Master’s thesis
30 ECTS

Common core courses
22 ECTS

Levelling courses
(depending on the student’s background)
20 ECTS

Projects
16 ECTS

Optional courses
9 ECTS

Orientation courses
23 ECTS

Entry Requirements

The program includes a minimum 8-week long compulsory internship.
A longer internship may be done instead of a specialization or in combination with the Master’s thesis.

Common core courses
20
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

Levelling courses
20
The Master is designed to welcome students from various bachelors and has a dedicated teaching program aimed to bridge the gap between different students’ backgrounds.
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: 7
Heat and mass transfer 4
Life cycle assessment in energy systems 3

Additional mandatory courses for ME: 13
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: 11
Heat and mass transfer 4
Life cycle assessment in energy systems 3

Additional mandatory courses for other students: 17
Fundamentals of electrical circuits and systems 4
Life cycle assessment in energy systems 3
Principles of power systems 2
Semiconductor devices I 4

Optional core courses
3 to 13

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

Projects
16
Project in energy 10
Project in human and social sciences 6

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