



SCIENCE, TECHNOLOGY, HEALTH

M2 Molecular Biology and Environmental Microbiology



ECTS
60 credits



Duration
1 year



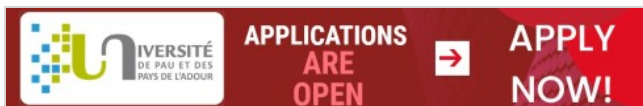
Component
Collège
Sciences et
Technologies
pour l'Energie et
l'Environnement
(STEE)



Language(s)
English

Presentation

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



The Master's degree in **Molecular biology and Environmental Microbiology** trains specialists with a mastery of modern **molecular biology** and **environmental microbiology**, with a solid background in **chemistry**, capable of grasping environmental issues related to:

- * The protection of **ecosystems**,
- * The ecotoxicology of soils, sediments, and water,
- * The identification of microorganisms representing a risk to the environment or public health,
- * The bio-rehabilitation of sites affected by anthropogenic (industrial and agricultural) pollution.

The **Molecular Biology and Environmental Microbiology** Master's degree is at the heart of this technological and socioeconomic evolution. At a meeting point between the professional world and the University in a region that is home to large-scale facilities of several industrial

companies concerned by bio-decontamination (Total, Arkema, chemical industries at the [Lacq site](#) | 🇫🇷) and strong agricultural activity.

Biological methods developed for the remediation of contaminated sites, the treatment of effluents, the control of the use of phytosanitary products, or the search for pathogens in natural waters and cooling or water distribution systems are increasingly in demand and proposed as necessary alternatives for 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, high-throughput sequencing, bioinformatics analysis, microbial biosensors, GMOs, and protein engineering) is one of the challenges for industrial and environmental policies in the coming years.

An orientation toward research may be envisaged, depending on the choice of options and especially internships.

Objectives

Taught in English, the first semester is devoted to theoretical and practical teaching by teacher-researchers, supplemented by conferences in which professionals from the sector share their experience in the field, as well as



visits to companies. The course is mainly taught through project-based scenarios.

The second semester consists of an internship of 4 to 6 months in a company, a professional organization, or an academic research laboratory.

Your university

Skills

At the end of this course, graduates 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 bioinformatic tools,
- * Search for pathogens in natural environments and industrial installations or select micro-organisms likely to degrade 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,
- * Conduct field experiments to evaluate the effectiveness of chemical or biological methods for the protection of eco- and agrosystems.

Additional information

Key assets

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

Scholarships

- * Region Aquitaine Scholarships for non-EU students
- * EIFFEL Scholarship of Excellence
- * Specific Master's scholarship

The International Master Programs Admission Office

master.programs@univ-pau.fr

Organisation

Organization

SEMESTER 1 from September to January		
Mandatory courses		
Field	Course	ECTS
Language	English or French as a Foreign Language	2
Data analysis	Statistical tools-project	4
Molecular biology and environmental microbiology	Molecular Biology Technological applications (EC3) (6.0 crédits ECTS) Microbial biotransformations and	6 2 4



	<p>environmental applications - conferences (EC1) (2.0 crédits ECTS)</p> <p>Microbial biotransformations and environmental applications - project (EC2) (4.0 crédits ECTS)</p>	
	Electives: choose for 10 ECTS	ECTS
Quality	Quality assurance for analysis	2
Environmental Chemistry	* Trace element biogeochemical cycles	2
	* Speciation concepts and analysis	2
	* Biological Macromolecules Characterization	2
	* Imaging techniques for environmental samples and materials characterization	2

Ecology	Molecular Ecology (2.0 crédits ECTS)	2
Biotechnology	Champignons et biotechnologie (2.0 crédits ECTS)	2
Water	Water treatment: Lab work on Biological water treatments (EC3) (2.0 crédits ECTS)	2
Health	Environment Health Safety (2.0 crédits ECTS)	2
Group project	Environmental engineering project	4



SEMESTER 2 From January to June		
Fields	Course title	ECTS
Internship	- Internship	20
Bibliography	- Bibliographic research	10

Assessment method

- * Final exams
- * Ongoing assessments
- * Oral presentations

Admission

Admission requirements

Academic requirements

Applicants must hold at least a 4-year university level in chemistry and/or biology fields.

The M2 MBEM is open to students who have completed an M1 (4-year degree) in "Molecular Biology and microbiology for the environment" (BME) or an equivalent level.

For students outside the UPPA, integration in the second year is subjected to a selection of curricula with equivalent training levels and sufficient skills in biology, chemistry, and environment (Molecular biology, bioinformatics, microbiology, environmental microbiology, ecotoxicology, biostatistics, field sampling, and data processing, physical-chemistry, analytical chemistry, environment).

English Language Requirements

Applicants must be fluent in English, both in writing and speaking. An applicant whose native language is not English has to take a recognized international English test.

Minimum required score: CECRL B2 | 🗣️ level in English

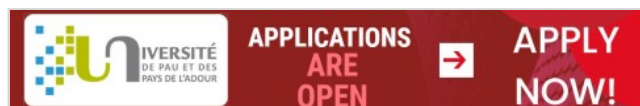
French Language Requirements

None: French language courses are included in the formation.

For any additional information or questions related to the application, please contact:

beatrice.lauga@univ-pau.fr

How to apply



Tuition Fees and partial exemptions

Administrative tuition in France is determined at a national level. The French Ministerial Order of April 19, 2019, amended on June 9, 2020, sets university tuition for a Master's Program as follows: European nationals: **€243**, extra-European nationals: **€3770**.

For the academic year 2022-2023, the Board of Directors has extended its policy of automatically providing a **partial reduction of these fees at the UPPA**. As a result, extra-European nationals will be granted automatic partial reductions such that **they will be able to pay the same enrollment fees as European nationals**.

Extra fees:

In addition to academic tuition, most students must pay a student body fee (CVEC, which cost €92 in 2020-2021).



NB: Admitted candidates in any course of study who have taken a break of more than two years from their studies will enroll via the UPPA's **Continuing Education service** (Formation Continue / FORCO). They are exempt from the CVEC, however, they may be subject to a different tuition scale.

Student capacity

15

And after

Further study

Sectors

- * Environment
- * Agribusiness
- * Biotechnology
- * Life sciences

Fields

- * Research and Development
- * Quality control

Positions

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

Useful info

Contacts

Béatrice LAUGA

✉ beatrice.lauga@univ-pau.fr

Partner laboratories

IPREM

🔗 <https://iprem.univ-pau.fr/fr/index.html>

Place

📍 Pau

Campus

🏠 Pau