الجمهورية الجزائرية الديمقراطية الشعبية
وزارة التعليـم العالـي والبحـث العلمي
جامعـة فرحات عباس- سطيـف 1

Thematic Network of Quantum Computing
Setif 1 - Boumerdes - Constantine 2 - Bejaia - Tebessa - Bouira

Setif 1 Univ - Frhat ABBAS

Faculty of Sciences

Master's degree in QUANTUM COMPUTING

Presentation and objectives of the Speciality:

This Master's program offers comprehensive training in Quantum Computing, enabling students to understand fundamental concepts .

1 - Develop a deep understanding of quantum theory
2 - Gain proficiency in quantum programming to translate classicval problems into quantum algorithms and optimize them
3- By Exploring quantum hardware and technologies, students will gain hands-on experience with various technologies, including superconducting qubits.
4 - Investigate quantum applications and use cases Prepare for careers in quantum computing including software engineering, algorithm design, information theory, and consulting methods.

Access conditions:

All Licence degree in Computer Science.

Career prospects/professions:

- Research and Development scientist (R&D scientist)
- Quantum software engineer
- Quantum hardware engineer
- Quantum security specialist (cryptography, cyber-security)
- Development of new medicines.
- Impact on energy and environment
- Meteorology
- Logistics......

Organization of studies and official duration of the program:

■ Semester 1

Subject 1: Quantum Mechanics
Subject 2: Advanced Linear Algebra
Subject 3: Algorithms and Parallel Architectures
Subject 4: Advanced Algorithms and Complexity
Subject 5: Artificial Intelligence
Subject 6: Advanced Networking
Subject 7: Nano electronics
Subject 8: English

■ Semester 2

Subject 1: Quantum Computing and Algorithms
Subject 2: Programming language for quantum computing
Subject 3: Building Quantum Computer
Subject 4: Cryptology
Subject 5: Advanced Probabilities
Subject 6: Unix System Administration
Subject 7: Spintronics
Subject 8: English

■ Semester 3

Subject 1: Quantum Cryptography
Subject 2: Quantum Error Correction
Subject 3: Machine Learning
Subject 4: Simulation and Optimization
Subject 5: Applied Quantum Computing
Subject 6: Formal Methods for Quantum Computing
Subject 7: Entrepreneurship
Subject 8: Research Methodology

■ Semester 4

Project / Stage

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