Master of Science in
CHEMICAL ENGINEERING
AND BIOTECHNOLOGY

2-year program - 120 ECTS

Core courses 10 ECTS
- Chemical engineering
- Diffusion and mass transfer
- Heterogeneous reaction engineering
- Management and safety
- Safety of chemical processes

Options 28 ECTS
- Theme A: Energy
  - Catalysis for emission control and energy processes
  - Catalysis for energy storage
  - Electrochemical engineering
  - Modeling and optimization of energy systems
  - Nanomaterials for chemical engineering application
  - Process intensification and green chemistry
  - Solid state chemistry and energy applications
  - Thermodynamics of energy conversion and storage

- Theme B: Biotechnology
  - Bioprocesses and downstream processing
  - Biotechnology lab (for CGC)
  - Food biotechnology
  - Nanobiotechnology
  - Pharmaceutical biotechnology
  - Principles and applications of systems biology
  - Selected topics in life sciences
  - Synthetic biology

- Theme C: Materials and food engineering
  - Chemistry of food processes
  - Chimie des denrées alimentaires
  - Entrepreneurship in food & nutrition science
  - Food biotechnology
  - Organic electronic materials
  - Physical and chemical analyses of materials
  - Physical chemistry of polymeric materials
  - Polymer chemistry and macromolecular engineering
  - Risk management
  - Solid state chemistry and energy applications
  - Sustainability and materials

Industrial internship 30 ECTS

Laboratory and projects 16 ECTS
- Chemical engineering lab and project
- Chemical engineering product design
- Process development

Project in social and human sciences 6 ECTS
- Entrepreneurship in food & nutrition science
- Environmental Economics
- Environmental system analysis and assessment
- Fate and behaviour of environmental contaminants
- Introduction to ethics and critical thinking
- Legal aspect of sustainability & digitalization
- Science of climate change

Master’s thesis 30 ECTS

Students may opt for a 30 ECTS catalysis/sustainability specialization. In this case, 18 ECTS of specialization labeled courses must be taken on top of the core courses and the chemical engineering lab and project.

Students may also opt for a 30 ECTS minor instead of the industrial internship.

Recommended minors:
- Engineering for sustainability
- Materials science and engineering
- Physics

School of Basic Sciences
go.epfl.ch/master-chemical-engineering

Contact: scgc@epfl.ch