



INTERNATIONAL MASTER'S DEGREE

/ ELECTRICAL ENERGY

Through this Master's degree, students will acquire excellent skills in the management of electrical energy. Based on Electrical Engineering courses, students will be able to design, develop and improve complex electrical systems (innovative machine, advanced power electronics, smart grid and multi-source systems), and to prepare a PhD.

INTERNATIONAL MASTER'S DEGREE / ELECTRICAL ENERGY

ADVANCED NUMERICAL MODELING
ELECTRICAL MACHINES
ELECTRICAL MULTI-SOURCE SYSTEMS
POWER ELECTRONICS & POWER QUALITY

/ SYLLABUS

By focusing on the management of Electrical Energy the Master's program covers various topics related to electrical Engineering : Advanced Modeling of Electromagnetic Devices, Control Management of Electrical Energy. The field of applications concerns more particularly energy conversion, transportation (boats, aircrafts, automotive...), sustainable development (wind and marine energy and their integration in the network) and multi-source systems.

Studies in the Master's syllabus are organized in two semesters.

→ 245h (209h instructor-led and 36h e-Learning)
→ 300h personal work – 60 European Credits (ECTS)

Semester 1 : 6 Teaching Units - 30 ECTS

Core course (4 Teaching Units – 20 ECTS)

- TU1 : Electrical energy conversion : 36h – 5 ECTS
- TU2 : Advanced electromagnetics : 36h – 5 ECTS
- TU3 : Numerical methods : 36h – 5 ECTS
- TU4 : Signal processing and control : 36h – 5 ECTS

Optional course (2 Teaching Units out of 3 – 10 ECTS)

- TU5 : Electrical energy System : 38h – 5 ECTS
- TU6 : Advanced numerical modeling : 38h – 5 ECTS
- TU7 : Electrical systems control : 38h – 5 ECTS

Semester 2

1 Teaching UnitS + internship - 30 ECTS

Internship : 5 months - 25 ECTS

- TU8 : Scientific Innovation: 25 h – 5 ECTS

/ CAREER OPPORTUNITIES

→ Undertaking a Ph.D. at an industrial or academic laboratory,
→ Becoming an expert in designing and manufacturing electrical equipment,
→ Contributing to the development of renewable energies and their integration in the network,
→ Joining R&D services from SMEs to multinational groups in the field of electrical energy management and the design of innovative machines.



/ SKILLS

- To be able to design innovative solutions for the electrical integration of renewable energies
- To integrate electrical efficiency and eco-conception rules during the design of electrical systems
- To model a multiphysics system including sensors, electrical systems and control process
- To be able to design optimal electrical energy management systems

/ HOSTING RESEARCH LABS



IREENA
(Nantes Atlantique Electrical Engineering Research Institute)



SATIE
(Laboratory of Systems and Applications of Technologies)



IETR
(Electronics and Telecommunications Institute of Rennes)

/ ADMISSION

It is a two-year-Master's degree. In Polytech Nantes, only the second year is accessible, so applicants should hold a degree which validates at least 4-years in higher education (i.e. a 3-year Bachelor is not acceptable) and should be in one of the following fields: *Electrical engineering, Applied mathematics and physics,*

/ CONTACT

→ Send the requested documents to :

master-ee@univ-nantes.fr

/ THE ENROLMENT

→ For students coming from **a partner university** with Polytech, please contact the international office coordinator of your home university concerning the enrolment.

→ For students coming from a country that is part of the **Campus France** procedure, please enrol with Campus France first, and then send us the requested documents below.

→ For students coming from a country that is not part of the Campus France procedure, please send us directly the requested documents below.

→ a detailed CV in English (including the precise content of your studies, which topics were studied each year, grades/marks obtained, score obtained for an international test of English, reports you may have written during your studies)

→ a cover letter

→ a complete transcript in English of years of study at the University

→ a copy of your passport

→ an identity photo

→ a recommendation letter

➤ Fill in the application form on our website www.univ-nantes.fr/polytech/internationalmasters

/ LANGUAGE

The program mainly aims at international students and is taught in English. **A good command of the English language is required** (B2 score as defined by the Council of Europe). Introductions to French language and European culture are provided locally at Polytech Nantes (Gavy Campus - Saint-Nazaire), (included in the fees and coordinated with the Master's program), but there are no prerequisites in the French language.

/ COSTS

This cost corresponds to education and training costs, and furthermore, it includes an internship in a lab, French courses, cultural outings and student social security*

*It is included if you are less than 28 years old. If not, you will have to pay your own social security



More information :

www.univ-nantes.fr/polytech/internationalmasters

/ INTERNSHIP

During the 2nd semester, students complete a 5 month research thesis/internship in a laboratory or company which allows them to be paid around €2500 (€500 per month).

/ ACADEMIC CALENDAR

The courses start in early September.

/ LOCATION

For the Master's degree in **Data Science, Thermal Science and Energy, Visual Computing and Wireless Embedded Technologies, courses** are located in Nantes, on the Chantrerie Campus which hosts **5 Graduate Schools**, with **over 2,000 students**, **two university restaurants, a technology library**, as well as about 30 companies of advanced technology.

Nantes (600,000 inhab.) is located close to the Atlantic Ocean and is regularly rated as one of the most pleasant French cities to live in. Thanks to its beautiful parks, efficient public transport and other policies for sustainable development, Nantes has been awarded the status of European Green Capital.

For the Master's degree in **Electrical Energy and Microalgae Bioprocess Engineering, courses** are located in Saint-Nazaire, a coastal town of Western-France with several advantages for students on biotechnological fields :

The Gavy campus hosts over 3000 students in various engineering courses (biotechnology, process, structural and electrical), two university restaurants and a university library just located a few meters from the sea.

→ **Travelling to Nantes** from Paris, either from Paris CDG Airport or from the city centre, is easy and direct with fast trains (TGV).

→ **Travelling to Saint-Nazaire** from Paris is easy and direct with fast trains (TGV - 2h30 from Paris) and the region is linked with Nantes Atlantique Airport located in Nantes (40 min from Saint-Nazaire city center).



More information :
www.nantes-saintnazaire.fr

/ ACCOMMODATION

The rent for students' accommodations may vary between €350 and €450 per month (allow for a deposit : usually 1 month rent). The housing market is saturated in September.

It is highly recommended to seek accommodation in June or July. Expect to pay for insurance for any accommodation, as well as the housing tax for accommodation in town.

For students who come from a partner university with Polytech Nantes, please contact **incoming.mobility@polytech.univ-nantes.fr** before next April for possibilities of cheap accommodation in **CROUS Residencies** (approximately 260€ per month).

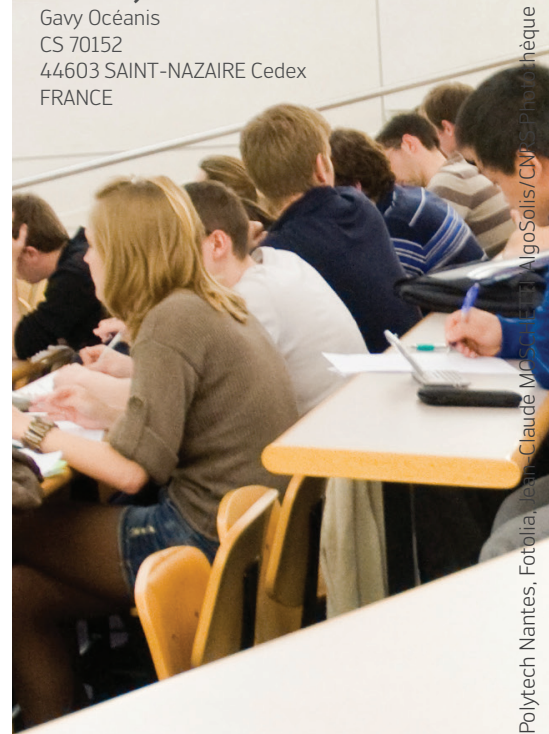
Polytech Nantes is a founding member of the Polytech group, a network of 13 graduate engineering schools, and the graduate engineering of University of Nantes.

Polytech Nantes, 2 campuses for 1 school
The Chantrerie Campus is located at the heart of « Atlanpole », Nantes technology park. Its modern and well-equipped buildings provide an ideal learning environment of engineering students.

Site Chantrerie
Rue Christian Pauc
CS 50609
44306 NANTES Cedex 3
FRANCE

The Gavy Campus is situated in Saint-Nazaire, amongst the aeronautics and shipbuilding industries, benefiting from the exceptional Guérande Peninsula atmosphere and a number of seaside resorts.

Site Gavy
Gavy Océanis
CS 70152
44603 SAINT-NAZAIRE Cedex
FRANCE



Join Polytech Nantes on :

