

UNIVERSITÉ  
MARIE & LOUIS  
PASTEUR

UFR SCIENCES &  
TECHNIQUES



Département  
**CHIMIE**  
UFR ST

# MASTER IN CHEMISTRY

## APPLIED CHEMISTRY AND ADVANCED MATERIALS

Domaine de formation : Sciences, Technologies, Santé

SITE UNIVERSITAIRE  
UFR ST, Besançon  
[sciences.umlp.fr](http://sciences.umlp.fr)

POINTS ECTS  
120

NIVEAU DE DIPLOME VALIDÉ  
À LA SORTIE  
Bac+5

DURÉE DE LA FORMATION  
Volume horaire global : 805 h

FORME DE L'ENSEIGNEMENT  
En présentiel

FORMATION  
Initiale, continue, alternance

CONTACT  
Scolarité, administration  
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Service Formation Continue et  
Alternance  
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<https://www.umlp.fr/les-formations>

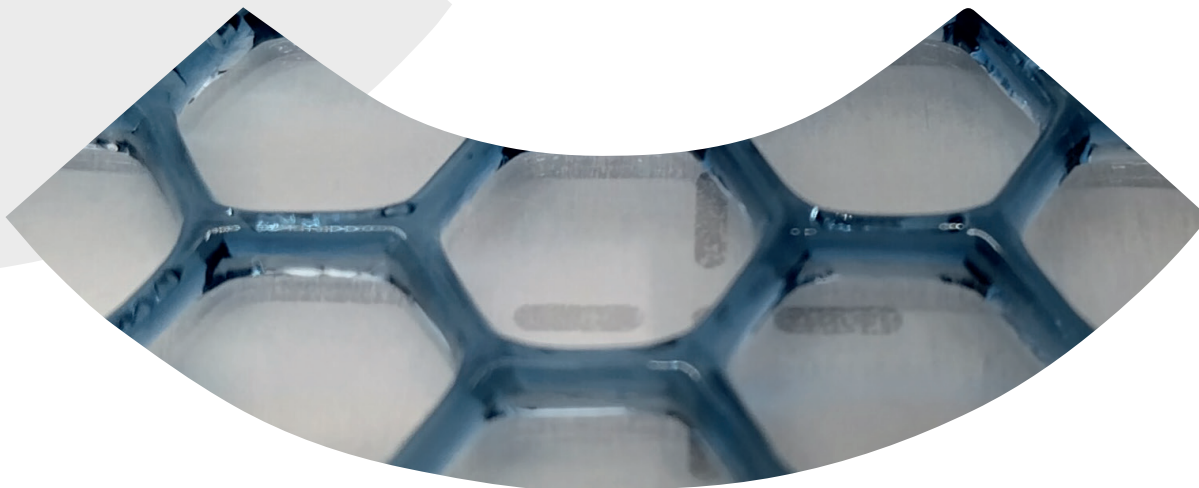
### PRESENTATION AND OBJECTIVES

The Master's degree aims to train specialists in materials science who are capable of contributing to the design and development of new organic, inorganic or hybrid materials and conducting academic or industrial research related to economic and societal issues. Graduates acquire expertise in the development and physico-chemical characterisation of materials and coatings, as well as in their use in key sectors such as energy, the environment, biomedicine, aeronautics and aerospace. Graduates with this degree are tasked with developing new products, innovative solutions and new processes within a research laboratory or a company's R&D department. They take charge of product development and improvement projects, working on the materials involved while considering safety, sustainable development principles and respect for the environment. To do this, they draw on their knowledge of the chemistry and physical chemistry of materials, whether particles, powders or thin films. Trained in the analysis of scientific documents, graduates are a driving force for innovation in the field of materials and participate in both experimental developments and feasibility studies. Drawing on their training in communication, knowledge and skills, these professionals can also lead teams and act as technical advisors to partners and clients.

### SKILLS

The main skills expected at the end of the training program are as follows:

- Participate in an R&D project, designing specifications for the development of a new material;
- Identify appropriate and suitable techniques for developing a material or coating;
- Optimize the development of a material or coating;
- Innovate and develop new materials or coatings;
- Characterize the physical and chemical properties of materials or coatings;



- Adapt the material or coating to the intended application;
- Promote the incorporation of the material or coating into a product for a given application.

## AUDIENCE

Master's 1 in Chemistry, Master's 1 in Materials Science

## ADMISSION AND REGISTRATION

See the admission and registration section on the Marie and Louis Pasteur University website.

## FURTHER STUDIES

Doctorate

## CAREERS

Researchers in higher education; teacher-researchers in higher education; research engineers in higher education; engineers and executives in industry; engineers in charge of management, methods or industrialization; design, research or development engineers in the industrial sector.

## INTERNSHIPS

Initial training : Master's 1: a minimum 3-month internship from March to June, Master's 2: a minimum 5-month internship from February to the end of July.

## COURSES

- Organic electrochemistry, analytical electrochemistry, electrochemistry for surface treatment
- Molecular materials (polymers and biopolymers, assemblies on surfaces)
- Molecular materials for space
- Porous materials
- Divided materials
- Dispersed materials
- Physicochemical characterization
- Characterization of coatings
- Scientific communication