FIELD
Science, technology, health

Course suitable for:
- Continuing education
- Recognition of prior learning
- Initial education

How to apply:
Apply on-line, for initial or continuing training, from mid-April on the UPEM website www.u-pem.fr, "Applications" heading. Apply on-line via the e-applicant application, open at the beginning of March, on the UPEC website at: https://candidatures.upec.fr/candidatures/stylesheets/welcome.faces Specific procedure for foreign students living in a country with the CEF (Centre for Studies in France) procedure: http://www.campusfrance.org/fr/

Course venue:
The teaching of the Master's 1 and Master's 2 core curriculum is shared between the UPEM (Lavoisier Building, rue Galilée, 77420 Champs-sur-Marne) and the UPEC (Faculty of Science and Technology, 61 Avenue du Général de Gaulle, 94010 Créteil).

Contacts:
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Calendar:
Academic year starts: end September or beginning October in M1 and M2
Academic year ends: end June in M1 and end September in M2
M2 internship starts: end February

For further details:
Information, Career guidance and Professional integration Department
(SIO-IP): sio@u-pem.fr / +33 1 60 95 76 76
www.u-pem.fr/formations/774

ENTRY REQUIREMENTS
Bachelor's degree majoring in Chemistry, Chemistry-Physics or Chemistry-Biology. The M2 MPCA course is automatically open to students who have passed the M1. Selection by application for M2 applicants with another M1, an engineering degree or an equivalent foreign degree in chemistry, physics, the environment or planetary science.

ACQUIRED SKILLS

The course provides a broad knowledge base on the structure of matter in relation to its reactivity. It deals with the synthesis routes and the reactivity of molecular species in natural environments, namely the Earth, the planets and the astrophysical systems. It demonstrates the role of species in the pollution of all the environments: air, water and land, provides examples of experiments using cutting-edge technology in physical chemistry, addresses the subject of waste and industrial pollution and provides an understanding of the law and the environmental standards and the business world. It also provides an evaluation of the chemistry digital simulation software most frequently used in laboratories and in the industrial environment.

YOUR FUTURE CAREER

After this Master's degree, graduates can continue their studies with either a PhD or a Specialised Master's, or go to a Teacher Training College for Chemistry, Physics or Physical Chemistry.

BENEFITS OF THE COURSE

One of the aims of the MPCA pathway is to teach top-level scientific skills in multiscale modelling and spectroscopic characterisation of matter with a broad range of applications. This specialism does, in fact, focus on mastering experimental physicochemical experimental methods and the characterisation of molecular species playing a role in the field of chemistry and in related fields such as planetary science (terrestrial and extra-terrestrial atmospheric chemistry, astrochemistry, exobiology, etc.), biochemistry, nanoscience and theoretical and modelling methods and processes for these complex systems. This pathway is both vocationally and research-oriented. The choice will be determined by the nature of the internship, either in industry or in a research laboratory.
STUDY PROGRAM

YEAR 1, SEMESTER 1.
Electrochemistry (ECTS : 3)
Organic synthesis 1 (ECTS : 3)
Business knowledge (ECTS : 3)
English (ECTS : 3)
Spectroscopic methods of analysis (ECTS : 3)
NMR analysis techniques and introduction to MRI (ECTS : 3)
Choice of units: 12 ECTS (4 options to choose)
From macromolecules to polymer materials (ECTS : 3)
Biotechnology and fine chemistry 1 (ECTS : 3)
Biotechnology and fine chemistry 2 (ECTS : 3)
Nanochemistry (ECTS : 3)
Physics and quantum chemistry 1 (ECTS : 3)
Modelling in chemistry (ECTS : 3)
Environmental chemistry (ECTS : 3)
Computer programming 1 (ECTS : 3)

YEAR 2, SEMESTER 4.
Internship (ECTS : 24)
Choice of units: 6 ECTS:
National Label for Theoretical Chemistry (ECTS : 6)
Waste treatment and regulations (ECTS : 6)

YEAR 1, SEMESTER 2.
Separation analysis techniques 1 (ECTS : 3)
Biosourced polymers (ECTS : 3)
Bibliographic project, conference cycle (ECTS : 6)
Internship and conference cycle
Experimental project, conference cycle
English
Surface analysis methods (ECTS : 3)
Colloids (ECTS : 3)
Choice of units: 12 ECTS
Cellular bases pharmacology toxicology 1 (ECTS : 3)
Cellular bases pharmacology toxicology 2 (ECTS : 3)
Separation analysis techniques 2 (ECTS : 3)
Surface chemistry and bio-interfaces (ECTS : 3)
Computer programming 2 (ECTS : 3)
Spectroscopy applications (ECTS : 3)
Modelling complex environments (ECTS : 3)
Physics and quantum chemistry 2 (ECTS : 3)
Organic synthesis 2 (ECTS : 3)
Polymers in solution (ECTS : 3)

YEAR 2, SEMESTER 3.
Compulsory units
Spectroscopies and characterisation methods (ECTS : 6)
Multiscale modelling (ECTS : 6)
Chemical reactivity and kinetics (ECTS : 3)
Physical chemistry of natural diluted environments (ECTS : 3)
Advanced methods in analytical chemistry (ECTS : 3)
Advanced experimental physical chemistry (ECTS : 3)
Project management - Management (Core unit with the other specialisms) (ECTS : 3)
Communication - Databases (Core unit with the other specialisms) (ECTS : 3)

YEAR 2, SEMESTER 4.
Internship (ECTS : 24)
Choice of units: 6 ECTS:
National Label for Theoretical Chemistry (ECTS : 6)
Waste treatment and regulations (ECTS : 6)