



# Unlock Your Quantum AI Powers

Propel Your Growth with Terra  
Quantum's World-Class  
Quantum Machine Learning  
Course

Interactive, Expert-Led Course: Online or On-Site

2024

The pace of innovation is ever-increasing. From AI to quantum technologies, we are witnessing acceleration everyday. To stay ahead of the curve, it's crucial to equip your team with the cutting-edge skills and knowledge to harness the transformative potential of quantum computing and machine learning.

Terra Quantum's comprehensive Quantum Machine Learning (QML) training program is your launchpad into AI's next frontier. Through hands-on experience with hybrid quantum models, you'll gain the expertise to revolutionize your approach to business challenges and drive groundbreaking research. Unlock your quantum AI superpowers and empower your organization to innovate at the forefront of this dynamic field.

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# Course Overview

Quantum Machine Learning combines the principles of quantum computing with the techniques of machine learning to create powerful models capable of processing more complex data sets faster, uncovering subtleties and intricate relationships within data points.

Through five, 2-hour training sessions with experts in machine learning, you'll learn the fundamentals of Quantum Computing, dive deeper into Quantum Machine Learning and Quantum AI, practice creating your own Hybrid Quantum ML models, apply these to real-world use cases and demonstrate performance gains.

## Program Goals

1

### Understand the Fundamentals

Grasp the basic principles of quantum computing and how they can be applied to machine learning.

2

### Develop Valuable QML Skills

Learn to implement quantum algorithms and develop QML models for solving real-world problems.

3

### Consolidate with Practical Application

Get hands-on with real-world QML applications using Terra Quantum's user-friendly tools and experimentation platform.

4

### Foster Impact & Innovation

Encourage creative thinking and innovation in the field of QML through collaborative projects and discussions.

# Key Outcomes and Helpful Prerequisites

## Key Outcomes

- **Solid Foundation** in quantum computing basics and machine learning intersection
- **Strategic Understanding** of QML advantages, limitations and applications
- **Hands-On Experience** with quantum programming languages and TQml toolbox
- **Project Development** skills from ideation to execution, specific to QML tasks
- **Community and Networking** opportunities
- **Industry Recognized Certification** from Terra Quantum

## It's Good to Have

While not mandatory, these elements will enhance your learning experience:

- A foundation in classical machine learning and linear algebra - the building blocks of QML
- Programming knowledge, especially in Python - the language that powers cutting-edge AI
- We'll share a pre-reading list of seminal articles and papers
- Curiosity and a thirst for exploration
- Your laptop and note-taking tools - to capture your aha moments

# Tools and Training Format

The course will give you access to Terra Quantum's cutting-edge QML Platform, TQml, empowering users to effortlessly experiment with quantum algorithms and hybrid QML models. With seamless integration of advanced QML libraries, quantum simulators, and CPU/GPU, TQml offers a user-friendly low-code web interface for experimentation.

For deeper exploration and access to native Quantum Processing Units (QPUs), you'll also be able to leverage our enterprise-grade, secure cloud platform [TQ42](#) and its QML SDK.

## Modular Content

The program is structured into modules, each covering different aspects of QML, from theoretical foundations to practical applications.

## Interactive Sessions

Live workshops and webinars with experts in the field, providing insights into cutting-edge research and applications.

## Hands-On Projects

Participants will work on projects individually or in groups, applying QML concepts to solve challenges.

## Continuous Support

Access to experts for discussing ideas, challenges, and solutions.

# The Steps In Your QML Learning Journey

## Session 1: Introduction to Quantum Computing

Covers fundamental concepts, mathematical foundations, quantum bits, gates, and operations. Includes an icebreaker activity and hands-on experience with interactive Jupyter Notebooks.

1

## Session 2: Deep Dive into Quantum Machine Learning

Focuses on Variational Quantum Circuits (VQC), quantum circuit parameters, and optimization. Includes hands-on experience creating and training a simple Quantum Neural Network.

2

## Session 3: Time Series Signal Forecasting using QML & QPU Integrating

Covers quantum neural networks, hybrid quantum neural networks, and time series prediction in toy and industrial examples. Also includes how to run quantum algorithms on real QPU devices.

3

## Session 4: TQml Framework

Introduces TQnet, TQcirc, TQtune, TQbench, and TQCompressor, covering design, analysis, optimization, and benchmarking of QML models.

4

## Session 5: Applications of Quantum Computing & Open Q&A

Deep dive into selected applications and use cases, with open Q&A to answer all remaining questions.

5

# FAQs and Practical Information

**6h/w**

Estimated weekly effort dedicated to the course.

**30h**

Recommended effort to complete the course.

**Enquire**

Please reach out for pricing information

How do I apply?

Please register your interest by submitting the enrollment form below, also available on the TQ Academy webpage.

[ENROLL HERE](#)

Is there a selection process?

Join us on a learning journey where everyone is welcome, regardless of skill level.

What is the weekly learning rhythm during the program?

This is an instructor-led, live course delivered virtually. We propose 1 session per week, however you can let us know what rhythm better suits your organization.

Will I have to take an exam for the certification?

Everyone who completes the course will earn a certification; however, there will be practical assignments to complete during the course.

# Empower Your Future: Take Action Now



## Enroll Today

Register your interest by submitting this form and let us know which course you'd like to take.

## Complete The Course

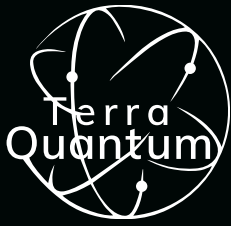
Immerse yourself in the QML learning experience. Please engage with our expert instructors for any questions!

## Stay Connected

Follow [Terra Quantum AG](#) on LinkedIn for updates and keep engaging with the community.

[ENROLL NOW](#)





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