

Welcome to  
MINES Saint-Étienne!



ATTENTION !  
AVANT CHAQUE UTILISATION  
AFIN D'ÉVITER TOUTS RISQUES  
DE FUITES ÉLECTROMAGNÉTIQUES  
VÉRIFIER QUE TOUTS LES ORGANES ET ACCESSOIRES  
INDISPENSABLES AU FOUR MICRO-ONDES  
SOIENT CORRECTEMENT INSTALLÉS

# Materials Science and Engineering

Master of Science

[www.mines-stetienne.fr](http://www.mines-stetienne.fr)



INSPIRING  
INNOVATION  
SINCE 1816

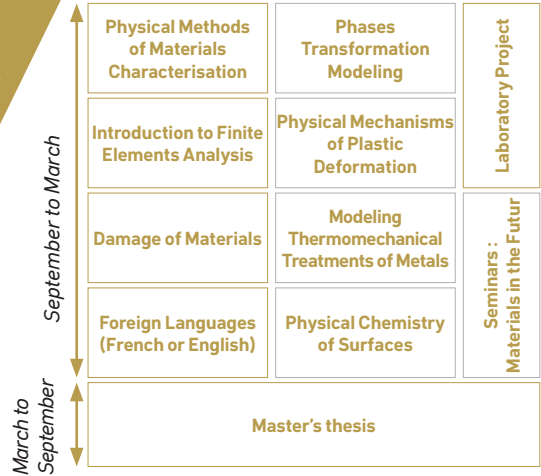
« Shape the future of materials with us ! »

A Master of Science (National Masters' Degree)  
Accredited by the French Ministry of Higher Education and Research  
at the *École Nationale Supérieure des Mines de Saint-Étienne, France*

 Taught in English

## A new opportunity for international students

- Taught in English
- A one year Programme
- A diploma of Master of Science
- A key step for PhD studies

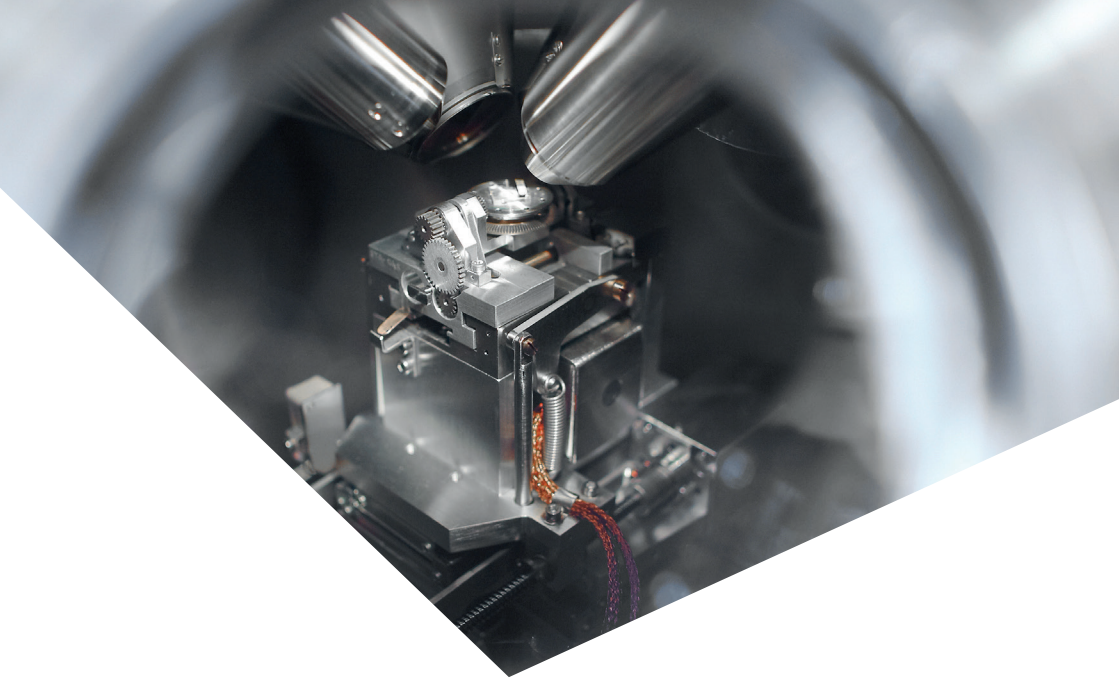


## PhD Opportunities

Each year, the SMS Centre opens around ten PhD student positions. All the positions are financially supported. The research topics are often linked to industrial partnerships while keeping a high-level scientific ambition of the project.

### **Some recent examples of on-going PhD contracts-**

- Refractory ceramic materials for incineration of industrial wastes ;
- Mechanisms of embrittlement of a martensitic stainless steel ;
- Identification of mechanical behavior of metallic surfaces hardened by contact process (inimpact, friction) ;
- Preparation and characterisation of bio-inspired composite materials containing flax fiber. Effect of interfaces on the impregnation process;
- Mechanisms of plastic deformation in high resistance HEA alloys of the CoCrFeMnNi family ;
- Effect of powder characteristics on final properties of an SLM-compacted Ti6Al4V alloy for biomedical applications.



## Internship Opportunities

The Master's Thesis internship enables students to work on different real-life materials problems, in a university laboratory, or in an R&D Centre of leading French or international companies. Each year, a large number of diversified (and financially supported) placements is available.

### ***Some recent examples of Master's theses -***

- Effect of hydrogen on mechanical properties of Ti alloys (with SAFRAN Group)
- Multiscale modelling of inelastic behaviour of INCO718 superalloy (with ONERA and SNECMA)
- Development of recrystallization textures in new Al-Li alloys for aerospace applications
- Development of new HEA (high entropy alloys)

## Job Opportunities

Professional roles in fields like materials for energy and transport, or recycling / sustainable development. Opportunities can also be found in R&D sectors, product development or innovative business companies.

## Requirements for applicants

- Prior successful completion of a first year of a Master's Degree in theoretical and / or applied science, or equivalent diploma (at the home university or Ecole des Mines) / or 240 ECTS validated
- A good command of English is mandatory



**With the collaboration of the Education and Research Centre for Materials and Mechanical Engineering (SMS) and the George Friedel Laboratory (UMR CNRS 5307)**

**Staff 92**

### **Topics**

Optimising materials and structures for Energy production, transport and storage  
Designing lighter structures for fuel-efficient transportation  
Local Multiphysics Analysis for structural materials and functional surfaces  
Human-centred design of materials and surfaces for the creative industries

### **Skills and Expertise**

Experimental and numerical simulation of direct fabrication processes for synthetic and bio-sourced composites, powder metallurgy and multimaterials  
Thermomechanical processing of alloys, microstructural evolutions, new alloys  
Durability in extreme environments  
Materials for Design and the Creative Industries

### **Industrial partners:**

Cooperation with leading French or international companies such as Arcelor Mittal, EDF, AREVA, Constellium, Aubert&Duval, SAFRAN Group, and many others.

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**La Région**  
Auvergne-Rhône-Alpes



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