Master of Science in
MICROENGINEERING

2-year program - 120 ECTS

- Master's thesis 30 ECTS
- Core courses 12 ECTS
- Compulsory module 12 ECTS
- Optional courses 40 ECTS
- Projects 26 ECTS
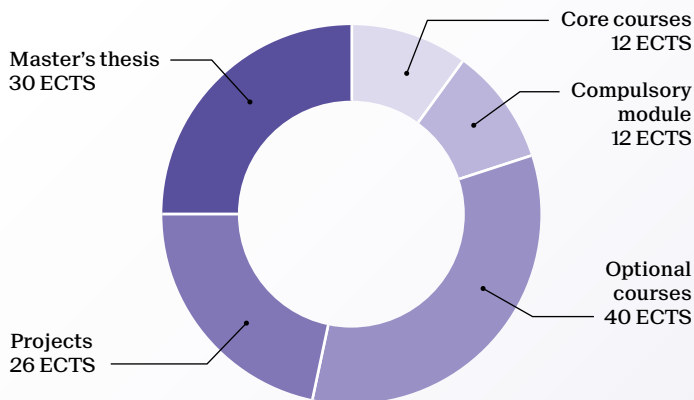
Possible Minors:
- Biomedical Technologies
- Computational Science & Engineering
- Energy
- Management, Technology and Entrepreneurship
- Science, Technology and Area Studies
- Space Technologies

Possible Specializations:
A Optical Engineering
B Micro- and Nanosystems
C Robotics

Industrial internship
The program includes a minimum 8-week long compulsory internship.

	Track			Credits
Core courses:				**12**
Product design: managing projects and innovations				3
Product design in a team				5
Systems engineering				4

	Track			Credits
Compulsory module				**12**
Optical Engineering	A			12
Image optics				3
Optical Detectors				3
Optics laboratories				3
Selected topics in advanced optics				3
Micro- and Nanosystems		B		12
Advanced MEMS				3
Materials & Technology of microfabrication				3
Modeling and simulation of microsystems				3
Nanotechnology				3
Robotics			C	12
Applied machine learning				4
Mobile robots				4
Robotics practicals				2
Robotique industrielle et appliquée				2

	Track			Credits
Optional courses according to compulsory module	minimum of 10 credits			**10**
Advanced MEMS	A		C	3
Applied machine learning	A	B		4
Bases de la robotique	A	B	C	3
BioMEMS	A	B	C	2
Flexible bioelectronics	A	B	C	3
Image optics		B	C	3
Image processing I, II	A	B	C	6
Materials & Technology of microfabrication	A	B	C	3
Microelectronics	A	B	C	2
Mobile robots	A	B		4
Modeling and simulation of microsystems	A		C	3
Nanotechnology	A		C	3
Optical detectors		B	C	3
Robotique industrielle et appliquée	A	B		2
Scaling laws in micro- and nanosystems	A	B	C	2
Selected topics in advanced photonics		B	C	3
Stochastic methods	A	B	C	2
Techniques d'assemblage	A	B	C	3

	Track			Credits
Free optional courses				**30**
Advanced control systems	A	B	C	3
Advanced machine learning			C	4
Advanced satellite positionning			C	4
Analog circuit design I, II		B		4
Analyse de produits et systèmes		B		2
Audio	A	B	C	3
Biomedical optics	A			3
Biomicroscopy I, II	A			7
Circuits intégrés I		B		3
Commande d'actionneurs à l'aide d'un microprocesseur + TP			C	2
Commande non linéaire			C	3
Computational motor control			C	4
Computer-aided engineering			C	5
Distributed intelligent systems (pas donné 2016-17)		B	C	5
Evolutionary robotics			C	4
Fab/sim practicals		B		2
Fabrication assistée par ordinateur			C	5
Fundamentals and processes for photovoltaïc devices	A	B	C	3
Fundamentals of biophotonics	A			3
Haptic human robot interfaces			C	3
Integrated optics	A			3
Large-area electronics: devices and materials	A	B	C	3
Laser microprocessing	A	B	C	2
Lasers : theory and modern applications				4
Machine learning programming	A		C	2
Model predictive control		B	C	3
Nano/Advanced MEMS practicals	A	B	C	2
Nanobiotechnology and biophysics	A	B		3
Optical communications	A			3
Opticalwave propagation	A			3
Optics laboratories II	A			3
Photomedicine	A			2
Photonic micro- and nanosystems	A	B		2
Photonic systems and technology	A			4
Physics of photonic semiconductor devices	A			4
Printed systems and large area manufacturing	A	B	C	2
Propagation of electromagnetic waves	A			2
Quantum electrodynamics and quantum optics	A			4
Quantum optics and quantum information	A			4
Sensors in medical instrumentation	A	B	C	3
Space mission design and operations		B	C	2
System identification			C	3
Transducteurs et entraînements intégrés			C	3

A **Specialization** in Track A, B or C is delivered if 30 ECTS are obtained within a track.

				Credits
Projects				**26**
Projet microtechnique I, II				20
Project in human and social sciences				6

School of Engineering
master.epfl.ch/microengineering
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