

# Master's Degree in Energy

## Major in Electrical Energy

- > Are you passionate about science and energy ?
- > Would you like to design innovative electrical systems ?

This training is for you !



INTERNSHIP PROJECT  
CONTROL  
**ELECTRICAL**  
FUEL CELL  
POWER TRAIN

ENVIRONMENT  
RENEWABLE ENERGY  
EFFICIENCY  
**ENERGY**  
(ENERGY) CARRIER  
HYDROGEN ENERGY

ELECTRICAL MACHINES  
WORK-STUDY PROGRAM

STORAGE PRODUCTION

# Master's Degree in Energy

## Level of the validated degree :

Baccalauréat +5  
Master's degree

## Internship period

4 to 6 months  
(from March to August)

## Training program location :

Département  
Sciences et Energie  
à l'UFR STGI BELFORT  
2 rue Chantereine

## Registration :

[http://formation.univ-fcomte.fr  
/master/energie-ingenierie-thermique-et-energie](http://formation.univ-fcomte.fr/master/energie-ingenierie-thermique-et-energie)

## Contact :

### Student affairs office:

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### Head of the Master's degree :

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### Head of the Master of Engineering H3E Hydrogen Energy & Energy Efficiency :

Nadia STEINER

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### Objectives of the training program :

This degree in Energy aims to train students in order to be high-level executives in the field of energy. It is part of the North-Franche-Comté dynamic on the scientific, economic and societal issues of energy. It is based on two majors: an Electrical Energy major and a Thermal Energy and Engineering major. The Master of Engineering H3E Hydrogen Energy & Energy Efficiency is based on these courses.

### A successful graduate will know :

- how to master energy production systems, in particular those of renewable origin or using the hydrogen-energy vector,
- how to model multi-physical systems, in order to manage energy flows,
- how to master electrical energy storage systems,
- how to master the electric or hybrid electric propulsion chains of land vehicles (rail or motor),
- how to design electric actuators, electric drives and fuel cell systems

### Target audience

- Students holding a bachelor's degree in the same field or equivalent in M1;
- Master's degree in the same field or engineering degree for access to M2;
- Possibility of access through the V.A. (validation of prior learning) / V.A.E (validation of prior experience) process.

**Master in initial and work-study training. The work-study students are present 40 weeks at UFC and 64 weeks at the company.**

### Job opportunities

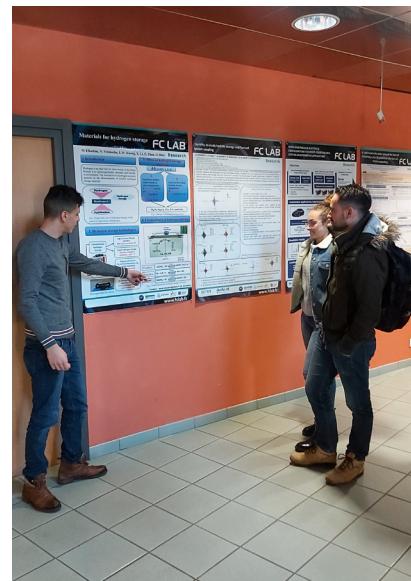
- Engineering responsibilities (studies, calculations, research, R&D, testing, consulting),
- Project management responsibilities (project manager or «chargé d'affaires»)
- Research.

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## Master's degree 1st year – ELECTRICAL ENERGY

Core courses	Type	CM	TD	TP	Total
Semester 07	Comput.				
UE1 - Automation	Oblig.	32	26	20	78
UE2 - Electric actuators	Oblig.	14	22	32	68
UE3 - Power electronics	Oblig.	32	26	20	78
EU4 - Engineering Sciences	Oblig.	36	16	9	60
System acoustics and vibration	Choice	34	14	12	60
Mathematical tools for engineers	Choice	37	17	6	60
EU5 - Industrial world	Oblig.				
Expression and communication	Oblig.	18			18
English	Oblig.	20			20
Integrating project	Oblig.				
Semester 08	Comput.				
EU6 - Human and Social Sciences	Oblig.	42	32		74
English	Oblig.	20			20
General culture and Personalized professional project (PPP)	Oblig.	12	6		18
Occupational risk management and safety	Oblig.	12	6		18
Innovation management	Oblig.	18			18
EU7 - Industrial IT	Oblig.	18	22	28	68
Digital Signal Processors	Oblig.	10	12	16	38
Digital Signal Processing	Oblig.	8	10	12	30
EU8 - H2 and energy storage	Oblig.	32	20	16	68
EU9 - Simulation tools	Oblig.	4	64		68
EU10 - Integrator project	Oblig.				

'Parcours CMI' (Master of Engineering H3E [Hydrogen Energy & Energy Efficiency] curriculum)	Comput.				
Semester 07	Comput.				
EU CMI - Introduction to business management	Oblig.	10	46		56
Management, the company and its markets	Oblig.	10	8		18
EU CMI - Energy systems and hydrogen energy	optional.	22	9	9	40
Energy sector	Oblig.	8	2		10
Fuel Cell	Oblig.	8	4	3	15
Thermics of electrical machines	Oblig.	6	3	6	15
Semester 08	Comput.				
EU CMI - Energy storage and conversion	Oblig.	36	12	12	60
Energy conversion and energy efficiency	Oblig.	12	4	4	20
Energy networks	Oblig.	12	4	4	20
Energy storage	Oblig.	12	4	4	20



## Master's degree 2<sup>nd</sup> year – ELECTRICAL ENERGY

Core courses	Type	CM	TD	TP	Total
Semester 09	Comput.				
EU1 - Human and Social Sciences	Oblig.	6	44		50
English	Oblig.	20			20
General knowledge and C2I2 (IT and internet Certificate)	Oblig.	6	12		18
Entrepreneurship	Oblig.	12			12
UE2 - Modeling and control of the energy system	Oblig.	18	18	20	56
EU3 - Management and optimization of energy systems	Oblig.	12	12	16	40
UE4 - Advanced magnetic device modeling	Oblig.	16	20	28	64
UE5 - Design of magnetic devices	Oblig.	10	10	12	32
Semester 10	Comput.				
EU6 - Integrator project	Oblig.				
EU7 - Internship	Oblig.				



'Parcours CMI' (Master of Engineering H3E [Hydrogen Energy & Energy Efficiency] curriculum)	Comput.				
Semester 09	Comput.				
EU CMI - Clean and sustainable energy production	Oblig.	30	12	18	60
Advanced cogeneration	Oblig.	10	4	6	20
Advanced PAC systems	Oblig.	10	4	6	20
Macroscopic energy representation	Oblig.	10	4	6	20
Semester 10	Comput.				
EU CMI - Socio-economic environment	Oblig.	24	6		30
Corporate culture	Oblig.	12	3		15
Management	Oblig.	12	3		15

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