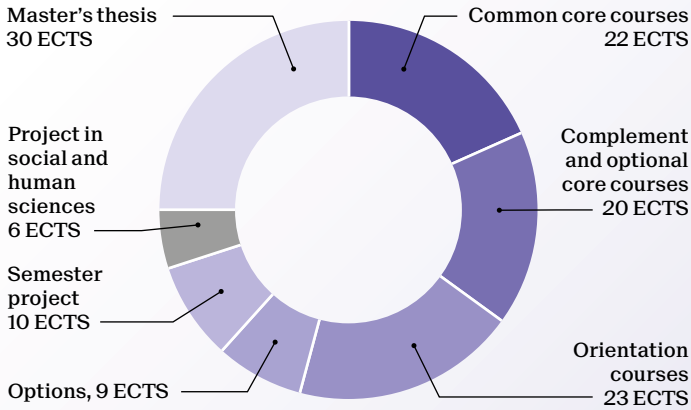


# Master of Science in Energy Science and Technology

2-year program - 120 ECTS



## Orientation courses 23

Orientation A "Energy conversion devices"	
Advanced lab in electrical energy systems	4
Electromagnetic compatibility	2
Energy storage systems	3
Engines and fuel cells	4
Environmental transport phenomena	5
Industrial automation	3
Industrial electronics I	4
Industrial electronics II	4
Ouvrages hydrauliques et aménagements hydroélectriques	3
Solar energy conversion devices and plants	3
Turbomachines thermiques	5

Orientation B "Energy systems"	
Advanced control systems	3
Advanced energetics	5
Bioclimatic buildings and districts	2
Building energetics	3
Model predictive control	3
Modelling and optimization of energy systems	4
Planification intégrée des infrastructures d'énergie	3
Power systems dynamics	3
Renewable energy (for ME)	4
Smart grids technologies	5

Orientation C "Energy management and sustainability"	
Applied data analysis	6
Development engineering	4
Distributed intelligent systems	5
Material and energy flow analysis	4
Planification intégrée des infrastructures d'énergie	3
Power system restructuring and deregulation	3
Sanitary engineering in developing countries	2
Sustainability assessment of urban systems	3
Water and wastewater treatment	5

Options 9	
Optional courses	9
Project in energy II	9

## Industrial internship

The program includes a compulsory industrial internship with a minimal duration of 8 weeks.

	Credits
<b>Common core courses</b>	<b>22</b>
Convex optimization and applications	4
Electrochemical engineering	3
Energy conversion and renewable energy	3
Energy supply, economics and transition	2
Fundamentals & processes for photovoltaic devices	3
Hydraulic turbomachines	4
Thermal power cycles and heat pump systems	3

## Complement 20

Students must follow levelling courses depending on their background and choose additional optional core courses to reach 20 ECTS.

EE: students with background in Electrical Engineering  
ME: students with background in Mechanical Engineering  
SIE: students with background in Environmental Science and Engineering

Additional mandatory courses for EE:	
Heat and mass transfer	4
Life cycle assessment in energy systems	3

Additional mandatory courses for ME:	
Fundamentals of electrical circuits and systems	4
Principles of power systems	2
Life cycle assessment in energy systems	3
Semiconductor devices I	4

Additional mandatory courses for SIE:	
Fundamentals of electrical circuits and systems	4
Heat and mass transfer	4
Principles of power systems	2
Semiconductor devices I	4

Additional mandatory courses for other students:	
Fundamentals of electrical circuits and systems	4
Heat and mass transfer	4
Life cycle assessment in energy systems	3
Principles of power systems	2
Semiconductor devices I	4

## Optional core courses 3 to 13

CLUSTER "Electrical Engineering"	
Fundamentals of electrical circuits and systems	4
Industrial electronics I	4
Principles of power systems	2
Semiconductor devices I	4

CLUSTER "Mechanical Engineering"	
Advanced heat transfer	3
Heat and mass transfer	4
Hydroacoustique pour aménagements hydroélectriques	3
Hydropower plants: generating and pumping units	2
Two-phase flows and heat transfer	3

CLUSTER "Basic sciences"	
Applied machine learning	4
Discrete optimization	5
Energy systems engineering	3
Nuclear fusion and plasma physics	4
Thermodynamics of energy conversion and storage	3

CLUSTER "Policy and socio-economic aspects"	
Air pollution and climate change	5
Life cycle assessment in energy systems	3
Lifecycle performance of product systems	3
Negotiation techniques	2
Principles of finance	4
Principles of microeconomics	4
Recycling of materials	2
Solid waste engineering	4
Technology policy and the energy transition	2
Water resources engineering	5

## Entry requirements

Candidates should have a Bachelor's degree from a reputable university and excellent academic performance. The strong interdisciplinary character of the Master's degree in Energy Science and Technology is reflected in the fact that the program is open to a wide range of Bachelor's degree holders in applied sciences and engineering, including but not limited to electrical, mechanical, environmental sciences and engineering.

School of Engineering  
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