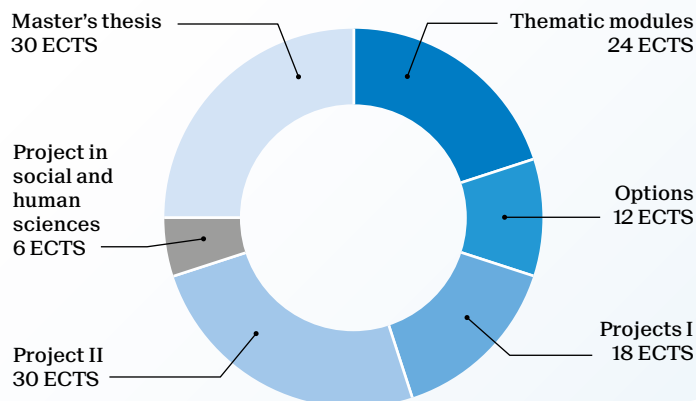


# Master of Science in MOLECULAR AND BIOLOGICAL CHEMISTRY

2-year program - 120 ECTS



## Thematic modules and catalysis/sustainability specialization

Students must choose 3 thematic modules. They may opt for a 30 ECTS catalysis/sustainability specialization. In this case, the sustainability module is mandatory and 16 ECTS of the specialization labeled courses must be taken on top of the project in molecular sciences Ia.

	Spec.	Credits
<b>Options</b>		
<b>Catalysis</b>		
Advanced nuclear magnetic resonance	●	3
Bioprocesses and downstream processing	●	4
Biotechnology lab (for CGC)	●	4
Catalysis for emission control and energy processes	●	3
Heterogeneous reaction engineering	●	4
<b>Sustainability</b>		
Environmental economics	●	4
Environmental system analysis and assessment	●	5
Fate and behaviour of environmental contaminants	●	4
Introduction to ethics and critical thinking	●	3
Process intensification and green chemistry	●	3
Safety of chemical processes	●	2
Science of climate change	●	4
Sustainability and materials	●	3

Students may also opt for a 30 ECTS minor instead of the project in molecular sciences II.

Recommended minors:

- Life sciences engineering
- Physics
- Physics of living systems

	Spec.	Credits
<b>Thematic modules</b>		
<b>Analytical and bioanalytical chemistry</b>		
Methods in drug development		3
Physical and chemical analyses of materials	●	3
Protein mass spectrometry and proteomics		2
<b>Biological chemistry and biophysics</b>		
Nanobiotechnology		3
Pharmaceutical biotechnology		3
Photomedicine		2
<b>Computational chemistry</b>		
Computational methods in molecular quantum mechanics		4
Understanding advanced molecular simulation		4
<b>Inorganic chemistry</b>		
Catalysis for energy storage	●	3
Catalyst design for synthesis	●	2
Solid state chemistry and energy applications		3
<b>Organic chemistry</b>		
Physical and computational organic chemistry		2
Structure and reactivity		3
Total synthesis of natural products		3
<b>Physical chemistry</b>		
Nanofluidics		3
Optical methods in chemistry	●	3
Photochemistry I		2
<b>Sustainability</b>		
Automated and data-driven laboratories	●	2
Sustainable chemicals manufacture: concepts/tools	●	4
Sustainable chemistry and engineering in industry	●	2
<b>Options</b>		
<b>Molecular and supramolecular science</b>		
Asymmetric catalysis for fine chemicals synthesis	●	3
Chemistry of elements		2
Energy conversion by semiconductor devices	●	2
Supramolecular chemistry		2
<b>Physical and analytical chemistry</b>		
AI for chemistry	●	3
Fundamentals of biosensors and electronic biochips		3
Machine learning for physicists	●	6
Molecular quantum dynamics		3
<b>Material science</b>		
Nanomaterials		3
Organic electronic materials		4
Physical chemistry of polymeric materials		4
Polymer chemistry and macromolecular engineering		3
<b>Food science</b>		
Chemistry of food processes		2
Chimie des denrées alimentaires		2
Risk management	●	2
<b>Projects I</b>		
Project in molecular sciences Ia	●	6
Project in molecular sciences Ib		12

School of Basic Sciences  
[go.epfl.ch/master-chemistry](https://go.epfl.ch/master-chemistry)  
 Contact: [scgc@epfl.ch](mailto:scgc@epfl.ch)