

Contacts

Location

UNIVERSITÉ DE PAU
ET DES PAYS DE L'ADOUR

College of Sciences and Technology
for Energy and Environment

Pau Campus - France

Coordinator

beatrice.lauga@univ-pau.fr

More information

[https://formation.univ-pau.fr/
m-csv-mbem](https://formation.univ-pau.fr/m-csv-mbem)

Admission Office

master.programs@univ-pau.fr

How to apply

The application documents must be
uploaded on the website:

<https://ri.univ-pau.fr/m-programs>



Admission requirements

Academic requirements

Applicants must hold a first year of a Master's degree or Diploma equal to BAC+4 from a European university (minimum of 240 ECTS credits) in Biology or Science.

English Language Requirements

Minimum required score: CECRL B2 level in English

Detailed Program Facts

Level: Master's degree

Academic Year: Our full academic year runs from September to July

Application: Applications are open from November to March 31st

Program intensity: Full-time

Duration: 1 year

Credits: 60 ECTS

Language: Fully taught in English

Key assets:

- Open to a Work and Study Program.
- Dual degree with the "Master in Biotechnology of Environment and Health" from the University of Oviedo (Spain).

**Master's
degree**
IN CHEMISTRY
AND LIFE SCIENCES

**Molecular Biology
and Environmental
Microbiology**

Open to
a Work and Study Program
Dual degree with the University
of Oviedo in Spain

Conception - Direction de la communication - Impression : Centre de reprographie - UPPA - Septembre 2024



<https://formation.univ-pau.fr/m-csv-mbem>

Overview

Increasingly strong societal demand in the fields of the Environment, sustainable development and health now calls for a synergy of cutting-edge skills involving Chemical and Biological Sciences.

The Molecular Biology and Environmental Microbiology Master's degree is at the heart of this technological and socio-economic evolution. At a meeting point of **applied and fundamental research** in a region that is home to large-scale facilities of several industrial companies concerned by bio-depollution (Total, Arkema, chemical industries at the Lacq site) and a strong agricultural activity, the MBEM Master's degree offers a training program that allows to meet these new challenges. Biological methods developed for the remediation of contaminated sites, the treatment of effluents, the control of the use of pesticides or the search for pathogens in natural or artificial environments are increasingly in demand and proposed as necessary alternatives for the sustainable improvement of environmental problems. The implementation of these methods as well as the development of molecular analysis tools and techniques (quantitative PCR, DNA chips, highthroughput sequencing, bio-informatics analysis, microbial biosensors, GMOs, protein engineering) and the need to **understand and anticipate the impact of global changes on the functioning of ecosystems** constitute today challenges for industrial and environmental policies.

Student Learning Outcomes

The theoretical, methodological and practical teaching must lead students to acquire the necessary bases for effective integration into the world of business or research, but also for communication with representatives of the socio-professional world. The 2nd year of the Master includes:

- Theoretical and practical teaching by teacher-researchers, conferences with professionals from the sector and visits to companies,
- An internship of 4 to 6 months in a company, a professional organization or a research laboratory.

The courses are oriented towards the acquisition of scientific and technical skills as well as knowledge of professional concerns so that students can be operational to meet the demands of the sector but also be a source of innovative perspectives in the context of the missions they will be assigned. During the first semester, the emphasis is placed on carrying out personal work, in small groups, covering bibliographical research and analysis of articles in the field of expertise, writing scientific papers, oral presentations, lab work including the development, implementation and analysis of the results of an experimental protocol.

Opportunities

Sectors

- Environment
- Agribusiness
- Biotechnology
- Life sciences

Fields

- Research and Development
- Quality control

Positions

- Academic positions
- Researchers (public or private)
- Research and Innovation Engineers

University class of 2020
67% pursuing their studies
33% in employment (2020)

Program objectives

At the end of this course, graduates will have an overview of trends and challenges in environmental microbiology and will develop the following skills according to their choice of optional courses:

- Identify the concepts and approaches of modern microbiology and biology,
- Understand the complexity and importance of microbial processes in the environment,
- Master modern biochemical, molecular and genetic methodologies, as well as mathematical, statistical and computer tools,
- Search for pathogens in natural environments and industrial installations or select micro-organisms degrading contaminants of biotic or abiotic origin in the laboratory or in the natural environment,
- Conduct experiments to evaluate the effectiveness of biological or chemical methods of environmental remediation,
- Conduct studies and formulate opinions to solve practical problems posed by the protection of ecosystems: assessing the benefit-risk of the methods used, setting up field study protocols,
- Master the tools of statistical analysis and integrating the knowledge necessary to respect the environment within the framework of sustainable development,
- Conduct field experiments to evaluate the effectiveness of chemical or biological methods for the protection of eco- and agrosystems.

Semestre 1 (195h - 285h)

Language - Mandatory

- English or French as a Foreign Language

Data analysis - Mandatory

- Statistical tools-project

Molecular biology and environmental microbiology

Mandatory

- Molecular biology technological applications
- Microbial biotransformations and environmental applications

Optional

- Molecular ecology
- Trends and challenges in microbiology

Quality - Optional

- Quality assurance for analysis

Environmental Chemistry - Optional

- Trace element biogeochemical cycles
- Speciation concepts and analysis
- Biological Macromolecules Characterization
- Imaging techniques for environmental samples and materials characterization

Group project - Optional

- Environmental engineering project

Semestre 2 (4 to 6 months)

Mandatory

- Internship
- Bibliographic research