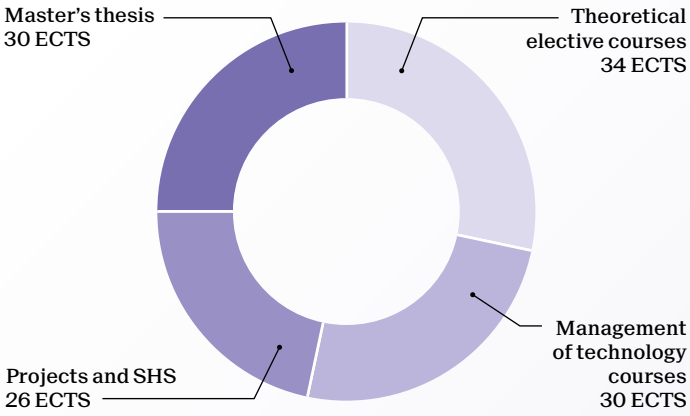
ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Master of Science in

ENERGY MANAGEMENT AND SUSTAINABILITY

2-year program - 120 ECTS



This program includes a minimum 8-week compulsory internship in industry.

Research

Research activities focuse on the following areas:

- Structural wind engineering
- Energy
- Water resources
- Urban design and environment
- Transportation

Professional outlook

This new project-focused curriculum is built on scientific rigor and professional practice, to provide a unique, interdisciplinary training in energy management and sustainability. The new generation of problem solvers will be able to understand complex systems such as smart grids for electricity distribution, water dissemination systems, environmental services and electronic networks that control energy consumption. And ultimately, to be able to both maximize their efficient use and minimize their negative impact on society.

Curriculum

Strong emphasis will be placed on dealing with engineering tasks, taking into consideration important technical, economical, environmental, safety and social constraints. Students will also gain valuable skills in project management.
Multidisciplinary projects are proposed at the beginning of the program, and a tutor is assigned for each project. Students will work in a team to address these projects. An industrial internship will provide practical experience in a professional setting.
The elective subjects are to be chosen in the course catalogue of the EPFL School of Engineering and School of Architecture, Civil and Environmental Engineering.

Entry requirements

Candidates should hold a Bachelor's degree in Engineering or Applied Physics.

Career prospects

Graduates from the MES program form a new and unique generation of professionals who will be called upon to tackle critical issues in energy management and sustainability. They are distinguished by their technical and management knowledge and the skills required to deal with a wide range of issues at the interface between energy, technology, and business. At the beginning of their career, they can be hired by any company that deals with energy; in project management, R&D, innovation management, and project development. The first batch of graduates have been hired by companies such as ABB, BKW, public and non-governmental organizations, and consulting companies, and some have even launched their own start-up in the UAE.

master.epfl.ch/energy
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	Credits
Theoretical elective courses	**34**
Environmental Chemistry and Bioprocess Engineering	
Air pollution and climate change	5
Applied wastewater engineering	3
Energy conversion and renewable energy	3
Fate and behaviour of organic pollutants	4
Groundwater and soil remediation	4
Sanitary engineering in developing countries	2
Solid waste engineering	4
Water and wastewater treatment	5
Natural Water, Soil and Ecosystems Engineering	
Environmental Transport phenomena	5
Hydrogeophysics	4
Urban hydraulic systems	3
Water quality modeling	4
Water resources engineering	5
Environmental Monitoring and Modeling	
Distributed information systems	4
Distributed intelligent systems	5
Fundamentals of traffic operations and control	3
Geocomputation	3
Geomonitoring	5
Introduction to database system	4
Sensor orientation	4
Spatial statistics and analysis	5
Energy	
Advanced control systems	3
Advanced energetics	5
Computer-aided engineering	5
Énergétique du bâtiment	3
Energy storage systems	3
Engines and fuel cells	4
Fracture mechanics	4
Fundamentals and processes for photovoltaic devices	3
Hydraulic turbomachines	4
Hydrodynamics	5
Hydropower plants: generating and pumping units	2
Industrial electronics I, II	5
Instability	3
Large-area electronics: devices and materials	3
Materials selection	2
Modélisation des systèmes énergétiques	3
Modélisation des systèmes de transports	3
Modelling and optimization of energy systems	4
Numerical flow simulation	5
Numerical methods in heat transfer	3
Power system restructuring and deregulation	3
Power systems dynamics	3
Production management	5
Smart grids technologies	2
Thermal power cycles and heat pump systems	2
Turbulence	3
Two-phase flows and heat transfer	5
Various other domains	
Advanced Fossil and Renewable Energy Systems	4
Advanced machine learning	4
Analog circuits design I, II	4
Analyse et management des risques industriels	3
Catalysis for energy storage	2
Commande d'actionneurs à l'aide d'un microprocesseur + TP	2
Commande non linéaire	3
Études d'impact	3
Habitat et développement urbain	3
Intelligent agents	6
Mathematical modelling of behavior	4
Model predictive control	3
Planification intégrée des infrastructures d'énergie	3
Process development I, II	4
Real-time networks	3
Recycling of materials	2
System identification	3
Management of technology courses	**30**
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Courses of the minor "Science, Technology, and Area Studies"	
Projects and SHS	**26**
Project in energy management and sustainability I, II	20
Project in human and social sciences	6