatures, protocol integration and exit planning.

01 Hybrid Cryptography Foundations

Examine the rationale for hybrid approaches, their security assumptions and guidance. Assess when hybrid or post-quantum-only designs fit the use case.

02 Hybrid Key Exchange

Compare concatenation and KDF-based combiners. Study negotiation, fallback and performance, with hands-on hybrid TLS configuration.

03 Hybrid Signatures

Compare nested, composite and dual-certificate approaches. Assess signature size, performance and uses in code, document and long-lived trust signing.

04 Protocol Integration and Exit Planning

Plan integration with TLS, SSH, IPsec and application protocols. Measure deployment behavior and define criteria for removing classical components.

Formats and fees

Online on-demand	US\$499
Live online	US\$749
In person	US\$999
Private team training	Custom quote

What is included

- Course handbook: full material with written instructor notes.
- 180 days of online on-demand access. Where that course is not yet published, the 180 days start on the day it is.
- PDF copy of Quantum Ready by Marin Ivezic, at no extra cost.

Includes a certificate of completion, not professional certification. CPE earned may apply toward Quantum Academy certification maintenance.

Explore the course

[View course details at QuantumAcademy.com](https://quantumacademy.com)



On-demand enrollment opens soon. Check the course page for live dates and availability.

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