Facultatea de Automatică şi Calculatoare
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Universitatea Politehnica Timişoara

Master's Degree Program
Quantum Computing

General Information

Requirements:	Bachelor's degree; fundamentals of Computer and Software Engineering
Duration:	4 semesters (3 semesters coursework + 1 semester Dissertation thesis)
ECTS credits:	120
Program language:	English
More information:	https://cs.upt.ro/education/master

Competencies and Knowledge Acquired

- Advanced understanding of the main subjects in quantum computing and quantum communication.
- Acquaintance with current quantum technologies that foster the development of quantum computing projects.
- Skills to analyze the state-of-the-art, innovate, and research.
- Communication abilities, interdisciplinary cooperation propensity, and team project management.

Curriculum

This program's curriculum is simple, flexible, and encompasses three parts:

- **Core** – each semester, at least 2 courses must be elected out of the following:
  - Semester 1: *Mathematics for Quantum Computing, Fundamentals of Quantum Physics, Introduction to Quantum Computing, Cyber Physical Systems.*
  - Semester 2: *Quantum Information Theory, Advanced Cryptosystems, Quantum Circuit Design and Error Correction, Fault Diagnosis and Design for Testability.*
  - Semester 3: *Quantum Communications and Cryptography, Quantum Algorithms and Programming, Quantum Applications in the Real World, Dependable and Secure Computing.*
- **Elective** – each semester, 1 course must be elected out of the course list of ***any*** *Master's program in the field of Computer and Information Technology.*
- **Research** – develops the research skills of the Master's student over the four semesters of the program. It contains courses and activities directly related to research and Master Thesis development.

Why Master of Quantum Computing

- Quantum computing is a promising new computational paradigm inching closer to real-world applications.
- Because of its inherent capacity to process quantum states, quantum computing can solve hard computational problems relevant to molecular science, nanomaterials, complex systems, and cryptography.
- Quantum computing systems boost current applications in machine learning and cryptography.
- Quantum Key Distribution (QKD) is the only unconditionally secure key growth protocol.
- Don't miss out on the quantum revolution in all computer science and engineering aspects!
- Learn new concepts in the most exciting emerging field of science and engineering.
- This may be the first step toward a successful research career in academia or industry.

Benefits and Opportunities

- Currently, quantum technologies demand a massive workforce, meaning such jobs are highly paid.
- There is a big professional opportunity to participate in ushering in a disruptive computational technology.
- Well equipped laboratories, good infrastructure, including the latest quantum technologies.

Contact

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