



IMT Atlantique  
Bretagne-Pays de la Loire  
Ecole Mines-Télécom

# NUCLEAR MEDICAL APPLICATIONS MASTER OF SCIENCE

## ACCREDITATION

The MSc in Nuclear Engineering (NE), track in Nuclear Medical Applications is accredited by the Ministry of Higher Education, Research and Innovation.

National Accreditation Reference: 20170877-1701324R.

## Mention

Nuclear Engineering

## KEY WORDS

Nuclear Medicine, Radioprotection, Medical physics, Dosimetry, Project Management.

## SCHOOL OFFERING THE MASTER

IMT Atlantique is a "Grande Ecole" ranked among the best French Graduate Engineering Schools, and recognized internationally as a leading Technological University in the world most prestigious rankings. It is a member of Institut Mines-Télécom (IMT), the largest group of public Engineering and Management Graduate Schools in France.

## LOCATION

This MSc program is offered on Nantes campus. Nantes is France's sixth-largest city and capital of the third largest industrial region. Nantes lies just 50 km from the Atlantic coast; Paris is 2 hours away by high-speed train. Nantes is a dynamic city, which has been frequently recognized for its quality of life. The campus provides all the students facilities: student's residence, sports facilities, wireless network, library, associations, etc.

## INDUSTRIAL PARTNERS

CEA, ARRONAX, GE Healthcare...

## LANGUAGE OF TEACHING

**Year 1:** in English

**Year 2:** in French

## ENVIRONMENT

Nantes is the main center of Western France in the field of medical physics and nuclear medicine, thanks to the presence of important research centers such as the Research laboratory SUBATECH, the cyclotron ARRONAX, the university Hospital of Nantes, etc. Students can benefit from more than ten years of teaching team experience and from the adapted Research environment.

## COURSE AIMS

This Master develops fundamental scientific, technical and industrial knowledge of the different nuclear technologies used in the medical field. It has a particular focus on the safety and radioprotection, to be considered in the management of a large project in this field.

## PROGRAM

### Scientific and technical modules:

- > Physics of Ionizing Radiation
- > Introduction to Nuclear modeling
- > Introduction to Neutron physics
- > Radioprotection
- > Physico-Chemistry of Environment

- > Introduction to Nuclear Technology
- > Nuclear Reactions and Radiations
- > Mathematical Tools and Computer Simulation
- > Dosimetry
- > Medical Imaging Techniques

### Management modules:

- > Nuclear: Management, Safety and Society
- > Energy mix and energetic transition
- > Environmental Management and Strategy of sustainability

Company visits, Scientific seminars, Technical projects, Generic methods for Engineers, French language & culture.

### Professional coaching (Student centred process of reflection on competencies and professional objectives)

- > 6-month MSc thesis in Industry or research lab

## ADMISSION REQUIREMENTS

This Master is open to applicants with at least a scientific Bachelor of Science degree in a scientific discipline such as Nuclear, Chemistry, Physics, Electrical, Mechanical, Chemical, Energy, Environmental or Civil Engineering.

Possible admission directly in the 2<sup>nd</sup> year for students who have a 4-year Bachelor degree or first year of Master in Nuclear Engineering or Nuclear Physics.

## LANGUAGE REQUIREMENTS

### English

- > Mother tongue or
- > Bachelor degree taught in English or
- > English test such as:
  - > TOEFL IBT 80
  - > IELTS 6.0
  - > TOEIC 750
  - > Cambridge

No prerequisite in French.

## APPLYING

Apply at:

<https://ne.imt-atlantique.fr>

## STRONG POINTS OF THE SCHOOL

- > MSc accredited by the Ministry of Higher Education, Research and Innovation
- > International Faculty
- > Masters taught in small groups
- > Strong links with the industries
- > 6-month master thesis in industry or in a research lab
- > Intercultural seminars
- > Free French language courses
- > Master boosted by a research department
- > An international team for international students
- > A quality chart to welcome international students
- > Accommodation available on campus
- > Scholarship based on excellence
- > French Summer School program in July and August for students who wish to improve French language and culture skills

# NUCLEAR MEDICAL APPLICATIONS

## MASTER OF SCIENCE

### COMPETENCES ACQUIRED

- > Acquire the basic scientific knowledge relative to nuclear technologies, necessary for understanding their utility and danger in medical applications
- > Develop competences in beams production and qualification
- > Master the operational techniques and strategies for the management of a project in nuclear medicine. Implement appropriate solutions through projects in/with industry
- > Develop competences in radioprotection and nuclear waste management in the medical environment
- > Build contacts with a large number of international key players in the field
- > Develop an awareness of societal considerations related to nuclear medicine

### TYPICAL JOBS

- > Project engineer related to medical installations
- > Safety engineer in medical installations
- > Operation engineer of medical installations (radiology equipments, accelerators...)
- > Research scientist and development engineer for medical installations

### COST

Participation cost for free movers:

- > €12,000/year

### SCHOLARSHIPS

Scholarships are available depending on the applicant's situation:

- > Excellence of profile
- > Country of origin
- > University of origin
- > Participation to student's fair
- > Recommendation from French Embassy, etc

### CALENDAR

One intake per year in September.

**Year 1:** Two academic semesters on Nantes campus

**Year 2:** One academic semester on Nantes campus + 6-month Master thesis in industry or in a research lab.

### LODGING

The student's residence (called "MDE") located on campus offers furnished individual rooms. They are 18m<sup>2</sup> and equipped with a private bathroom and a small kitchen.

Some rooms for couples are also available. The standard size is 30m<sup>2</sup>, including a living room and a separate bedroom.

[housing-nantes@imt-atlantique.fr](mailto:housing-nantes@imt-atlantique.fr)

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### CONTACT

IMT Atlantique  
Nantes Campus  
La Chanterie  
4 rue Alfred Kastler  
CS 20722  
44307 Nantes cedex 3  
FRANCE  
[www.imt-atlantique.fr/ne](http://www.imt-atlantique.fr/ne)  
[ne-apply@imt-atlantique.fr](mailto:ne-apply@imt-atlantique.fr)