

# QuantumShield Report

Target: <https://hbku.edu.qa>

Risk Level: LONG TERM POST QUANTUM CRYPTOGRAPHY

LONG TERM POST QUANTUM CRYPTOGRAPHY RISK — Shor-vulnerable components detected

## Component Analysis:

- Certificate signature: RSA — Shor-vulnerable
- Key exchange: Hybrid PQC (Kyber/ML-KEM) — Quantum-safe
- TLS 1.3 — Modern

## Recommended Fixes:

- Replace RSA signature with Dilithium (ML-DSA)
- Key exchange already quantum-safe — keep it!

## Sample Kyber Code (Key Exchange):

```
from oqs import KeyEncapsulation

kem = KeyEncapsulation("Kyber512")
public_key = kem.generate_keypair()
ciphertext, shared_secret = kem.encap_secret(public_key)
# Use shared_secret for symmetric encryption (AES-256)
```

## Sample Dilithium Code (Signature):

```
from oqs import Signature

sig = Signature("Dilithium2")
public_key = sig.generate_keypair()
message = b"Hello quantum-safe world"
signature = sig.sign(message)
# Verify: sig.verify(message, signature)
```

*Generated by QuantumShield — Prepare for the quantum era*