

### **General Program Description:**

The Bachelor of Science in Fundamental Chemistry is part of the academic field of Material Sciences. It provides a solid scientific foundation in chemistry, physics, and mathematics with a strong emphasis on theoretical knowledge and laboratory skills. This program aims to prepare students for advanced studies (Master's/Ph.D.) or technical positions in research, education, and industry.

The curriculum is structured to develop analytical thinking, problem-solving abilities, and practical expertise through progressive learning of chemical principles, experimental techniques, and computational methods.

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### **Program Objectives and Competencies:**

Develop deep understanding of chemical processes, structure of matter, thermodynamics, kinetics, and quantum chemistry.

Gain proficiency in laboratory techniques and instrumental analysis.

Master scientific communication, including technical writing and presentations.

Prepare students for careers in academic research, teaching, or chemical industries.

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### **Admission Requirements:**

#### **Eligibility:**

High school diploma (Baccalaureate) in Science, particularly Mathematics or Experimental Sciences tracks.

Strong foundation in physics, chemistry, and mathematics.

#### **Admission Procedure:**

Application through the national platform with academic transcripts.

Selection based on academic performance, especially in science subjects.

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### **Program Structure:**

Duration: 3 years (6 semesters)

Total Credits: 180 ECTS

Components per Semester:

Fundamental Courses (UEF)

Methodological Units (UEM)

Discovery Units (UED)

Transversal Skills (UET – e.g., Languages)

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**Core Subjects (Examples):****Year 1 (Semesters 1 & 2):**

Mathematics 1 & 2 (Analysis & Algebra)

Physics 1 & 2 (Mechanics, Electricity)

Chemistry 1 & 2 (Structure of Matter, Thermodynamics & Chemical Kinetics)

Computer Science 1 & 2 (Office Tools, Programming Languages)

Laboratory Work: Mechanics, Chemistry, Electricity

Discovery Topics: Environment, Biotechnology, History of Science

Foreign Languages: English or French

**Year 2 (Semesters 3 & 4):**

Inorganic Chemistry, Organic Chemistry 1 & 2

Applied Mathematics, Vibrations, Waves & Optics

Quantum Chemistry, Analytical Chemistry

Numerical Methods & Programming

Physico-Chemical Analysis Techniques

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**Specialized Subjects (Year 3 – Semesters 5 & 6):**

Organic Chemistry III

Analytical Chemistry II

Crystallography

Quantum Chemistry II

Solution Thermodynamics

Electrochemistry

Molecular Spectroscopy

Surface Chemistry & Catalysis

Materials Chemistry / Macromolecular Chemistry

Environmental Chemistry / Therapeutic Chemistry

Laboratory Practicals: Organic Synthesis, Analytical Chemistry, Crystallography, Electrochemistry

English for Science, Ethics & Deontology

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**Career Opportunities:**

Laboratory Technician / Analyst

Assistant roles in research institutions or industrial labs

Positions in chemical, pharmaceutical, materials, and environmental sectors

Entry to Master's programs in Chemistry, Materials Science, or Environmental Sciences.

**Language in which the training is provided:**

The Fundamental Chemistry bachelor's degree is predominantly taught in French; however, in recent years, certain subjects or parts of them have been offered in English.