

MASTER'S DEGREE IN MATERIALS SCIENCE AND ENGINEERING

UNIVERSITÉ PSL

The Master in Materials Science and Engineering (MSE) from Université PSL provides the experimental and theoretical knowledge required to conceive and design the materials of tomorrow, improve the performance of existing materials and predict their lifespan. Co-sponsored by the Ecole nationale supérieure de Chimie de Paris – PSL, the Ecole nationale supérieure des Mines de Paris – PSL and ESPCI Paris – PSL, this program aims to establish a link between the processes of development, synthesis and layout, (micro) structures and structural and/or functional properties of various materials such as polymers, metal alloys, ceramics and biomaterials.

MAIN ASSETS

- **Core knowledge** in the materials field.
- **Specialization via 3 tracks** to choose from: Mechanics of Materials for Engineering and Structural Integrity (MAGIS) ; Materials of the future – Design and Engineering (MADI) ; Microfluidics.
- **Multidisciplinary teaching:** chemistry, physical chemistry, physics, mechanics, etc.
- **Multi-scale** from molecules or crystal structures to objects and multi-material approach (metal alloys, polymers, oxides, ceramics, biomaterials, etc.).
- **International opportunities** with some courses taught in French and English (MAGIS and microfluidics).
- **Training in innovation through research:** at least an internship of 6 months is required during the 2 years of the program, to be performed in various research, academic and industrial groups.
- **Industry partners** will lead classes and conference cycles, carry out site tours and hold internships.

RESEARCH

This Master's program is training for and via research. It builds on the existing research themes at Université PSL in the field of materials science. The courses offered are directly linked to the research topics developed in the laboratories of our partner institutions. It also benefits from the academic and industrial network of the Ile-de-France region.

OPPORTUNITIES

This course is open to students pursuing an academic or industrial career. It also prepares them for a PhD program. Due to the diversity of the courses offered, the subject areas and technical fields are various: energy, transport, sustainable development, biomedical, cosmetics, micro/nanotechnology, etc.

CURRICULUM

S1+S2 : 60 ECTS

> S3 : 30 ECTS

> S4 : 30 ECTS

Core curriculum

Choice of specialization courses

(2nd semester)

PSL exchange week

Minimum 2-month internship

A choice of 3 tracks

- Mechanics of Design Materials for engineering and structural integrity (*Program in English and/or French*)
- Materials of the future – Design and engineering
- Microfluidics (*Program in English*)

Materials of the future – Design and engineering and Microfluidics tracks can be taken in professional training contract ("contrat de professionnalisation")

Internship

From 4 to 6 months in an academic or industrial environment, in France or abroad, in the field of research and development

TRACKS (MASTER 2)

— Mechanics of design materials for engineering and structural integrity

This track involves shared courses with Arts et Métiers ParisTech and Université Paris Saclay. It provides an education in the mechanics of materials. It focuses on the relationships between processes, materials, microstructures, and mechanical properties for advanced industrial applications and innovative processes.

— Materials of the future : design et engineering

This track provides an "integrated" perspective of various materials of the future, including synthesis processes, desired structure or architecture, eco-design and lifespan.

It can be taken in professional training contract ("contrat de professionnalisation").

— Microfluidics

Microfluidics involves shared courses with UPMC, Université Paris Diderot and Université Paris Saclay. The track provides training in the area of microfluidics (the science of flow at the micro scale) and in all areas involving fluids and micro/nanotechnologies. The curriculum therefore touches upon multiple fields, including fluid dynamics, physical chemistry, biology, and biotechnology. Students complete several practicums in micro/nanomanufacturing.

This track can be taken in professional training contract ("contrat de professionnalisation").

To apply

psl.eu/en/formation/master-s-degree-materials-science-and-engineering

Contact

Master's program managers: Cécilie Duhamel & Domitille Giaume
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TEACHING LOCATIONS AND PARTNER SCHOOLS

This Master's program is co-sponsored by MINES ParisTech, Chimie ParisTech and ESPCI Paris. Some tracks also rely on the participation of the Ecole Nationale Supérieure des Arts Décoratifs (ENSAD) or on other schools in Ile-de-France besides PSL.

The majority of classes are taught in the very center of Paris, on the campuses of our various schools involved in the program, but also in other schools besides PSL.

ADMISSIONS

Recruitment process (M1 and M2): online application

Prerequisites

— Master's Year 1

Students must have a bachelor of science degree (Chemistry, Physical chemistry, Mechanics)

— Master's Year 2

Students holding an M1 level or engineering students following a dual curriculum

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