EPFL

Master of Science in
MICROENGINEERING

2-year program - 120 ECTS

- Products design and systems engineering 10 ECTS
- Basics for orientations 15 ECTS
- Options 39 ECTS
- Semester projects 20 ECTS
- Project in social and human sciences 6 ECTS
- Master's thesis 30 ECTS
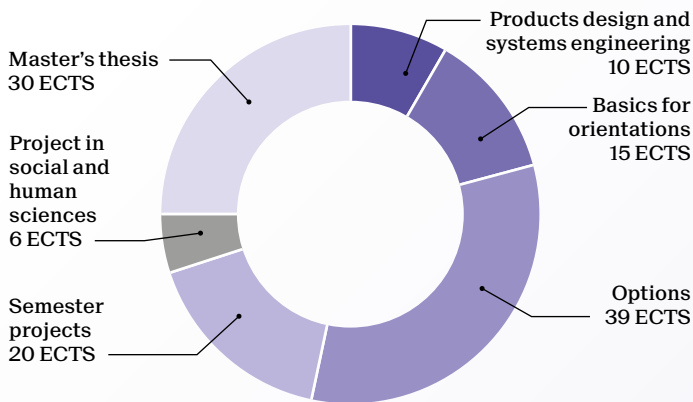
Industrial internship

The program includes a compulsory 8-week internship which can be extended to 6 months and/or combined with the Master's thesis.

Students may organize their study plan around one of the following orientation:
- Optics and photonics
- Micro and nanosystems
- Production and advanced manufacturing

They may choose a 30 ECTS minor within the optional courses. Recommended minors with this program:
- Biomedical technologies
- Imaging
- Photonics

Admission criteria

EPFL Bachelor's degree in Microengineering.

A Bachelor's degree in Computer Science, Electrical Engineering, Mechanical Engineering, or any related field with an interdisciplinary background and an excellent academic record may also be accepted. However, candidates must master at least two of the three following fields: computer science, electronics, and mechanical engineering. Additional credits to fill any gaps may be required.

Career prospects

The EPFL MSc in Microengineering opens a broad range of career opportunities in research departments and manufacturing units over the entire industry spectrum, from start-ups to multinational groups. Microengineers are highly sought after in high-tech sectors, where their solid and broad profile empowers them to lead research and development, as well as to oversee production in industries ranging from aerospace and medtech to the watch industry.

School of Engineering
go.epfl.ch/master-microengineering
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	Orientations			Credits
	A	B	C	
Basics for orientations				**15**
Advanced MEMS & microsystems		B		3
Applied and industrial robotics			C	2
Applied machine learning	A	B	C	4
Apprentissage et intelligence artificielle	A	B	C	4
Fundamentals & processes for photovoltaic devices	A	B	C	3
Imaging optics	A			3
Introduction to additive manufacturing			C	3
Laser fundamentals and applications for engineers	A	B		3
Manufacturing systems and supply chain dynamics			C	3
Materials processing with intelligent systems			C	3
Metrology	A	B		3
Micro/Nanomechanical devices		B	C	4
Nanotechnology	A	B		3
Optical design with ZEMAX	A			3
Optical detectors	A	B		3
Scaling laws in micro & nanosystems		B		2
Selected topics in advanced optics	A			3
Smart sensors for IoT		B	C	3

Options				**39**
Advanced A/MS VLSI: A-to-D Converter		B		3
Advanced additive manufacturing technologies			C	3
Advanced analog integrated circuit design		B	C	3
Fundamentals of integrated photonic components	A	B		4
Advanced control systems				3
Advanced machine learning	A	B	C	4
Advanced mecanisms for extreme environments		B	C	3
Advanced satellite positioning				4
Aerial robotics				4
Analyse de produits et systèmes			C	2
Applied biomedical signal processing				4
Architecture software				3
Audio				3
Basics of mobile robotics				4
Biomedical optics	A			3
Biomicroscopy I,II	A			7
Bio-nano-chip design		B		3
Bioimage informatics				4
Commande embarquée de moteurs			C	3
Commande non linéaire			C	3
Computational motor control			C	4
Continuous improvement of manufacturing systems			C	5
Deep learning for optical imaging	A			3
Distributed intelligent systems				5
Energy supply, economics and transition	A	B	C	2
Evolutionary robotics				3
Fundamentals of analog & mixed signal VLSI design		B		4
Fundamentals of biophotonics	A			3
Fundamentals of biosensors and electronic biochips		B		3
Haptic human robot interfaces			C	3
Analog IC design		B		3
Image processing I, II				6
Industrial automation			C	3
Introduction to bioengineering				3
Intercultural presentation skills				2
Lab on app development for tablets and smartphones				4
Large-area electronics: devices and materials		B	C	3
La science quantique : une vision singulière	A	B		3
Laser microprocessing			C	2
Lasers: theory and modern applications	A	B		4
Legged robots				4
Machine learning programming				2
Management de projet et analyse du risque				4
Materials and technology of microfabrication		B	C	3
MEMS practicals I, II		B	C	4
Metrology practicals	A	B		2
Model predictive control				4
Nanobiotechnology		B		3
Nanophotonics	A	B		3
Neural interfaces		B		6
Neural signals and signal processing				6
Nonlinear optics	A			3
Nonlinear optics for quantum technologies	A			4
Optics laboratories (autumn / spring)	A			6
Organic and printed electronics		B	C	2
Photonic systems and technology	A	B		4
Physical models for micro and nanosystems		B		2
Physics of photonic semiconductor devices	A	B		4
Physique des composants semiconducteurs	A	B		3
Quantum and nanocomputing	A	B		6
Radio frequency circuits design techniques		B		4
Sensors in medical instrumentation		B		3
Space mission design and operations				2
System identification			C	3
System programming for Systems-on-chip				6
Systems engineering				3
Classical and quantum photonic transducers	A	B		3
Translational neuroengineering				6