



MASTER'S DEGREE
PROGRAMME // M1 + M2



MECHANICAL ENGINEERING

*Sustainable Manufacturing
& Advanced Technologies*



enise.fr/en



How to apply?
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MASTER IN MECHANICAL ENGINEERING

Sustainable Manufacturing & Advanced Technologies

An international 2 year Master programme with 4 semesters fully taught in English at Ecole Centrale de Lyon and Mines Saint-Etienne, 5 month internship and projects in a multidisciplinary environment.

Description

This training innovatively combines theoretical and applied courses (via projects and labs) with internships in a multidisciplinary environment. It covers a large spectrum starting from fundamentals of advanced manufacturing processes, materials science and characterization in M1 up to the cutting edge research on key topics in M2 such as component durability.

Objectives

SMAT intends to train a new generation of graduates and future industrial managers that are capable to **embrace future technological and environmental challenges towards a sustainable environment by:**

- providing them with **strong basis** in materials and advanced manufacturing processes ;
- Developing a **practical know-how** on a wide range of manufacturing and characterization techniques;
- Training them in **collaborative work and project management**;
- Proposing a key **specialization** in sustainable manufacturing.



FUNDAMENTALS OF MANUFACTURING PROCESSES*

30 ECTS

- Basics of production engineering
- Metalworking processes
- Additive manufacturing
- High temperature processes
- Physical Measurement
- Transverse project on manufacturing
- Research Methods
- French for beginners



FUNDAMENTALS OF MATERIALS*

30 ECTS

- Microstructure and mechanical properties
- Plastic deformation
- Phase diagrams
- Materials selection
- Solid state transfo.
- Materials mechanics
- Materials characterization
- Surface characterization



SPECIALIZATION IN SUSTAINABLE MANUFACTURING*

30 ECTS

- Surface Engineering
- Modelling of surface integrity
- Functional & in-use properties
- Component repair
- Life Cycle Assessment
- Strategic Management
- Advanced French



INTERNSHIP*

30 ECTS

- Minimum 20 weeks
- Written report
- Oral presentation

* All the courses are taught **exclusively in English**