

QUANTUM COMPUTING FUNDAMENTALS

Understand quantum computing and how it will transform business in this two-course online program from MIT.

THE QUANTUM COMPUTING REVOLUTION IS UPON US

Like the first digital computers, quantum computers offer the possibility of technology exponentially more powerful than current systems. They stand to change companies, entire industries, and the world by solving problems that seem impossible today.

A recent report by Gartner states that by 2023, 20% of organizations will be budgeting for quantum computing projects. As this new technology develops, organizations will face a shortage of quantum computing experts.

The time to learn about quantum computing is now. Discover the business and technical implications of the new frontier in computing and how you can apply them to your organization with this two-course program from MIT.

WHO SHOULD ENROLL

- Professionals and leaders in business, government, and technology that need to get an understanding of the business and technical implications of quantum computing.
- Any interested participant with basic knowledge of vector and matrix multiplication as linear algebra is at the core of quantum computing algorithms.

AFTER THIS PROGRAM, YOU WILL BE ABLE TO:

- Describe the differences between quantum and classical computation.
- Discern potential performance gains of quantum vs. classical algorithms.
- Assess the business applications of quantum computation.
- Understand engineering challenges currently faced by developers of quantum computers.
- Become proficient with engineering requirements for quantum vs classical algorithm implementation.
- Discern the scientific limits of quantum algorithms for chemistry and optimization.
- Determine technical requirements for quantum computers to run realistically large quantum algorithms.
- Evaluate key technology requirements for quantum computers to be able to function properly.
- Understand the mathematical description of quantum states and basic quantum operations.

TRANSFORM YOUR WORKFORCE

Deepen your team's career knowledge and expand their abilities with MIT xPRO's online programs for professionals.

Contact MIT xPRO Director of Partnerships Franklin Mathieu at fmathieu@mit.edu or 617-258-9747.

DURATION

4 weeks per course

TIME COMMITMENT

4-6 hours per week

PRICE

\$2,149

QSEC
member discounts
available

FORMAT

Online

CEUs

4

QUANTUM COMPUTING REALITIES

Dive deeper into the practical applications of quantum computing in this two-course program from MIT.

THE QUANTUM COMPUTING REVOLUTION IS UPON US

Like the first digital computers, quantum computers offer the possibility of technology exponentially more powerful than current systems. They stand to change companies, entire industries, and the world by solving problems that seem impossible today.

A recent report by Gartner states that by 2023, 20% of organizations will be budgeting for quantum computing projects. As this new technology develops, organizations will face a shortage of quantum computing experts.

The time to learn about quantum computing is now. Understand the true possibilities and advantages of quantum computing while getting hands-on experience in this two-course online program.

WHO SHOULD ENROLL

- Technical professionals, scientists, and researchers.
- Professionals and leaders in business, government, and technology that need to get a better understanding of the practical realities of quantum computing.
- Any interested participant with basic knowledge of vector and matrix multiplication as linear algebra is at the core of quantum computing algorithms.

AFTER THIS PROGRAM, YOU WILL BE ABLE TO:

- Familiarize with the practical tradeoffs between trapped ion and superconducting qubit implementations of quantum computers.
- Gain proficiency with the typical coherence times and quantum gate counts achievable with leading quantum computer implementations.
- Become comfortable with the mathematical description of quantum states and basic quantum operations.
- Evaluate technology options for realizing quantum computers and quantum communication systems using atoms, photons, and superconductors.
- Describe the conceptual role of fault-tolerance in realizing large-scale quantum and classical computation.
- Gain knowledge of one quantum error correction code, and its code parameters.
- Understand the different strategies for counteracting systematic versus random error in quantum computation.

TRANSFORM YOUR WORKFORCE

Deepen your team's career knowledge and expand their abilities with MIT xPRO's online programs for professionals.

Contact MIT xPRO Director of Partnerships Franklin Mathieu at fmathieu@mit.edu or 617-258-9747.

DURATION

4 weeks per course

TIME COMMITMENT

3-5 hours per week

PRICE

\$2,149

QSEC member discounts available

FORMAT

Online

CEUs

4.5