

# Master in Materials science and engineering

## The programme offers the following course(s) :

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- › Electrochemistry and processes 1st and 2nd year
- › Engineering of functional materials 2nd year
- › Materials for nuclear energy 2nd year
- › Bio refinery and bio materials 1st and 2nd year
- › Functionalized advanced materials 1st and 2nd year
- › Innovation in nuclear energy 1st and 2nd year

## Presentation

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### **Course co-accredited by the National Polytechnic Institute of Grenoble (Grenoble INP) and Université Grenoble Alpes**

The SGM research master offers a very diverse course, focusing on both structural (for transport, conversion of energy) and functional materials (for microelectronics in particular). The scientific training covers the essential concepts on development, phenomena governing the genesis of microstructures, and behaviour (mechanical, electronic, surfaces, etc.). Modelling and simulation in materials science, an important theme in the laboratories associated with the training, is also discussed.

The considerable time given to optional courses means that the programme can be adapted to each student's career plan.

The training curriculum contains a series of courses and an internship of at least 5 months providing an introduction to research.

There are employment opportunities in public and private research and in industrial R&D in sectors such as metallurgy, microelectronics, transport, energy conversion and chemistry.

During the 1st year year, students follow a foundation programme worth 24 ECTS, which mainly covers the basic tools needed for materials science.

Two standard programmes in French are offered for this specialisation. In accordance with site policy, these courses are offered under the dual course in 2nd year to students at Grenoble INP-PHELMA on the "Materials Science and Engineering", and "Electrochemistry and Processes" courses.

As such, many elements of the master are shared with these courses from Grenoble INP-PHELMA. Two international programmes are also offered, with classes in English and individual support for students, in two fields: materials for nuclear energy, and functional materials; in both cases these curricula draw on European networks (KICs, Erasmus Mundus).

## Objectives

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The SGM specialisation provides courses on the boundary between physics and chemistry in the areas of materials, electrochemistry and the associated processes. The areas covered are essential to industry, which is continually required to respond to new, mainly environmental, challenges (reducing the weight of structural materials, developing new materials for energy production, conversion and storage, packaging and recycling, etc.). This specialisation therefore teaches the methodological and scientific tools graduates will need to take part in research and innovation in these application areas. During the 1st year year, students follow a foundation programme worth 24 ECTS, which mainly covers the basic tools needed for materials science. Two standard programmes in French are offered for this specialisation. In accordance with site policy, these courses are

offered under the dual course in M2 to students of Grenoble INP-PHELMA in the SIM (Materials Science and Engineering) and EPEE (Electrochemistry and Processes) courses. As such, many elements of the Master are shared with these courses from Grenoble INP-PHELMA. Two international programmes are also offered, with classes in English and individual support for students, in two fields: materials for nuclear energy, and functional materials; in both cases these curricula draw on European networks (KICs, Erasmus Mundus).

Career opportunities for each standard programme: Doctorate in Engineering Sciences, Researcher in a public organisation or in industry - Study and project engineer.

## Registration and scholarships

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To be accepted for a master 1, you must hold a bachelor degree (licence 3rd year) or equivalent. To be accepted for a master 2, you must hold a master 1 degree or equivalent. Your previous studies must be compatible with the master you wish to study. The recruitment and registration conditions are stated for each speciality.

See Grenoble INP website : <http://www.grenoble-inp.fr/fr/formation/les-admissions>

## Further studies

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PhD - Science and Engineering of materials and associated processes, applications for energy (nuclear, fuel cells, batteries, photovoltaic ...), transport, metallurgy, microelectronics. Doctoral School I-MEP2

## Practicals informations :

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- > **School** : Grenoble INP
- > **level** : Baccalaureate +5
- > **Duration** : 2 years
- > **Credits** : 120
- > **Course type** : Initial and Continuing Education
- > **Location(s)** : Grenoble - University campus
- > **Contacts** :

### Programme director

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### Programme administration

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