

# MASTER'S DEGREE IN NUCLEAR ENERGY

U N I V E R S I T É P S L

*The Master Nuclear Energy (Nuclear Engineering) is an international Master's degree that aims to provide high-level foreign and French students with the main skills needed in the nuclear industry producing low-carbon electricity.*

*Through the quality and scope of the content covered, it makes it possible to meet a wide range of needs of companies in this field by recruiting students with high initial employability.*

*Part of PSL's graduate program in Engineering (ISAI), this Master's degree also aims to prepare students for research in the nuclear field. The entire Master's programme therefore integrates the various professions in civil nuclear energy. The courses are taught entirely in English*

## MAIN ASSETS

- **Acquired expertise in the electro-nuclear field**
- **5 specialisations to choose**
- **Training in innovation through research:** over the 2 years of the course, students will be required to complete 30 weeks of internships in different industrial groups or academic partners.
- **Industrial partnerships:** the Nuclear Energy Master's Degree is the subject of a multi-year agreement with EDF, and various industrial players are involved, particularly in the running of courses or site visits.
- **International outlook:** the two years of the Master's programme are taught in English, with support courses in French for foreign students. The Master's degree has obtained the labels of International Institute of Nuclear Energy (I2EN) and European Master's in Nuclear Energy (EMINE).
- **Teaching excellence:** a training programme led by major players in the Paris region (PSL, IP Paris, Université Paris-Saclay, Ecole des Ponts)..

## LEARNING OUTCOMES

The objective of the course is to provide students with expertise in the nuclear energy sector and specialisation in a particular field, from fuel chemistry to decommissioning, including plant design and management.

- **Master's Year 1:** ensure a solid base of training in the basic disciplines prior to the specialisation proposed in M2, and to manage the diversity of previous courses.
- **Master's Year 2:** enable the student to acquire a skill in one of the 5 proposed majors.

## CAREER OPPORTUNITIES

This training is aimed at students eager to pursue a career in the industry in the nuclear energy sector or energy transition, as well as those wishing to pursue a thesis for a career in research.

English track

## CURRICULUM

### Master's Year 1 (60 ECTS)

#### 2 tracks

- Physics & Engineering
- Chemistry & Chemical Engineering

#### Core curriculum

- Nuclear Physics
- Thermodynamics
- Interactions of Radiation with Matter
- Basic Neutronics
- Energy Production Technologies
- Mathematics
- Language & Culture
- Economics of Energy
- Project Management
- Chemical Engineering
- Data processing

#### Track-specific modules

#### a 10-week internship

In the research laboratories of the partner schools.

### Master's Year 2 (60 ECTS)

#### 5 tracks

- Fuel Cycle
- Decommissioning and Waste Management
- Operations
- Nuclear Plant and Design
- Nuclear Reactor Physics and Engineering

#### Core curriculum

Track-specific modules, partially mutualized

#### a 20-week internship

in an industrial environment or in a academic or industrial research group

## INSTRUCTIONAL CONTENT

### MASTER 1

The two M1 majors (Physics & Engineering and Chemistry & Chemical Engineering) aim to provide a broad education ranging from the indispensable scientific and technological aspects to the physical and chemical aspects of the nuclear energy field. They share a common core and include both fundamental courses underpinning the nuclear energy professions and courses oriented towards chemistry or physics.

Chimie ParisTech – PSL is involved in the Chemistry and Chemical Engineering track offering 6 modules : Speciation and Process, Chemistry of Materials, Radiolysis, Atomic & Molecular Spectroscopy, Analysis Methods Nuclear Field, Separation chemistry.

### MASTER 2

All students will follow a common core curriculum whose objective is to build common skills necessary for a good analysis of concepts that will be presented in each sub-tracks.

The student will choose one specialization among five. Chimie ParisTech – PSL is involved in Fuel Cycle. This speciality is a reference training in the field of nuclear energy with the aim of giving future managers a global vision of chemistry and physico-chemistry applied to the nuclear field, through high-level theoretical and

practical teaching.

The specificity of this speciality is to provide all the scientific tools to study the behaviour of radionuclides in condensed phase. It also enables students to complete a thesis and to pursue careers in research.

All courses are taught in English..

## ADMISSIONS

### Prerequisites

— **Master's Year 1:** Students holding a bachelor's degree or scientific bachelor's degree (Physics, Chemistry, Science and Technology, Mechanics, Engineering Sciences, etc.).

— **Master's Year 2:** Students holding a scientific M1 level, engineering students in dual curriculum, students of the Fédération Gay-Lussac in mobility.

### Selection process

Base on application.

## DIPLOMA DELIVERED

National Master's degree conferred by Université PSL and prepared at Chimie ParisTech – PSL.

### More information

[psl.eu/en/education/master-s-degree-nuclear-energy](https://psl.eu/en/education/master-s-degree-nuclear-energy)

### Contact

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Partner

