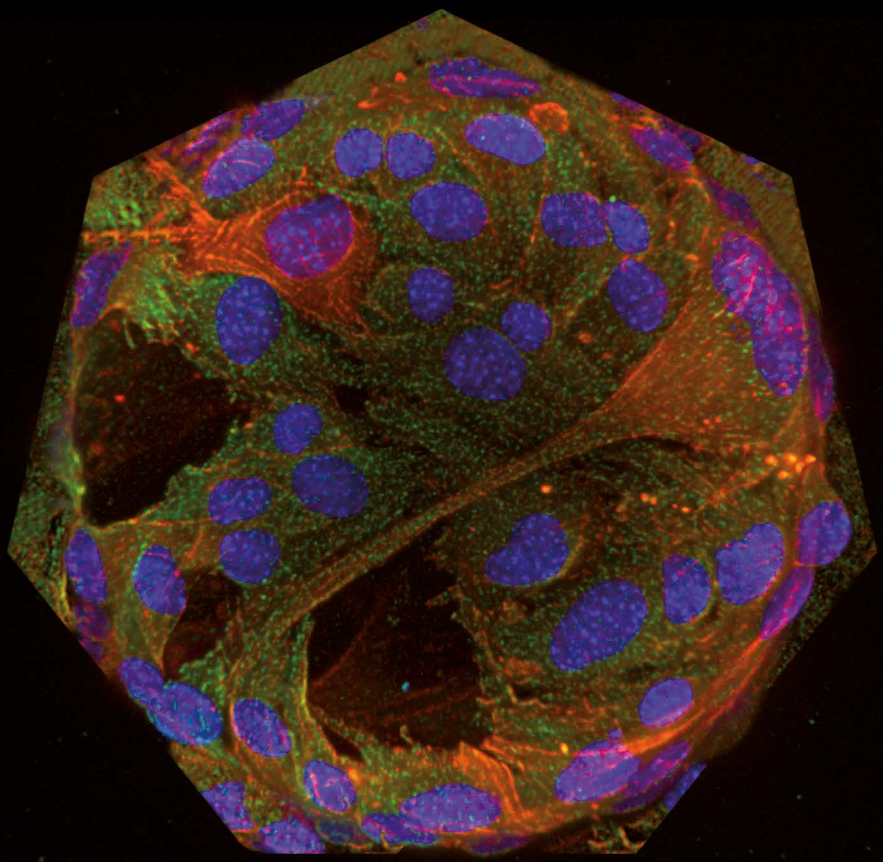
BIOENGINEERING

MASTER

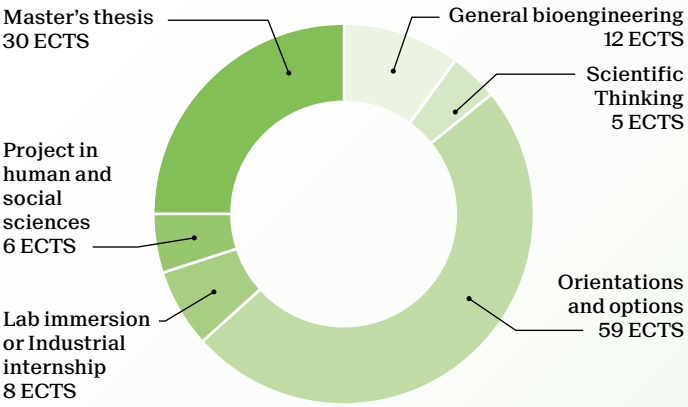


ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Master of Science in

BIOENGINEERING

2-year program - 120 ECTS



Students must choose at least 12 ECTS in one of the orientations A to E and at least 3 credits in domain F.

Students can also opt for a 30 ECTS Minor.
Minors recommended with this Master:

- Biocomputing
- Biomedical Technologies
- Biotechnology
- Management, Technology, Entrepreneurship
- Neuroprosthetics

This program includes an 8-week compulsory internship in industry.

	Orientation						Credits
General bioengineering							12
Analysis and Modelling of Locomotion							3
Biomicroscopy I							3
Fundamentals of Neuroengineering							4
Materials Science							3
Principles and Applications of Systems Biology							3
Stem Cell Biology and Technology							3
Scientific thinking							5
Scientific literature analysis in bioengineering							5
Scientific literature analysis in cell and developmental biology							5
Scientific literature analysis in computational molecular biology							5
Scientific literature analysis in molecular and cancer biology							5
Scientific literature analysis in Neuroscience							5
Scientific project design in Drug Discovery							5
Scientific project design in Integrative Neurosciences							5
Scientific project design in regenerative medicine and diagnostics							5
Scientific project design in Synthetic Biology (iGEM)							5
Scientific project design in Translational Neurosciences							5
Scientific project design in Translational Oncology							5

	Orientation						Credits
Orientations and options							64
Regenerative Medicine	A						
Biomechanical Engineering		B					
Systems Bioengineering			C				
Nanoscale bioengineering				D			
Biophotonics and bioimaging					E		
Law, Organization and Economics in LST						F	
Advanced Analysis I, II							8
Advanced Bioengineering Methods Laboratory				D			4
Biomaterials	A	B					3
Biomechanics of the Cardiovascular System		B					3
Biomechanics of the Musculoskeletal System		B					5
Biomedical Optics							3
BioMEMS	A						2
Biomicroscopy II	A				E		4
Biomolecular Structure and Mechanics			C	D			4
Biophysics I, II							6
Brain Computer interaction							3
Chemical Biology - Tools and Methods				D			3
Computational Motor Control		B					4
Data Analysis and Model Classification							4
Diffraction Methods in Structural Biology				D			4
Dynamical System Theory for engineers			C		E		4
Economics of innovation in the biomedical industry						F	3
Flexible bioelectronics							3
Fundamentals of Biomedical Imaging					E		4
Fundamentals of Biophotonics					E		3
Fundamentals of biosensors and electronic biochips				D			3
Genomics and Bioinformatics	A		C				4
Image Processing I, II					E		6
Introduction au droit et à l'éthique en STV						F	3
Introduction à l'informatique visuelle							4
Lab Immersion II							8
Lab Immersion III							8
Lab immersion academic (outside EPFL) A and B							22
Lab immersion in industry A and B							22
Lab methods: Animal Experimentation							2
Lab methods: Bioactive compounds screening							2
Lab methods: Biosafety						F	3
Lab methods: Flow Cytometry							2
Lab methods: Histology							2
Lab methods: Proteomics							2
Mécanique des structures							4
Multidisciplinary organization of medtechs/biotechs						F	3
Nanobiotechnology and biophysics							3
Numerical methods in biomechanics		B					3
Pharmacology and Pharmacokinetics							5
Semester project in Bioengineering							12
Sensors in medical instrumentation	A	B					3
Sensorimotor Neuroprosthetics		B					4
Signal Processing for Functional Brain Imaging					E		3
Single cell genomics							4
Statistical Physics of Biomacromolecules			C	D			4
Stochastic models in communication			C				6
Tissue Engineering	A						4
Understanding statistics and experimental design							4
Other accredited courses							max. 10

Lab immersion or Industrial internship								8
Lab Immersion I								8
Industrial internship in bioengineering								8

School of Life Sciences
master.epfl.ch/lifesciences
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