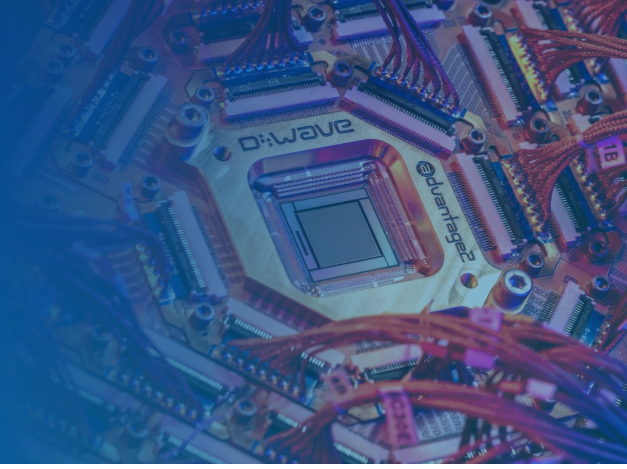
D-Wave
QUANTUM REALIZED.

Build Practical Quantum Skills with D-Wave Training



Upskill and advance your career with D-Wave's application-focused, hands-on training in quantum computing and quantum programming.

D-Wave training helps you turn quantum computing concepts into practical skills you can apply to real-world optimization challenges. Whether you are exploring quantum for the first time, evaluating potential use cases, building mathematical models, or developing applications, our courses provide a clear path to grow your capabilities. Choose from introductory and technical learning options, then progress into hands-on work with D-Wave™ hybrid solvers and annealing quantum computing through the Leap™ quantum cloud service.

LEARNING PATHS

Select Your Quantum Learning Path

Craft the learning experience that best matches your role and goals. Build a broad understanding of quantum computing, learn how to identify and describe promising optimization use cases, or go beyond the fundamentals with courses designed for hands-on application development.

EXPERIENCE LEVEL	GOAL **Quickly Build a Quantum Optimization Application**	GOAL **Research or Explore Quantum Optimization**
Beginner	**01** Introduction to Quantum Computing **02** Getting Started with Applied Quantum Optimization	**01** Introduction to Quantum Computing **05** Foundations for Quantum Programming
Intermediate – Advanced	**03** Problem Formulation for Applied Quantum Optimization **04** Implementation of Applied Quantum Optimization Models	**06** Quantum Programming Core

Applied Quantum Optimization Learning Path

The Applied Quantum Optimization learning path is a series of courses that support learners in designing, developing, and deploying hybrid-quantum applications for optimization. Tailored to supporting real-world optimization problems, these courses enable learners to identify the best use cases for quantum, formulate mathematical models that accurately represent business needs, convert mathematical models into code suitable for submission to the Stride™ hybrid solver, and implement production-scale quantum applications.

Getting Started with Applied Quantum Optimization

- Identify optimization problems that can be solved using D-Wave's quantum-classical hybrid technology.
- Describe optimization problems in a way that allows developers to model them.

Problem Formulation for Applied Quantum Optimization

- Develop mathematical models of optimization problems that are suitable for solving with D-Wave's nonlinear solver, known as the Stride hybrid solver.

Implementation of Applied Quantum Optimization Models

- Translate mathematical formulations into Python.
- Validate optimization models.
- Use key performance metrics to evaluate equivalent optimization models.

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COURSE CATALOG

Explore the Courses

Review each course to find the learning experience that best supports your goals and current level of experience.

01

BEGINNER

Introduction to Quantum Computing

Quantum computing is an exciting, growing field. However, many of the concepts around quantum computers may seem confusing or counter-intuitive based on our prior experiences. This course helps demystify some of those concepts and explains, at a very general level, how a quantum computer works. You will learn about multiple types of quantum computers and how they may be used to solve large, complex problems. You will also receive recommendations for additional skills, training, and support that can help individuals and organizations effectively learn about and adopt quantum technology.

KEY CONCEPTS Annealing quantum computing | Gate-model quantum computing

02

BEGINNER

Getting Started with Applied Quantum Optimization

Quantum-powered optimization can help address many important business problems more efficiently while delivering higher-quality solutions. This course equips learners with the knowledge and tools to complete the first steps in developing a quantum application: problem discovery and problem description.

Learners will be able to identify problems that can benefit from D-Wave's quantum-classical hybrid technology and then describe those problems in a way that allows developers to model them. These skills are crucial for the success of quantum optimization projects.

This beginner-level course is appropriate for any stakeholder involved in identifying and shaping optimization use cases for quantum computing.

KEY CONCEPTS Annealing quantum computing | Problem description | Problem discovery

03

INTERMEDIATE

Problem Formulation for Applied Quantum Optimization

This course equips learners with the knowledge and skills to complete the problem formulation step in developing quantum applications. Learners will be able to develop mathematical models of optimization problems that are suitable for solving with D-Wave's Stride hybrid solver.

KEY CONCEPTS Annealing quantum computing | Problem formulation | Stride hybrid solver

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04

INTERMEDIATE

LEAP ACCESS INCLUDED

OFFICE HOURS INCLUDED

Implementation of Applied Quantum Optimization Models

This course equips learners with the knowledge and skills to complete the software implementation and testing steps in developing quantum applications. Learners will be able to code mathematical formulations of optimization problems for D-Wave's Stride hybrid solver. Learners will also be able to validate optimization models, interpret solver outputs into business terms, and use key performance metrics to evaluate comparable models.

KEY CONCEPTS Annealing quantum computing | Stride hybrid solver

05

BEGINNER

Foundations for Quantum Programming

This course is an optional prerequisite for the Quantum Programming Core training. It supports the math and Python skills needed to successfully complete Quantum Programming Core and use D-Wave annealing quantum computers to solve optimization problems. Learners who successfully complete this course will better understand how to determine optimization problem objectives, define problem variables, and represent problems mathematically, graphically, and programmatically.

KEY CONCEPTS Annealing quantum computing | Quadratic unconstrained binary optimization (QUBO)

06

INTERMEDIATE

LEAP ACCESS INCLUDED

OFFICE HOURS INCLUDED

Quantum Programming Core

This comprehensive, hands-on training allows you to put theory into practice with real-world quantum applications. Learners will identify quantum use cases across different application areas, break down optimization problems into objectives and constraints, and formulate optimization problems as quadratic and nonlinear models. This intermediate-level online course is appropriate for individuals who want to work with D-Wave quantum-classical hybrid solvers and explore working directly with the quantum processing unit in an annealing quantum computer.

KEY CONCEPTS Annealing quantum computing | Binary quadratic model (BQM) solver | Constrained quadratic model (CQM) solver | Stride hybrid solver | Quantum processing unit (QPU)

Not sure where to start?

Talk with your D-Wave representative or contact us to identify the training path that best fits your team's goals, experience, and application needs.

Contact Us →

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