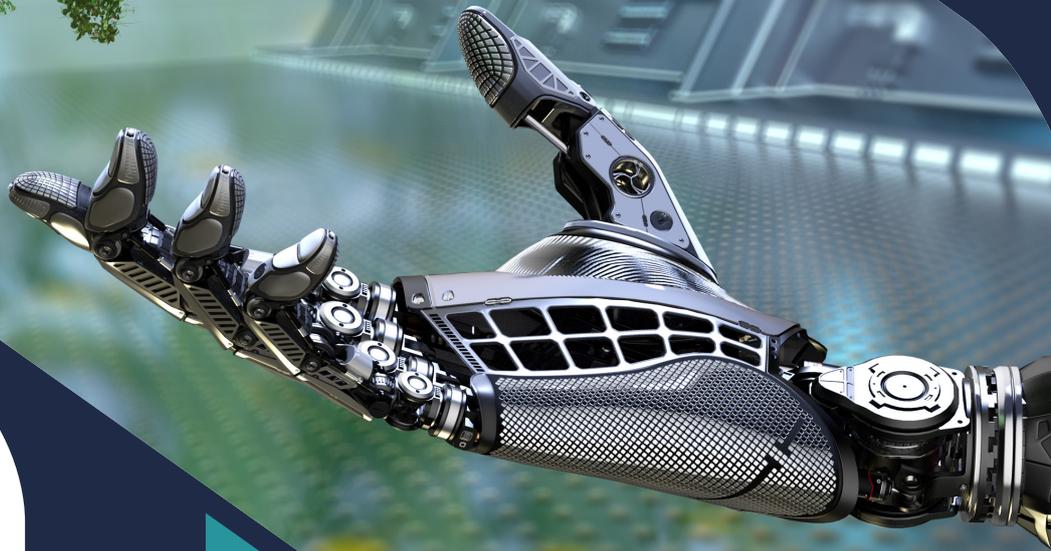




MECHANICS & MATERIALS FOR SUSTAINABLE ENGINEERING

Graduate Track For Intelligent & Innovative Mobility



CLERMONT
AUVERGNE
INP
Clermont

Sigma
Clermont



Institute of Technology

3 graduate schools of Engineering in Clermont-Ferrand

Clermont Auvergne University

Computer science • Biological Engineering • Mechanical Engineering • Civil Engineering • Electrical Engineering • Mathematical Engineering & Data Science • Engineering Physics • Production Systems Engineering • Chemistry & Chemical Engineering

3 engineering graduate schools
Clermont Auvergne INP - ISIMA
Clermont Auvergne INP - SIGMA Clermont
Clermont Auvergne INP - Polytech Clermont

4 engineering preparatory classes
(at undergraduate level)
La Prépa des INP (Groupe INP)
CPI (Fédération Gay-Lussac)
Prép' Isima
PeiP (réseau Polytech)

2 500 students

189 international cooperation agreements

350 academic & administrative staff

3 Main research centers affiliated to the French National Research Centre (CNRS)

INP Member of the INP Group
+35 public engineering school in France

1 professional training department



EDUCATION



RESEARCH



PROMOTION OF RESEARCH



SIGMA Clermont is a public engineering school proposing high-level graduate courses in the fields of Advanced Mechanics, Industrial Engineering, Robotics, Chemistry, Process Engineering, Materials, Structures and Systems. Independent and reactive, the school puts its connections with industry and research and development at the heart of its training programs. SIGMA Clermont was created by the merger of ENSCCF and IFMA, and has been part of Clermont Auvergne INP since 2020. The school is affiliated with *Institut Mines Telecom*.

SIGMA Clermont has the 2-star "Bienvenue en France" label. The Master's degree is accredited by the French Ministry of Higher Education and Research and by the *Commission des Titres d'Ingénieur*, one of the foremost higher education quality assurance organisations in Europe.



MASTER'S DEGREE IN MECHANICS AND MATERIALS FOR SUSTAINABLE ENGINEERING

The mobility of people and objects consumes a large quantity of natural resources, in terms of both materials and energy. The design, manufacture, mechanical performance, maintenance and recycling of products must now integrate environmental concerns.



In short:

> **Master's degree in mechanical engineering** (diplôme d'ingénieur Grande Ecole)

> **Duration: 2 years**

> **Starting in: September**

> **Training period:**
3 semesters at SIGMA Clermont
+ 1 semester of internship

> **Language: English**
+ additional French language courses

> **ECTS: 30/semester**

This master offers students **multidisciplinary training in the field of mechanical engineering**, including in particular:

- **mechanical design**, integrating the **choice of materials** according to their **impact on the environment**
- general knowledge on **bio-based materials**
- development and elaboration of **new biopolymers and biocomposites** intended for 3D printing
- **management of the life cycle of a part**, a product or a structure, including the planning and optimization of maintenance.

Take advantage of specialized training, design and print your own biocomposites in the FabLab, and test the parts in the materials testing lab! And if you need any help, for your study program or in your everyday life, just ask your SIGMA buddy!

Hosting graduate school:



Contact: Xavier BALANDRAUD - xavier.balandraud@sigma-clermont.fr

PROGRAM

1ST SEMESTER

- 1/ Introduction to French language (10h)
- 2/ French (48h)
- 3/ How to design your personal and professional development plan (20h)
- 4/ Mechanical engineering project (30h)
- 5/ Project in mechanics and materials for sustainable engineering (220h)
- 6/ Elective courses in mechanics and materials

2ND SEMESTER

- 1/ Structural optimization (28h)
- 2/ Fracture mechanics (28h)
- 3/ Maintenance optimization (36h)
- 4/ Bio-based materials (36h)
- 5/ Composite materials (28h)
- 6/ Project (50h)
- 7/ French for business (26h)
- 8/ French (26h)
- 9/ Marketing and management (36h)
- 10/ Economy (22h)
- 11/ 16-week internship (between the 2nd and 3rd semesters)

3RD SEMESTER

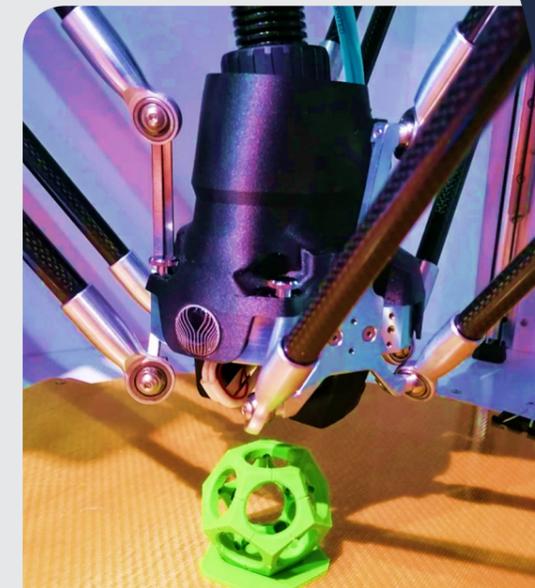
- 1/ Sustainable manufacturing and innovation (30h)
- 2/ Innovative materials (28h)
- 3/ Experimental characterization of materials (28h)
- 4/ Impact of materials on environment (28h)
- 5/ Uncertainty quantification (28h)
- 6/ Project (150h)
- 7/ English (24h)
- 8/ Job marketing (14h)
- 9/ French (26h)

4TH SEMESTER

- 1/ Management (16h)
- 2/ Engineer responsibilities (16h)
- 3/ TOEIC preparation
- 4/ Preparation for certification in French language
- 5/ Final 22-week internship

ADMISSION CRITERIA

- Applicants should hold a valid Bachelor's degree in Mechanical Engineering.
- The selection process will be based on the examination of the application file (cv, transcript of the BEng, English language certification). The candidate may be invited to an interview.



> 4 scientific semester projects and 2 internships:

- 16-week internship between the 2nd and 3rd semesters
- Final 22-week internship

> In collaboration with industrial partners and research laboratories

> Scholarship opportunities are available for excellent candidates.

> PhD scholarships will also be offered after the Master's degree for top performers.



SIGMA Clermont

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TSA 62006
63178 Aubière Cedex

www.sigma-clermont.fr

