



## INTERNATIONAL MASTER'S DEGREE

### / THERMAL SCIENCE AND ENERGY

Through this program, students will acquire the scientific and technological knowledge, as well as the practical experience, to understand and contribute to innovative Research and Development processes in the Energy field (Heat Transfer and Fluid Mechanics).

# INTERNATIONAL MASTER'S DEGREE / THERMAL SCIENCE AND ENERGY

**HEAT TRANSFER**  
**FLUID MECHANICS**  
**ENERGY**  
**POLYMERS AND COMPOSITES**

## / SYLLABUS

### First Semester (30 ECTS) :

- Fundamentals of Heat Transfer (Physics and engineering of heat transfer)
- Experimental and digital methods (Experimental methods, Digital methods)
- Fluid mechanics (Fundamentals, Turbulence and turbulent flow, Hydrodynamic instability and Dynamic systems)
- Heat transfer in solids and heterogeneous media (Heat transfer at interfaces, Heat transfer during composite injection, Heat transfer with phase change, Polymers and composite thermophysical properties)
- Energy systems (Thermal energy storage, Energy systems optimization)

### Second Semester (30 ECTS) :

The second semester is dedicated to a full time scientific and technical internship (minimum 5 months) related to a research & development project conducted in academic labs or private companies.

Validations of both the exam session and of the master internship (defense and report) lead to the French Master's Degree from University of Nantes.

## / CAREER OPPORTUNITIES

The master's environment should facilitate future involvement in international PhD top level programs.

This program leads students on to a wide range of R&D functions in many domains where energy management is involved. This can be the case in Energy Production, Transport Industry (aeronautics, automobiles), Building Industry...



## / BUSINESS SECTORS

- Energy
- Mechanics
- Environment
- Sustainable Development

## / HOSTING RESEARCH LABS



## / 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 is at least a 4-year degree in higher education (i.e. a 3-year Bachelor is not acceptable) and should be in one of the following fields : *Applied Physics, Mechanical Engineering, Chemical Engineering*

*Applicants should be able to demonstrate (from transcripts of their degrees) good knowledge in, not necessarily all, but in most of the following fields :*

- Mathematics (Tools for Engineer)
- Thermodynamics
- Heat Transfer
- Fluid Mechanics
- Digital Methods (coding)

## / CONTACT

- Send the requested documents to :  
**master-te@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](http://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](http://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](http://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](mailto: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 :

