RÉPUBLIQUE FRANÇAISE
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UNIVERSITÉ MARIE & LOUIS PASTEUR

UFR STGI BELFORT-MONTBÉLIARD

BAC+5

MASTER

Energy

Specialization: Electrical Engineering

An innovative program

The Energy program aims to train high-level executives in the field of energy within the context of Nord-Franche-Comté region, addressing scientific, economics and social challenges related to energy. The program is strategically located in the urban area of Belfort-Montbéliard, closely linked to the local socio-economic dynamics centered around the Energy valley. Administrative oversight for the two specializations falls under the UFR STGI.

This program offers two specializations: Thermal and energy engineering (ITE) and Electrical Engineering (EE), with the CMI Hydrogen-Energy and Energy efficiency (H3E) integrated into those specializations.

The teaching staff includes teacher-researchers from the FEMTO-ST institute (CNRS UMR 6174) and the scientific and technical resources center FCLAB (CNRS UAR 2200), along with industry professionals.

This program's attractiveness stems from its strong ties to industry and robust research foundations, attracting students nationally and internationally. Graduates find opportunities across France and abroad.

Master's program offered both as a full-time program and through an apprenticeship
Apprenticeship students spend 40 weeks at university and 64 weeks in company

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Internship period
4 to 6 months (from March to August)

Further studies
- Specialized Master's degrees with dual competency acquisition
- PhD program

Objective of the training

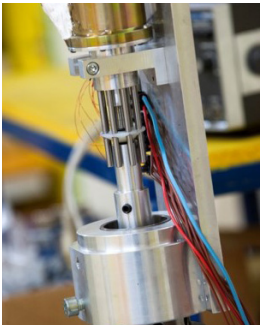
The objective of this training program is to educate engineering-level executives for industries and service sectors within the electrical energy field, as well as research engineers for research careers and R+D services in the electrical energy industries. The two main specializations of the program focus firstly on the production and transportation of electrical energy, particularly from renewable energies and hydrogen, and secondly on the use of electrical energy in terrestrial or aerial transportation.

Graduates primarily find employment abroad in neighboring countries (such as Switzerland, Germany, Belgium, Luxembourg), and to a lesser extent in Canada, for example, at the Université du Québec at Trois-Rivières (UQTR) and Université du Québec at Chicoutimi (UQAC).

Contract types (fixed-term or permanent) depend on the economic conditions for the first job. After graduation, around 80% of graduates are employed on fixed-term or permanent contracts, and after 30 months, more than 90% are employed on permanent contracts.

The industrial sectors in which these professionals operate are highly diversified:
- Electrical energy
- Hydropower
- Hydrogen
- Renewable energy
- Environmental studies
- Transportation (automotive, rail, aerospace, maritime...)
- Design of electric actuators with their power electronics and controls

A professional from this training program:
- conducts applied research, studies, and tests in industrial or academic environment.
- manages projects related to the fields of electrical engineering, electronics, and automotive technology.
- implements energy production systems (energy conversion, control/command systems).
- manages projects and business affairs in electrical engineering.

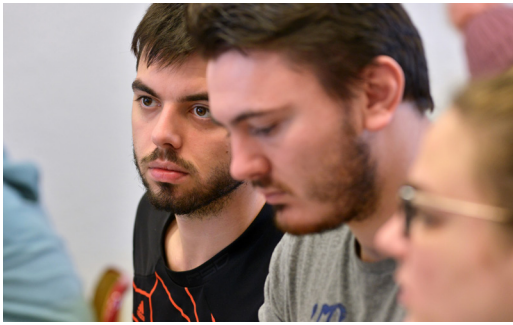


Academic content

- Mastering energy production systems, particularly those from renewable sources or utilizing hydrogen-energy vectors.
- Modeling multiphysical systems to manage energy flows.
- Mastering electrical energy storage systems.
- Mastering electric or hybrid electric propulsion systems.
- Designing electric actuators, electric drives, and fuel cell systems.
- Mastering conventional electricity production systems and electrical renewable energies.

Profile

• M1: students holding a Bachelor's degree in a related field or equivalent
• M2: students holding a first-year master's degree in the same field or an engineering degree
• Possibility of Recognition of Prior Learning through professional experience



Career opportunities

Career opportunities typically include:
• R+D engineer (in private or public sector)
• Study and/or design engineer
• Test/measurement engineer
• Technical manager in research and development
• Technical sales engineer
• Project or installation manager
• Business development manager
• Manager of a testing and/or qualification laboratory
• Consultant

Training content

First year

• Industrial sphere:
  • English
  • Professional communication
  • Project management
  • Economics of energy transition
• Electric actuators
• Power electronics
• Automation
• Hydrogen and energy storage
• Electric and hybrid traction chains
• Renewable energy power plants

Second year

• Industrial sphere:
  • English
  • Legal and economic culture
  • Entrepreneurship
• Modeling and control of energy systems
• AI applied for energy systems
• Development of (semi-)analytical and numerical multiphysical models

Advantages:
• Individualized support throughout the program (each semester over 2 years)
• Tutored projects (each semester over 2 years) on energy systems related to the Thermal Engineering specialization.
• A practical internship (24 weeks, excluding apprenticeship periods, in the final semester of the second year) in a company or laboratory.
• Apprenticeship program in companies (each semester over 2 years).

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Find all the information on our website:
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