



# Tribology and Surface Engineering

Master of Science

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



INSPIRING  
INNOVATION  
SINCE 1816

**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, and 3 institutions of the **COMUE of Lyon University** (Lyon 1, ECL, ENISE)*

 **Taught in English**

## **A new opportunity for international students**

- Taught in English (the French-taught cursus is also available for foreign student)
- A one-year programme
- Master of science diploma
- A key step for PhD studies

**Preparing students for the latest challenges in Surface Engineering applied to industrial and academic R&D.**

**The Master of Science is based on a set of courses in the field of Tribology and Surface Engineering taught by members of the research labs and industries involved in Manutech in the Lyon - St-Etienne Area. It aims to provide students with fundamental and advanced knowledge of this research field.**

**Core subjects cover topics which are explored in depth in elective classes and through laboratory work.**



## Course structure

### **Mandatory courses (12 ECTS)**

- Computational mechanics (Mandatory 6 ECTS)
- Mechanics of materials (Mandatory 6 ECTS)

### **Specific courses (12 ECTS)**

- Corrosion and surface reactivity (6 ECTS)
- Tribology and Surface characterisation (3 ECTS)
- Surface functionalisation (3 ECTS)
- Coatings in surface engineering (3 ECTS)
- Mechanical surface texturing (3 ECTS)

### **Additional courses (6 ECTS)**

- Damage and Fracture Mechanics (6 ECTS)
- Additive Manufacturing (6 ECTS)
- Solid and structure dynamics (3 ECTS)
- Mechanics of composite materials (3 ECTS)

### **Human sciences and lab project (9 ECTS)**

- English and/or French (3 ECTS)
- Bibliographic study (3 ECTS)
- Lab project (3 ECTS)

### **6-month Research training period (21 ECTS)**

## PhD Opportunities

### **PhD in the field of Materials, Mechanical and Surface Science and Engineering**

Each year several positions are available in research institutions involved in Manutech

## Internship Opportunities

**Internships in research institutions involved in Manutech and/or with their industrial partners.**

## Job Opportunities

**Research & Development in mechanics and surface engineering for mechanical industries and research institutions.**

## 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  
research Laboratory  
Georges Friedel which gathers:**

**Centre for Materials and  
Mechanical Engineering (SMS)**

**Centre for Science of Industrial  
and Natural Processes (SPIN)**

**50 researchers**

**65 PhD Students**

**Industrial partnerships**

(Areva, Safran, EADS, CEA, H&F, ...)

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**La Région**  
Auvergne-Rhône-Alpes



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