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Course ID
QC1
Course Duration
2-3 days

Course Title
Quantum Communications Training

Aimed At

Telecommunications and Information Technology (IT) professionals in the public or private sector whose job requires an understanding of the emerging quantum technologies.

Prerequisites

The *Quantum Communications Training* course does not require any prior knowledge of quantum physics or advanced mathematics.

Course in a Nutshell

There is a great deal of misunderstanding about the capabilities and limitations of quantum technologies, both theoretical and practical. There's a concern that quantum computing will make existing communications security protocols obsolete. In this *Quantum Communications Training* course, you will learn the basics of quantum technologies and explore their impact on telecommunications, e.g., PKI.

Course Outline

- *Quantum Communications Training*: Introduction
  - Quantum technology, computing, and communications
  - Advantages and challenges
  - State-of-the-art: Technology and players
- *Quantum Communications Training*: Physics and Math
  - Basics of quantum physics
  - Mathematical techniques
  - Computation using Mathematica
  - Qubits and how they work
- *Quantum Communications Training*: Main Problems to Be Solved
  - Telecommunications
    - Secure communication
    - Problems with PKI
  - Computing
    - Solving certain problems faster than is possible with conventional computers
    - Factoring large numbers and breaking PKI
- *Quantum Communications Training:* Relationship of Quantum Computing and Quantum Telecommunications
- *Quantum Communications Training:* Quantum Telecommunications Basics
  - Conventional encryption methods, strengths, and weaknesses
  - Quantum concepts vis-à-vis information transmission
  - Secure key transmission

  - Secure data transfer
  - Basics of quantum computers
- *Quantum Communications Training:* Breaking PKI
  - Shor algorithm
  - Supercomputers
- *Quantum Communications Training:* Current State of Quantum Technology
  - Telecommunications
  - Computers
- *Quantum Communications Training:* Limitations of Quantum Technology
  - Problems amenable to solution
  - Problems that are not suitable
- *Quantum Communications Training:* Conclusion
  - Course recap
  - Future outlook

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