EPFL

Master of Science in
MECHANICAL ENGINEERING

2-year program - 120 ECTS

Master's thesis
30 ECTS

Options, 74 ECTS

Project in social and human sciences
6 ECTS

Semester project
10 ECTS
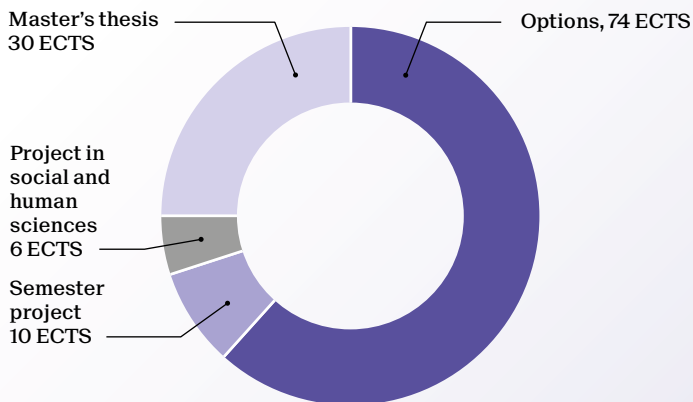
Industrial internship

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

The program can be built around one of the following specializations (30 ECTS necessary):

A Fluid mechanics
B Automatic and systems
C Design and production
D Thermal sciences
E Mechanics of solids and structures
F Biomechanics

Students can also choose a 30 ECTS minor (included in the 120 ECTS). Recommended minors with this program:

- Biomedical technologies
- Computational science and engineering
- Energy
- Management, technology and entrepreneurship
- Materials science
- Space technologies

Career prospects

Due to the omnipresence of mechanical components in the objects that we use in our day-to-day lives, mechanical engineering training offers a great variety of future prospects. At the top of the list, we find the construction domain (including the car industry, shipbuilding, aeronautics or aerospace), but also the machine industry and energy conversion and management.

A large number of students decide to join large corporations and have the opportunity to specialize in the design of new products, at a production or even at a marketing level.

In that case, their role will consist in targeting new markets and advising customers. Other students will have the chance to combine all these tasks if they decide to join smaller entities, or if they choose to create their own structure, since the innovation spectrum in mechanical engineering is quite extended. Another important factor to underline is that the mechanical engineering training is world-recognized and allows students to plan a career abroad.

School of Engineering
go.epfl.ch/master-mechanical-engineering
contact: sgm@epfl.ch

Options in mechanical engineering	A	B	C	D	E	F	Credits 74
Advanced control systems		B	C	D	E	F	3
Advanced design for sustainable future			C				5
Advanced energetics				D			5
Advanced heat transfer				D			3
Aerodynamics	A			D	E		4
Aéroélasticité et interaction fluide-structure	A			D	E		3
Applied mechanical design			C		E		5
Biomechanics of the cardiovascular system	A				E	F	3
Biomechanics of the musculoskeletal system					E	F	5
Cavitation et phénomènes d'interface	A			D			3
Commande non linéaire		B	C		E	F	3
Continuous improvement of manufacturing systems			C				5
Data-driven design and fabrication methods		B	C				3
Dynamic finite element analysis of structures					E		3
Engines and fuel cells	A			D			4
Heat pump systems				D			3
Hydraulic turbomachines	A			D			4
Hydroacoustic for hydropower plants	A			D		F	3
Hydrodynamics	A			D	E	F	5
Instability	A						3
Introduction to additive manufacturing			C				3
Introduction to nuclear engineering				D			2
Liquid-gas interfacial heat and mass transfer	A			D			3
Mechanical product design and development			C		E		5
Mechanics of slender structures					E	F	5
Mechanics of soft and biological matter					E	F	4
Mechanobiology: how mechanics regulate life						F	4
Micro/Nanomechanical devices		B	C		E		4
Micro/Nano robotics		B	C		E	F	3
Model predictive control		B					4
Modeling and optimization of energy systems		B		D			4
Multiagent decision-making and control		B					4
Multivariable control		B					4
Nano-scale heat transfer				D			4
Networked control systems		B					3
Numerical flow simulation	A			D		F	5
Numerical methods in biomechanics						F	3
Product decarbonization and life cycle analysis			C	D			4
Production management			C				5
Projet génie mécanique II			C	D	E		10
Renewable energy	A			D			4
Solar energy conversion				D			4
System identification		B	C	D		F	3
Thermal power plants				D			3
Turbulence	A						5

Options in other programs	A	B	C	D	E	F	
Advanced additive manufacturing technologies			C		E		4
Advanced composites in engineering structures					E		3
Assembly techniques					E		2
Basics of mobile robotics		B					4
Basics of robotics for manipulation		B	C				3
Biophysics: physics of biological systems						F	4
Biophysics: physics of the cell						F	3
Capteurs		B			E		5
Commande embarquée de moteurs		B					3
Composites polymères + TP					E		4
Composites technology					E		3
Computational motor control		B				F	4
Computational optical imaging							4
Computer simulation of physical systems I	A						4
Continuum mechanics and applications					E		6
Convex optimization		B					5
Corrosion et protection des métaux + TP			C				3
Déformations des matériaux					E		4
Distributed intelligent systems		B					5
Dynamical system theory for engineers		B					6
Energy and comfort in buildings				D			5
Energy geostructures				D			4
Environmental transport phenomena	A						5
Industrial automation		B					3
Innovation and entrepreneurship in engineering							10
Laser microprocessing			C				2
Legged robots		B					4
Machine learning I		B					4
Machine learning II		B					4
Machine learning for predictive maintenance applications			C				6
Machine learning programming		B					2
Materials selection					E		3
Multiscale modeling of solids					E		4
Nonlinear analysis of structures					E		6
Numerical approximation of PDEs	A						5
Physiologie par systèmes						F	4
Polymer science					E		3
Sensors in medical instrumentation						F	3
Surface analysis			C				3
Systèmes embarqués microprogrammés		B					4
Thermodynamics of comfort in buildings				D			3
Towards sustainable materials			C				4
Tribology					E		2