

MASTER MATERIALS SCIENCE AND ENGINEERING

IN BRIEF

Type of diploma : Master degree

Ministry field : Science and Technology

Mention : Sciences et Génie des Matériaux (SGM)

TRAINING CONTENT

The Materials Science and Engineering Master is a general training aiming at giving proper scientific knowledge to students wishing to work in the Materials industry or research. Each course addresses the specific requirements of the socio-economic backgrounds with the support of research activities.

The Materials Science and Engineering Master offers three courses:

ORGANIZATION

- M2 Materials Science and Engineering: Chemistry and Physico-Chemistry of Materials

ORGANIZATIONAL UNIT

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

PLACES

Pau, Tarbes

MORE INFO

Education language :
Fully taught in English

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M2 Materials Science and Engineering: Chemistry and Physico-Chemistry of Materials

PRESENTATION

« Applications are open from December 2018 to April 2019 from <https://aa.e2s.univ-pau.fr/siaap/pub/appele/view/5>

The selection and appropriate use of a material requires chemical expertise that draws on knowledge of the material preparation and characterization sectors, and training in interpretation and modeling of the structural and functional properties of materials. Designed specifically for students taking courses in which chemistry is the predominant subject, the CPCM (Chemistry and Physical Chemistry of Materials) curriculum offers training courses in each of these different sectors. The content of the teaching program is the result of a general synthesis concerning sustainable development and the use of innovative materials that provide a potential response to new requirements and challenges related to energy and the environment.

The teaching program, comprising lectures, supervised and practical work and case studies, is taught by university lecturers and researchers, but also by personnel from the socio-professional sector. The practical work and case studies are done in the laboratories of the Multidisciplinary Research Institute for the Environment and Materials (IPREM CNRS UMR 5254), using high-performance and top-level apparatus. The program also includes modules that prepare students for entering the world of work, use of English in courses and for writing scientific papers, and internships in companies and academic research laboratories.

OBJECTIVES

- * Prepare students at an advanced specialized level to meet present and future challenges in specialty areas in chemistry, polymers, inorganic chemistry and modeling

MORE INFO

ECTS credits : 60

Type of education

- * Initial training
- * Ongoing training
- * Foreign students

Number of students : 25

Internship : Mandatory

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- * Develop engineering research skills to engage in quality and successful research,
- * Prepare students for leading positions in industry and government Research and Development departments.

SKILLS

At the end of this program, the students in the «**Materials Science and Engineering: Chemistry and Physico-Chemistry of Materials master's degree**» will be able to:

- * Prepare materials and samples,
- * Use surface and volume analytical techniques to achieve a sound command of materials characterization,
- * Validate, interpret and model experimental results,
- * Write a synthesis report and communicate appropriately with experts,
- * Produce quality research,
- * Carry out a research project.

ADDITIONAL INFORMATION

TRAINING CONTENT

Teaching, consisting of lectures, tutorials, practical work and projects, is taught by both university research professors and by professionals from the socio-professional world.

Projects and practical works are carried out in the laboratories of the Multidisciplinary Research Institute for the Environment and Materials (IPREM) on high performance equipment. The program also includes preparation modules for professional integration, the practice of scientific English as well as internships in companies as well as in academic research laboratories.

Additionally, the CPCM course offers course units delivered in collaboration with the Universities of Toulouse, Montpellier and Bordeaux as part of the French Theoretical Chemistry Network (RCTF).

Semester 3	
Course Title	ECTS

Materials for energy storage and conversion	4
Materials: nano materials, bio materials and hybrid materials	4
Surface chemistry and interfaces	4
Modelisation of materials with specific properties	4
Optical properties of materials	4
Methods and techniques for polymer-based materials synthesis	4
Natural polymers – biomass valorization (optional)	4
Project management – industrial property and patents (optional)	2
Formulation of adhesives (optional)	2
Theoretical chemistry applied to the study of materials (optional)	4

Semester 4	
Course Title	ECTS
Internship in research in the fields of polymer chemistry, inorganic chemistry, materials,	30

energy, storage and conversion, physical-chemistry, theoretical chemistry

ORGANIZATION

Semestre 3

- *UE Obligatoires (Mandatory)*

- Materials For Energy Storage And Conversion
- Nouveaux matériaux
- Physico chimie des surfaces et des interfaces
- Modélisation des matériaux à propriétés spécifiques
- Propriétés optiques des matériaux
- Anglais spécifique de communication

- *UE Optionnelles (Optional)*

- Procédés et techniques d'élaboration des matériaux à base de polymères
- Polymères naturels et valorisation de la biomasse
- Adhésion et adhésifs
- Chimie théoriques et spectroscopies
- Chimie théorique appliquée à l'étude des matériaux
- Composites à base de nanomatériaux
- Composites et nanomatériaux : Nanomatériaux
- Réalités industrielles

Semestre 4

- *UE Obligatoires (Mandatory)*

- Iniation à la recherche en laboratoire: parcours recherche
- Stage en laboratoire: parcours recherche
- Stage en industrie: parcours pro

ACCESS CONDITIONS



Applications are open from December to April from <http://aap.e2s-uppa.eu>

ADMISSION 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.

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

TUITION FEES

- * Region Aquitaine Scholarships for non-EU students
- * E2S Talent's Academy Scholarships for all students
- * Master's scholarships

PROFESSIONAL INSERTION

Sectors:

- * Chemistry
- * Energy (photovoltaic, batteries, fuel cells, artificial photosynthesis ..)
- * Environment (non-polluting materials, pollution control materials and storage...)
- * Aeronautics (composite materials, surface treatments ...)...
- * Building (thermal and sound insulating coatings ...)
- * Cosmetics & life science

Fields:

- * Research and Development

Positions:

- * Research and Innovation Engineer, PhD students
- * Project Manager
- * Senior manager in design and development (design engineer)

- * Senior manager in production (process engineer, production engineer)
- * Senior manager responsible for quality operations or even production management
- * Technical Director (R & D)
- * Teacher-researcher (possible at the end of a doctorate.)

ORGANIZATIONAL UNIT

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

PLACES

Pau

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