QWORLD

**UNIVERSITY OF LATVIA
FACULTY OF SCIENCE
AND TECHNOLOGY**

QCOURSE 501-2

Elements of Quantum Computing and Programming
September 2024 - December 2024

CERTIFICATE

Saurabh Suman

passed QCourse 501-2 with grade 97 out of 100

Graduate level, 3 ECTS credits
(32 academic hours and 48 individual study hours)
Accreditation: This edition was conducted in collaboration with the Department
of Computer Science (Faculty of Science and Technology, University of Latvia)
based on DatZD014 "Elements of Quantum Computing and Programming".

Guntis Arnicāns

Prof. Guntis Arnicāns
(Head of Department Computer
Science, University of Latvia)

Abuzer Yakaryilmaz

Dr. Abuzer Yakaryilmaz
(University of Latvia
& QWorld)

Rumlah Amer

H. Rumlah Amer
(QWorld)

QKD lecturer: Dr. Aeysha Khalique (NUST Islamabad)

QCourse501-2-141

Base content: Review of Python, mathematics, and quantum mechanics. Basics of classical and quantum systems.
Superposition and measurement. Operations on real-valued qubits. Entanglement, superdense coding,
and quantum teleportation. Bloch sphere and complex-valued quantum operators.
Self-study module "Quantum Key Distribution": Classical cryptography & compromised security,
quantum features leading to quantum cryptography, BB84, BBM92, Security Analysis & Adversary Attacks.

**Latvijas
Kvantu
iniciatīva**