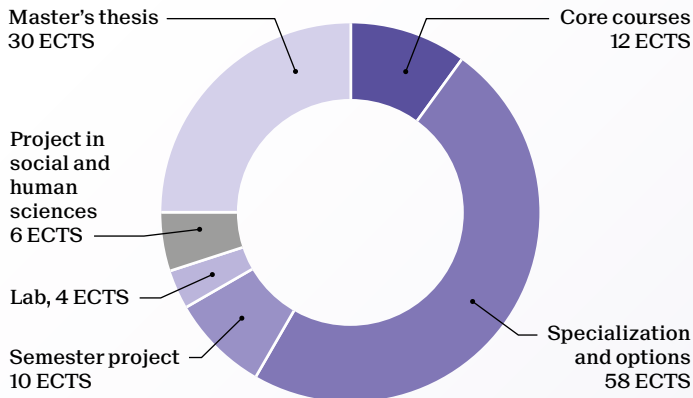


Master of Science in ELECTRICAL AND ELECTRONIC ENGINEERING

2-year program - 120 ECTS



	Specialization					Credits
Core courses (min. 12 credits)	H	I	J	K	L	
Convex optimization				K		5
Fundamentals of analog VLSI design	H	I				4
Fundamentals of inference and learning			J	K	L	4
Semiconductor devices I	H	I				4
Smart grids technologies						5
Wireless receivers: algorithms and architectures					L	4

Lab	H	I	J	K	L	4
Lab in acoustics						4
Lab in advanced VLSI design	H					4
Lab in microwaves						4
Lab in nanoelectronics		I				4
Lab in signal and image processing					L	4
Lab on app development for tablets and smartphones			J			4
Lab on cell-free synthetic biology						4
Large-scale data science for real-world data				K		6

Students may choose a 30 ECTS specialization in:

- H Microelectronics
- I Nano and optoelectronics
- J Edge computing and IoT
- K AI and machine learning
- L Information technologies and signal processing

Or / and a 30 ECTS minor included in the 120 ECTS.

Recommended minors with this Master:

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

Industrial internship

The program includes a compulsory industrial internship with a minimal duration of 8 weeks (30 ECTS if extended to 4-6 months).

School of Engineering

go.epfl.ch/master-electrical-electronic-engin

contact: philippe.gay-balmaz@epfl.ch

	Specialization					Credits
Options	H	I	J	K	L	
Adaptation and learning				K		4
Advanced analog integrated circuit design	H					3
Advanced computer architecture			J			8
Advanced lab in electrical energy systems						4
Advanced multiprocessor architecture						8
Advanced networks						8
Analog circuits for biochip	H					3
Antennas						4
Applied biomedical signal processing			J		L	4
Applied data analysis				K		8
Applied electromagnetics for metamaterial design						3
Audio					L	4
Automatic speech processing					L	4
Basics in bioinstrumentation						4
Bio-nano-chip design	H					4
Bioelectronics and biomedical microelectronics	H					3
Causal inference				K		4
Classical and quantum photonic transducers		I				3
Computational neurosciences: neuronal dynamics						5
Computational optical imaging						4
Concurrent engineering of space missions						2
Data visualization						6
Deep learning				K	L	4
Deep learning for autonomous vehicles						6
Deep learning for optical imaging						3
Design technologies for integrated systems	H					6
Distributed information systems						6
Distributed intelligent systems						5
Electromagnetic compatibility						4
Embedded system design			J			6
Energy conversion and renewable energy						4
Energy storage systems						3
Fundamentals & processes for photovoltaic devices		I				3
Fundamentals of biomedical imaging						4
Fundamentals of biosensors and electronic biochips		I				3
Fundamentals of VLSI design	H		J			6
Hydropower plants: generating and pumping units						2
Image analysis and pattern recognition					L	4
Image and video coding					L	4
Industrial automation						3
Industrial electronics I, II						8
Information theory and coding						8
Introduction to bioengineering						3
Introduction to quantum science and technology		I				5
Introduction to the design of space mechanisms						2
Lessons learned from the space exploration						2
Machine learning						8
Machine learning I			J			4
Mathematics of data: from theory to computation				K		6
Media security						6
Microwaves, the basics of wireless communications	H					4
Mobile networks						8
Model predictive control					L	4
Multivariable control						4
Nanoelectronics	H	I				2
Nanophotonics		I				3
Network machine learning				K		4
Networked control systems						3
Neural interfaces						6
Optical detectors						3
Optimal decision making						4
Optimisation discrète						5
Photonic systems and technology		I				4
Physical models for micro and nanosystems		I				2
Physics of photonic semiconductor devices		I				4
Power system restructuring and deregulation						3
Project in electrical engineering	H	I	J	K	L	10
Radio frequency circuits design techniques	H					4
Reinforcement learning				K		6
Research project in electrical engineering	H	I	J	K	L	22
Selected topics in advanced optics						3
Semiconductor devices II		I				4
Semiconductor physics and light-matter interaction						4
Seminar in physiology and instrumentation						2
Sensors in medical instrumentation	H					3
Smart sensors for IoT			J			3
Space mission design and operations						2
Space propulsion						3
Spacecraft design and system engineering						5
System programming for Systems-on-chip			J			6
Systems and architectures for signal processing					L	3
Test of VLSI systems	H					2
Transdisciplinary project						4

Options - sustainability (1 course to be chosen):	
Energy supply, economics and transition	2
Energy systems engineering	3
Life cycle assessment in energy systems	3
Lifecycle performance of product systems	3
Space sustainability, a multidisciplinary approach	2
Sustainability and materials	3
Sustainability assessment of urban systems	3