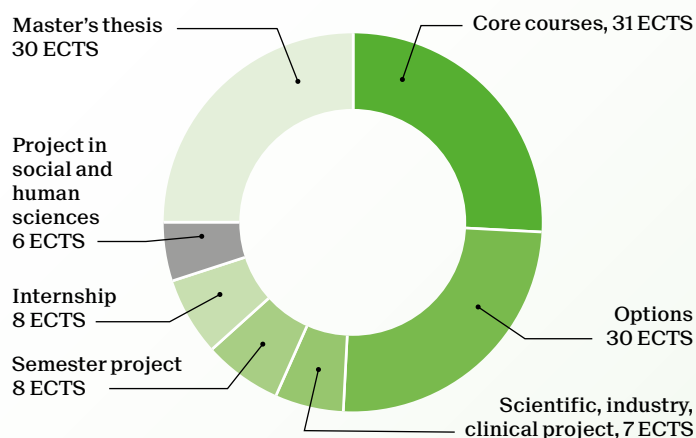


Master of Science in NEURO-X

2-year program - 120 ECTS



Students may choose a minor (30 ECTS), e.g.:

- Biomedical technologies
- Imaging
- Photonics

Career prospects

Thanks to their interdisciplinary profile and their translational spirit, graduates will have the opportunity to become future leaders, start-up managers, or innovative health professionals in the industry (MedTech, pharmaceutical companies or health care), in hospitals and in research in general. Their ability to see the big picture in terms of systems combined with a realistic perspective of what it means to develop and manufacture a product, as well as their ability to interact with many other types of experts in this field makes them highly esteemed professionals.

Schools of Life Sciences, Engineering,
Computer and Communication Sciences
go.epfl.ch/master-neuro-x
contact: snx@epfl.ch

	Credits
Core courses	31
Brain-like computation and intelligence	5
Computational neuroscience: neuronal dynamics	5
Machine learning	8
Neural interfaces	6
Neural signals and signal processing	6
Neuroscience: behavior and cognition	5
Neuroscience: cellular and circuit mechanisms	5
Neuroscience: from molecular mechanisms to disease	5
Translational neuroengineering	6

Options	30
Area: Technology	
Analog IC design	3
Basics of robotics for manipulation	3
Bioelectronics and biomedical microelectronics	3
Bio-nano-chip design	4
Computational motor control	4
Controlling behavior in animals and robots	5
Design technologies for integrated systems	6
Fundamentals of biosensors and electronic biochips	3
Haptic human robot interfaces	4
Nanotechnology	3
Organic and printed electronics	2
Sensors in medical instrumentation	3
Sustainability and materials	3
Virtual reality	6
Area: Data Science and Machine Learning	
Applied biostatistics	5
Applied data analysis	8
Applied probability and stochastic processes	4
Causal thinking	5
Deep learning	4
Deep learning in biomedicine	6
Deep reinforcement learning	6
Dynamical system theory for engineers	6
Introduction to natural language processing	6
Learning in neural networks	6
Machine learning I	4
Machine learning for behavioral data	6
Mathematics of data: from theory to computation	6
Optimization for machine learning	8
Understanding statistics and experimental design	4
Visual intelligence: machines and minds	6
Area: Imaging and image analysis	
Advanced computer graphics	6
Biomedical optics	3
Biomicroscopy I	4
Biomicroscopy II	4
Computer vision	6
Fundamentals of biomedical imaging	4
Fundamentals of biophotonics	3
Image analysis and pattern recognition	4
Image Processing I	3
Image Processing II	3
MRI Practicals on CIBM preclinical imaging systems	3
Area: Neuro-exploration	
Advanced methods for human neuromodulation	4
Computational neurosciences: biophysics	5
Ethics and law of AI	4
Neural circuits of motivated behaviors	4
Scientific literature analysis in neuroscience	4
Scientific project design in integrative neurosciences	4
Systems neuroscience	4
Area: Medtech industry skills	
Design in innovation: creation for adoption	4
Regulatory, quality and clinical affairs	2