

Master in Materials science and engineering

Innovation in nuclear energy 1st and 2nd year

Présentation

This European master is at the heart of InnoEnergy - a strongly integrated alliance of European key players from education, research and industry in the field of sustainable energy. InnoEnergy aims at developing an innovation and entrepreneurship-driven culture to boost sustainable energy innovation in Europe. Thus, InnoEnergy will strive for the development of leaders, by building more agile and dynamic interfaces between industry and academia and promoting entrepreneurial mindset among students, researchers and business people.

The ongoing advances in nuclear science and technology play the central role in the development of future nuclear power systems, and are also crucial for how successfully we can handle the nuclear waste problem in a responsible manner. From this perspective, it is of vital importance to offer high quality education to the next generation of nuclear scientists and engineers.

This master combines outstanding technical training in nuclear energy along with best practices in innovation. It includes a mobility within the academic partners (KTH, UPC, Grenoble INP and Paris) as well as a close collaboration with the main actors of the nuclear industry in Europe. This leads to lectures by professionals, in-house trainings and internships for the students.

Objectifs

The objectives are to become a :

- Project manager in the nuclear industry
- Nuclear engineer with a knowledge ranging from design and construction, to operation and maintenance, to power station decommissioning and waste management of the fuel cycle
- Researcher, continue with a PhD

Admission

See the site : [Admission criteria](#)

- Apply now : [How to Apply for our programs](#)
- Fees : www.grenoble-inp.fr/admissions
- Financial aid : 24 scholarships for EMINE
- INNOENERGY wants to attract the best students, innovation-oriented and with an entrepreneurial mindset
- There are 20 scholarships divided in 2 types - following the application quality -, available for the best students applying to EMINE (European Master on Innovation in nuclear energy).

The scholarships include :

1. Monthly allowance
2. Tuition fees covered
3. Travel and installation cost

Infos pratiques :

- > **Composante** : Grenoble INP
- > **Durée** : 2 ans
- > **Type de formation** : Formation initiale / continue
- > **Lieu** : Grenoble - Domaine universitaire

Programme

- **YEAR 1 (60 ECTS credits*)**
- **First year courses at KTH (august - may)**
 - Radiation, protection, dosimetry and detectors
 - Sustainable power generation
 - Nuclear reactor physics, major course
 - Nuclear reactor technology
 - Nuclear power safety
 - Electives : renewable energy technology / thermal-hydraulics in nuclear energy engineering / nuclear physics / radiation damage in materials / generation IV reactors / nuclear reactor dynamics and stability
- **First year courses at UPC (october - june)**
 - Fundamentals of nuclear engineering and radiological protection
 - Nuclear power plants
 - Fuel cycle and environmental impact
 - Regulations and safety
 - Management of nuclear power plants
 - **Elective Block** : Every year a series of elective courses will be offered and students should select 3 of them. Among others, the following courses will be offered : nuclear fusion / new designs in fission reactors / instrumentation / non-destructive rehearsal techniques / Monte-Carlo methods used for calculating radiation transport
- **YEAR 2 - Semester 1 (30 ECTS* credits)**
- **Second year courses at Grenoble INP (september - january)**
 - Fundamentals in nuclear energy
 - Materials for nuclear reactors
 - Physics of irradiated materials
 - Material ageing in a nuclear environment
 - **Elective** : components: courses at EDF R&D (90 h) / fuels: courses at CEA Cadarache (90 h)
- **Second year courses at ParisTech**
 - Five majors are possible at Paris : Nuclear reactor physics and engineering (website) / nuclear plant design / operations / fuel cycle (engineering or radiochemistry) / decommissioning and waste management
- **YEAR 2 - Semester 2 (30 ECTS* credits) : february - june**
- Internship minimum of 5 months