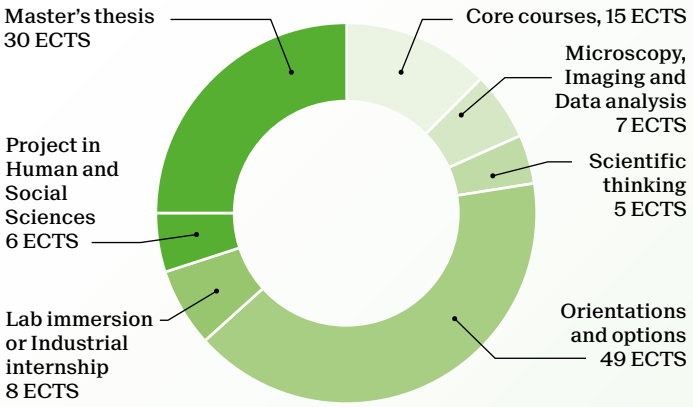
ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

Master of Science in

LIFE SCIENCES AND TECHNOLOGY

2-year program - 120 ECTS



Validation of Orientation requires at least 25 ECTS with the same label (A or B) from the "Core courses" and the "Orientations and options"
Students must choose at least 3 ECTS in domain C.
A: Molecular Medicine and Systems Biology
B: Neurosciences and Neuroengineering
C: Law or Economics

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

- Biocomputing
- Computational Neurosciences
- Management, Technology, Entrepreneurship
- Neuroprosthetics

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

Target student profile

Students with a background in physics, engineering or mathematics who are interested in modern questions of the life sciences are particularly encouraged to apply.

Career prospects

The palette of skills that EPFL Life Sciences and Technology students acquire will prepare them to tackle biological problems quantitatively, to put together models of biological systems to help illuminate problems, and to come up with strategies for research and innovation.
Their combined expertise in biology and engineering will make them ideal partners for research and development in multidisciplinary groups in the academic world or in the pharmaceutical or biomedical industries such as Nestlé, Roche, Novartis, or Debiopharm.
International agreements for study exchange with universities in Europe, the US and Asia create a dynamic atmosphere and offer opportunities for future collaboration or employment.
EPFL has an important institutional commitment to technology transfer, and spin-offs from life science technology research located on campus (PSE) such as AC Immune SA, Mindmaze SA, or Biocartis SA offer internships, master projects and job opportunities for LST students.

School of Life Sciences
master.epfl.ch/lifesciences
contact: master-stv@epfl.ch

	Orientation			Credits
Core courses				**15**
Cancer Biology I	A			5
Cancer Biology II	A			5
Immunology	A			5
Infection Biology	A			5
Neuroscience I: Molecular Neuroscience and Neurodegeneration		B		5
Neuroscience II - Cellular mechanisms of brain function		B		5
Neuroscience III: Behavioral and Cognitive Neuroscience		B		5
Microscopy, Imaging and Data analysis				**7**
Biomicroscopy I				3
Data Analysis and Model Classification				4
Fundamentals of Biomedical Imaging				4
Image Processing I				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
Orientations and options				**49**
Molecular Medicine and System Biology	A			
Neurosciences and Neuroengineering		B		
Law, Organization and Economics in LST			C	
Advanced Analysis I , II				8
Advanced principles and Application of Systems Biology	A			3
Biological Modeling of Neural Networks		B		4
BioMEMS				2
Biomicroscopy II				4
Biomolecular Structure and Mechanics	A			4
Brain Computer interaction		B		3
Chemical Biology - Tools and Methods				3
Computational Motor Control		B		4
Diffraction Methods in Structural Biology				4
Dynamical System Theory for engineers	A	B		4
Economics of innovation in the biomedical industry			C	3
Fundamentals of biosensors and electronic biochips				3
Fundamentals of Neuroengineering		B		4
Genomics and Bioinformatics	A			4
Image Processing II				3
In Silico Neuroscience		B		4
Introduction au droit et à l'éthique en STV			C	3
Introduction à l'informatique visuelle		B		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	A			2
Lab methods: Bioactive compounds screening	A			2
Lab methods: Biosafety			C	3
Lab methods: Flow Cytometry	A			2
Lab methods: Histology	A			2
Lab methods: Proteomics				2
Modèles stochastiques pour les communications				6
Molecular Endocrinology	A			3
Multidisciplinary organization of medtechs/biotechs			C	3
Nanobiotechnology and biophysics				3
New tools and research strategies in personalized medicine	A			4
Nutrition: from molecules to health	A			4
Pattern Classification and Machine Learning				7
Pharmacology and Pharmacokinetics	A	B		5
Principles and Applications of Systems Biology	A			3
Semester project in Life Sciences & Technology				12
Sensorimotor Neuroprosthetics		B		4
Sensors in medical instrumentation				3
Signal Processing for Functional Brain Imaging		B		3
Single cell genomics				4
Statistical Physics of Biomacromolecules				4
Stem Cell Biology and Technology	A			3
Understanding statistics and experimental design				4
Unsupervised and Reinforcement Learning in Neural Networks		B		4
Other accredited courses				max. 10
Lab immersion or Industrial internship				**8**
Lab Immersion I				8
Industrial internship in life sciences				8