



SCIENCE, TECHNOLOGY, HEALTH

# M2 Chemical and microbiological characterization for environmental issues

Master Chemistry and Life sciences



ECTS  
60 credits



Duration  
1 year



Component  
Université de  
Pau et des  
Pays de l'Adour  
(UPPA)



Language(s)  
English

## Presentation

[Apply here from October to March](#)

Strongly increasing societal demand in the fields of Environment, Sustainable Development, and Health, implies a synergy of advanced skills in Chemistry and Biology Sciences. To be able to effectively respond to this demand and to implement innovative solutions providing efficient answers to these requests, it is essential to perfectly understand the interaction of contaminants with living organisms and particularly their structures, properties, reactivities/activities in natural ecosystems.

The "**Chemical and Microbiological Characterization for Environmental Issues**" (CMCEI) second-year course of the Master in Chemistry and Life Sciences aims to train specialists with knowledge of the most recent advances in analytical chemistry, physics-chemistry, molecular biology, and environmental microbiology.

## Objectives

Entirely taught in English, the first semester is devoted to the knowledge of contaminants cycles and to the application of different techniques for the analysis of chemical elements and species of interest in various

compartments of the environment, the identification of microorganisms presenting a risk to the environment or public health, but also quality assurance, critical evaluation of scientific publications and /or technical documentation.

The second semester consists of an 18- to 24-week research placement in the field of chemical and/or biological analysis applied to the environment in IPREM teams.

The course is mainly taught through project-based scenarios which help students understand the scientific approach in research. It also makes them put into practice various techniques and reflect further on their professional project.

## Your university

## Skills

At the end of this program, the students in the **«Chemical and Microbiological Characterization for Environmental Issues Master»** will be able to:

- \* Show expertise in modern techniques in chemistry, molecular biology, and microbiology
- \* Synthesize technical and research documentation to produce a technical study



- \* Plan and define a research or R&D project in analytical chemistry, molecular biology, microbiology, or environmental survey
- \* Manage and carry out a project
- \* Manage field experiments to estimate the efficiency of chemical or biological methods for the protection of the ecosystems
- \* Interpret and validate results of chemical and biological analysis
- \* Produce a summary report describing the experiments done, the applied methods used, and the results obtained

## Additional information

### Scholarships

- \* [EIFFEL Scholarship of Excellence](#)
- \* [Talents' Academy Grants](#) | 
- \* [Catalogue des Bourses Campus France](#) | 

### The International Master Programs Admission Office

[master.programs@univ-pau.fr](mailto:master.programs@univ-pau.fr)

## Organisation

### Organization

SEMESTER 1		
from September to January		
Field	Course	ECTS
Language	English or French as	2

	a Foreign Language	
Data analysis	Statistical tools project	4
Molecular biology and environmental microbiology	- Molecular Biology Technological applications (EC3) (6.0 crédits ECTS)  - Microbial biotransformation and environmental applications - conferences (EC1) (2.0 crédits ECTS)  -Microbial biotransformation and environmental applications - project (EC2) (4.0 crédits ECTS)	6  2  4
Quality	Quality assurance for analysis	2
Environmental Chemistry	- Trace element biogeochemical cycles  - Speciation concepts and analysis	2  2  2



	<ul style="list-style-type: none"> <li>- Biological Macromolecules Characterization</li> <li>- Imaging techniques for environmental samples and materials characterization</li> </ul>	
Ecology	Molecular Ecology (2.0 crédits ECTS)	2
Analytical chemistry	<ul style="list-style-type: none"> <li>- Analytical methods performances evaluation (2.0 crédits ECTS)</li> <li>- Advanced analytical chemistry : organic contaminants analysis (EC1) (2.0 crédits ECTS)</li> <li>- Advanced analytical chemistry : electrochemical sensors (EC2) (2.0 crédits ECTS)</li> <li>- Advanced analytical chemistry : Advanced spectrometric techniques</li> </ul>	2

	<ul style="list-style-type: none"> <li>coupling (EC3) (2.0 crédits ECTS)</li> <li>- Advanced analytical chemistry :Advanced separation techniques (EC4) (2.0 crédits ECTS)</li> </ul>	
Research tools and applications	<ul style="list-style-type: none"> <li>- Environmental engineering project</li> <li>- Scientific papers and documentation critical evaluation (2.0 crédits ECTS)</li> </ul>	4 2

SEMESTER 2		
From January to June		
Fields	Course title	ECTS
Internship	Internship	30

## Trainings

**Internship** : Mandatory

**Internship duration** : 6 months



# Admission

## Admission requirements

### Academic requirements

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

The **M2 CMCEI** is open to students who have completed an M1 (4-year degree) in "**Chemistry and Life sciences**" (SAVE), "**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).

# Graduate Program Green - Environmental Analytical Chemistry and Microbiology

*In 2022-2023, the UPPA is opening a 5-year integrated Master's/PhD program*

*that provides research-intensive training in multiple fields, called the Graduate Program GREEN (GRaduate school for Energetic and Environmental iNnovation). Several courses of study taught entirely in English are part of this program. The Graduate Program GREEN is open to high-potential students from a variety of scientific backgrounds who have completed their undergraduate training with the highest honors. To be selected, candidates must explicitly indicate in their letters of motivation their desire to integrate the Graduate Program GREEN, providing reasons for why they wish to participate in this research-focused PhD-Track.*

### 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:**

✉ [florence.pannier@univ-pau.fr](mailto:florence.pannier@univ-pau.fr)  
or [christine.cagnon@univ-pau.fr](mailto:christine.cagnon@univ-pau.fr)



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## How to apply

Apply here from October to March

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## Tuition Fees and partial exemptions

Go to the [Tuition fee page](#) | 

*The school partially exempts non-EU students from the differentiated fees for initial training enrolling in the Master's program.*

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## And after

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### Professional insertion

#### Sectors

- \* Environment
- \* Agribusiness
- \* Analytical Chemistry
- \* Chemical industries
- \* Biotechnology

#### Fields

- \* Research and Development, quality control

#### Positions

- \* Academic positions
- \* Researchers (public institutes or private companies)
- \* Research and Innovation Engineers
- \* Ph.D. students

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## Useful info

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### Contacts

#### Head of Studies

Florence PANNIER

✉ [florence.pannier@univ-pau.fr](mailto:florence.pannier@univ-pau.fr)

#### Head of Studies

Christine CAGNON

✉ [christine.cagnon@univ-pau.fr](mailto:christine.cagnon@univ-pau.fr)

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### Place

 Pau

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### Campus

 Pau

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### Know more

Collège STEE Sciences et Technologies pour l'Energie et l'Environnement

🔗 <https://formation.univ-pau.fr/fr/colleges/college-stee.html>