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GRENOBLE INP UGA Phelma

Graduate School of Engineering in Physics, Electronics, Materials Sciences

International **Master MaNuEn**
Materials science for **Nuclear Energy**

PRESENTATION

The international Master MaNuEn - Materials science for Nuclear Energy is a master program taught in English. It covers specificities of materials used in a nuclear environment (nuclear fuels, components) with focus on their durability under irradiation. During the first year you will be integrated in the international course of Phelma. The program content of the second year was developed with EDF, Framatome and CEA engineers and is co-accreditated by INSTN. The second year takes place over two semesters: the first semester (September-January) is devoted to courses : a common core and two specialized modules ("Fuels" and "Components") taking place at the CEA Cadarache and at the Material Ageing Institute of EDF R&D.The last semester of the programme is dedicated to a master thesis of 5 months minimum.

INDUSTRIAL SECTORS

The strong partnership with engineers and researchers of EDF R&D, CEA-ISNTN and Framatome working on materials for nuclear industry will allow you to refine your professional project. The international Master MaNuEn will allow you to become a nuclear engineer or a researcher in R&D department. As an engineer you will have knowledge ranging from innovation in design and construction, operation and maintenance to fuel cycle and materials ageing. As a researcher you will be able, often after a PhD, to enter in the large R&D center involved in nuclear engineering (EDF, AREVA, CEA, Framatome…) but also in academic laboratories all around the world.

RESEARCH

In Grenoble there are several laboratories involved in the nuclear research. The group nuclear physics at LPSC laboratory (www.lpsc.in2p3.fr) is for example working on the physics of reactors (molten salt reactors, nuclear data, thorium, and accelerator driven systems). The SIMAP laboratory (www.simap.grenoble-inp.fr) is involved in multiscale modelling of irradiation defects in materials and also in materials behavior for fission reactors and ITER. The LEPMI laboratory (www.lepmi.grenoble-inp.fr) is also involved in nuclear engineering (fluid dynamics, corrosion…).

cea EDF instn framatome

ASSETS

The master has been initiated by Yves Bréchet who is member of the French Academic of Sciences and has been Scientific Advisor at the CEA, one of the most important position of the CEA center.

THE STRONG POINTS OF THE MASTER ARE:

- A strong partnership with EDF, CEA-INSTN and Framatome: this master is supported by these three key players of the nuclear industry
- 50 % of the course are given by engineers and researchers from EDF, CEA-INSTN and Framatome
- Two course modules taking place at industrial facilities: 3 weeks are planed at the CEA Cadarache and one week at the R&D center of EDF in Renardières near Paris and 1 day at the deisgn school of Framatome in Lyon
- All courses are taught in English in an international environment
- Learning expedition and visit of nuclear facilities

PRESS RANKINGS

Shanghai
Since 2020, Grenoble INP - UGA has contributed to the international ranking of the University of Grenoble Alpes
Shanghai Global 2022
Grenoble Alpes University ranked among the 150 best universities in the world and in the top 5 of French universities.

QS 2023 ranking by theme: Grenoble INP - UGA makes good progress in the field of engineering and technology
Grenoble INP - UGA has made good progress in the overall field of "engineering and technology", moving up 74 places to 93rd position worldwide and 5th position in France, making it the leading institution outside the Paris region. The institute has made eight appearances in this ranking.

REUTERS

Grenoble INP - UGA leader in 2 lists from Reuters Ranking 2019

Most innovative universities in Europe
- 2nd of the French Engineerings Schools
- 13th in France

Grenoble INP - Phelma, UGA is the school for scientific diversity. It offers its students courses in various fields with a promising future:

- **Microelectronics and nano-technologies** (electronics, nanosciences, materials, health),
- **Decarbonated energy** (nuclear energy, photovoltaic, electrochemical storage),
- **Information technology** (digital communication, image and signal processing, telecommunications, computing and networks, Internet of Things, artificial intelligence),
- **Innovative materials** (for aeronautics, automobiles, sport & leisures, health, microelectronics, energy),
- **Biotechnology and biomedical engineering** (medical imagery and therapy, implantable devices),
- **Sustainable development** (decarbonated energies, eco-processes, recycling, material durability, energy management, natural signal analysis).

Based in Grenoble in the heart of the French Rhône Alpes region, Phelma boasts a rich academic and industrial infrastructure. As the only teaching institute on the Minatec innovation campus, Phelma benefits from an exceptional Training / Research / Industry synergy.

GRENOBLE INP Phelma UGA

1,400 students
+ 380 Engineering graduates a year
More than 25% of engineering graduates go on to complete a thesis

110 permanent teacher-researchers from **11** laboratories associated with the school
Approximately 370 stakeholders from industry and research

CONTACT

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