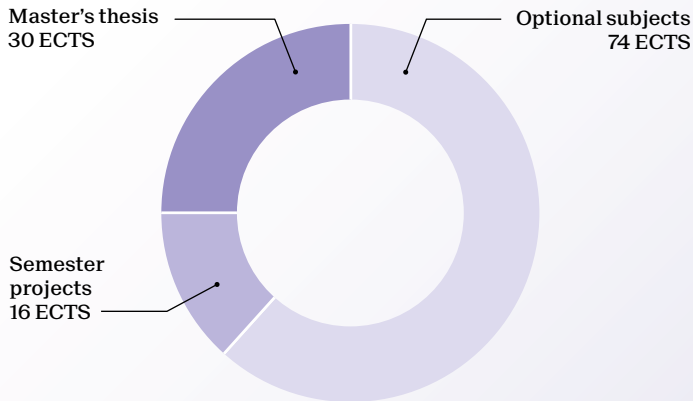


## Master of Science in MECHANICAL ENGINEERING

2-year program - 120 ECTS



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

The program must be built around one of the following orientations:

- A Aero-Hydrodynamics
- B Control and Mechatronics
- C Design and Production
- D Energy
- E Mechanics of Solids and Structures
- F Biomechanics

Students can also choose a 30 ECTS Minor (incl. in the 120 ECTS credits):

- Biomedical Technologies
- Computational Science & Engineering
- Energy
- Materials Science
- Space Technologies
- Management, Technology and Entrepreneurship
- Science, Technology and Area Studies

School of Engineering  
[master.epfl.ch/mechanicalengineering](http://master.epfl.ch/mechanicalengineering)  
 contact: [sgm@epfl.ch](mailto:sgm@epfl.ch)

	Orientation						Credits
	A	B	C	D	E	F	
<b>Optional subjects</b>							<b>74</b>
Advanced additive manufacturing technologies			C				3
Advanced control systems		B	C	D	E	F	3
Advanced energetics				D			5
Advanced heat transfer				D			3
Advanced solid mechanics			C		E	F	5
Aerodynamics	A			D	E		3
Aéroélasticité et interaction fluide-structure	A			D	E		3
Applied mechanical design			C				4
Bases de la robotique		B	C				3
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
Composites polymères + TP					E		4
Computational multi-scale modeling of solids					E	F	5
Conception mécanique intégrée			C		E	F	5
Dynamique numérique des solides et des structures	A		C		E	F	5
Engines and fuel cells	A			D			4
Experimental methods in engineering mechanics	A				E	F	4
Fundamentals of computer aided manufacturing			C				5
Fracture mechanics			C		E	F	3
Hydraulic turbomachines	A			D			4
Hydrodynamics	A			D	E	F	5
Hydrodynamique acoustique	A			D		F	3
Instability	A						3
Introduction to additive manufacturing			C				3
Introduction to nuclear engineering				D			2
Lifecycle performance of product systems			C	D			3
Mechanical product design and development			C				4
Mechanics of slender structures					E	F	4
Micro/Nano robotics			C		E	F	3
Micro/Nanomechanical devices			C		E		3
Modelling and optimization of energy systems				D			4
Model predictive control		B					3
Multivariable control		B					3
Multi-body simulation		B	C		E	F	3
Networked control systems		B					3
Numerical flow simulation	A			D		F	5
Numerical methods in biomechanics						F	3
Numerical methods in heat transfer							3
Particle-based methods	A				E	F	4
Production management			C				5
Project in mechanical engineering II							10
Renewable energy	A			D			4
Robotique industrielle et appliquée		B	C				2
Simulation and performance analysis in production		B	C				4
Systèmes mécatroniques		B	C				5
System identification		B	C	D		F	3
Thermal power cycles and heat pump systems				D			2
Turbomachines thermiques	A			D			5
Turbulence	A						3
Two-phase flows and heat transfer	A			D			3
<b>Semester projects</b>							<b>16</b>
Project in mechanical engineering I							10
Project in human and social sciences							6

## 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.