Welcome to EPFL
ENAC Faculty
Welcome to EPFL ENAC Faculty

Civil Engineering

Architecture

Environmental Sciences and Engineering
Presentation of the SIE Master program

- Professional perspectives
- Admission
- Practical information
- Structure of the program
- Master Specializations
- Interdisciplinary Minors
- How to design your Master studies
- Project-based learning
- Highlights
Professional perspectives

Yearly Alumni Survey SIE 2022

- Engineering offices: 40%
- Companies and industry: 17%
- Research and teaching: 11%
- Administration: 19%
- Unemployed: 1%
- NGO: 2%
- Associations: 2%
- Start-up: 4%
- Independants: 2%
- Other: 4%
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Hold a Bachelor's degree in Environmental Sciences and Engineering (Automatic admission for EPFL SIE students)

Have <10 ECTS credits missing in the 3rd year of the SIE Bachelor's program for conditional admission to the Master's program

External applications according to the EPFL procedure
  • Deadlines: 15th Dec; 15th April

https://www.epfl.ch/education/admission/admission-2/master-admission-criteria-application/
**Practical information**

- **A lot of flexibility**: You are responsible to develop a coherent and balanced plan.

- **Teaching Language**: Mainly English, few courses in French. It is possible to complete this program in English entirely.

- **Diploma and title obtained**: EPFL qualified Engineer. Title recognized in all of Europe. Master Diploma recognized in the whole world.
Structure of the Program

3 semesters

Core courses: 15 ECTS
- Sensing and spatial modeling for earth observation, 5 ECTS
- Water and waste water treatment, 5 ECTS
- Water resources engineering, 5 ECTS
- Atmospheric processes: from clouds to global scales, 5 ECTS
- Impact of Climate Change on Energy Production (TBC), 5 ECTS (2024-2025)

Options: 49 ECTS
- Specializations
- Minors

Projects in environmental sciences: 20 ECTS
- Design Project, 10 ECTS
- Individual SIE project, 10 ECTS

Project in social and human sciences: 6 ECTS
- Project SHS

+ Internship/Stage (2 to 6 months)

1 semester

Master thesis (PDM): 30 ECTS
Master specializations

Water resources and management

Environmental sensing and computation

Climate change anticipation and adaptation

Biological and chemical processes in env. engineering

Water and resources management

Focus
- Hydrology, hydraulics, limnology, snow
- Water quality and regime
- Risk, renaturation, economical aspects

Head of the lakes and rivers section
Environment Service, Fribourg Canton

Project Engineer
Flussbau (River and hydraulic engineering)
Climate change anticipation and adaptation

Focus

- Atmospheric processes, air quality, hydrology
- Renewable energy, environmental impacts
- Risk, environmental management

Sustainability consultant
Quantis

Scientific deputy
Cantonal Energy Office, Genève Canton
Environmental sensing and computation

Focus

- Databases, sensors, image processing
- Earth observation, GIS
- Environmental modeling, geostatistics

Scientific collaborator
MicroGIS (spatial analysis and mapping)

Director
Helimap Sixens Mapping (Light detection and ranging mapping)
Biological and chemical processes in env. engineering

Focus

- Water and waste treatment, material recycling
- Soil remediation, material and energy flows
- Industrial risks, env. health, ecotoxicology

**PhD student**
Eawag, Swiss Federal Institute of Aquatic Science and Technology

**Project officer**
EREP SA, (Treatment and valorization of waste and organic effluents)
Recommended Minors by SIE

- Territories in transformation and climate
- Energy
- Data Science
- Engineering for Sustainability
- Integrated design, architecture and sustainability
- Management, technology and entrepreneurship

Minor Engineering for Sustainability

- Contribute to **sustainability in your future profession** and add a sustainability focus to your diploma

- Develop new competences to tackle **complex sustainability challenges**: take attractive courses from outside your section; discover new disciplines, tools and approaches

- Carry out an **interdisciplinary research project** in your field of interest (10 credits)

- **Coordinator:** Charlotte Vandenberghe

How to design your Master studies

- More flexibility toward a smart combination
- 2 specializations
  - Ex.: Water resources + Sensing/computation
- 1 specialization + 1 minor
  - Ex.: Climate change + Energy
- Goal
  - To acquire complementary skills
  - To better meet the professional needs
  - To improve interdisciplinarity approach
Benefit from a large project-based learning

- **Design Project** (10 ECTS)
  - Proposals from external partners
  - Challenging topics with industry, eng. companies, public administration

- **Individual research project** (10 ECTS)
  - Proposals from research labs
  - Integration in research teams
  - 28 labs in environmental sciences and engineering & ENAC labs

- **Master Thesis** (PDM; 30 ECTS)
  - In a research lab
  - With an external partner
  - In Switzerland or abroad
Research foci of our 28 research labs

- Ecology and Biogeochemical Cycles
- Water and Waste Engineering
- Human-Environment Interactions
- Sustainable Energy Systems
- Environmental Modeling and Monitoring
- Atmosphere and Climate
- ALPOLE – Alpine and Polar Research
Highlights

- Flexible Program: possibility to do a specialization + minor
- Design project and Individual SIE project
- Internship to get a sense of professional life
- Several possibilities for the Master thesis: in a lab, with an external partner or within a company
- Several possibilities to go abroad: for a semester of courses, the internship and/or Master thesis
Important links

- **SIE Webpages**

- **SIE Moodle**
  - Free access for EPFL users

- **SIE Specializations**

- **Interdisciplinary minors EPFL**
  - [https://www.epfl.ch/education/master/study-programs-structure/interdisciplinary-minors/](https://www.epfl.ch/education/master/study-programs-structure/interdisciplinary-minors/)

- **Interdisciplinary minors coordinated by ENAC**
  - [https://www.epfl.ch/schools/enac/education/interdisciplinary-teaching/interdisciplinary-minors/](https://www.epfl.ch/schools/enac/education/interdisciplinary-teaching/interdisciplinary-minors/)
Thank you

Contact: pierre-yves.gillieron@epfl.ch
SIE Master Program 2023-24

4 Specializations
# Water Resources and Management

<table>
<thead>
<tr>
<th>Specialisation D: Water Resources and Management</th>
<th>Resp.: Tom Battin</th>
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<tbody>
<tr>
<td>ENV-509 Applied wastewater engineering</td>
<td>(pas donné en 2024-25) Mattile</td>
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<tr>
<td>ENV-420 Bio-ingénierie des cours d'eau et milieux naturels</td>
<td>Adam</td>
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<tr>
<td>ENV-526 Climate and Water Sensitive Urban Design</td>
<td>Manoli</td>
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<tr>
<td>ENV-418 Éco-morphologie fluviale</td>
<td>De Cesare / Juez</td>
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<td>CIVIL-441 Economie hydraulique</td>
<td>Davalle/Droz</td>
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<td>ENV-507 Fate and behaviour of environmental contaminants</td>
<td>Kohn</td>
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<tr>
<td>ENV-512 Global change ecology and fluvial ecosystems</td>
<td>Battin/Robison</td>
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<tr>
<td>ENV-504 Groundwater and soil remediation</td>
<td>(pas donné en 2023-24) Bernier-Latmani</td>
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<td>André/Arborino/De Cesare</td>
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<td>ENV-523 Hydrogeophysics</td>
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<td>ENV-417 Hydrologie urbaine</td>
<td>Rossi L.</td>
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<td>ENV-540 Image processing for earth observation</td>
<td>Tuia</td>
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<td>ENV-425 Limnology</td>
<td>Tofield-Pasche</td>
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<td>ENV-525 Physics and hydrology of snow</td>
<td>Huwald/Lehning/Gaume</td>
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<tr>
<td>ENV-524 Risques hydrologiques et aménagements</td>
<td>Ancey</td>
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<tr>
<td>ENV-402 Sanitary engineering in developing countries</td>
<td>Luthi</td>
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<td>ENG-424 Water resources engineering</td>
<td>Rinaldo/Trevisin</td>
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<tr>
<td>ENV-549 Irrigation and drainage engineering</td>
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## Climate Change Anticipation & Adaptation

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<tbody>
<tr>
<td>ENV-409 Air pollution</td>
<td>Takahama/Reimann</td>
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<tr>
<td>ENV-422 Applied Ecology</td>
<td>Grossiord</td>
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<tr>
<td>ENV-407 Atmospheric processes: from cloud to global scales</td>
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<td>ENV-526 Climate and Water Sensitive Urban Design</td>
<td>Manoli</td>
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<td>ENV-418 Eco-morphologie fluviale</td>
<td>De Cesare/Gostner</td>
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<td>ME-409 Energy conversion and renewable energy</td>
<td>Maréchal/Nguyen T.-V.</td>
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<td>ENG-474 Etudes d'impact</td>
<td>Schmidt/Devanthéry/Helfer</td>
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<td>ENV-444 Exploratory data analysis in environmental health</td>
<td>(pas donné en 2023-24) Joost/Guessous</td>
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<td>ENV-524 Risques hydrologiques et aménagements</td>
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<tr>
<td>ENV-410 Science of climate change</td>
<td>Schmale</td>
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<td>ENV-461 Sustainability assessment of urban systems</td>
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<td>ENV-469 Systèmes de management environnementaux</td>
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<td>ENV-462 Urban Green &amp; Blue infrastructure and global warming</td>
<td>Kazemi</td>
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## Spécialisation F: Environmental Sensing and Computation

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<td>ENV-542</td>
<td>Advanced satellite positioning</td>
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<td>ENG-466</td>
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<td>ENG-420</td>
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<td>MICRO-511</td>
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<td>CIVIL-460</td>
<td>Indoor air quality and ventilation</td>
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<td>ENV-521</td>
<td>Multivariate statistics in R</td>
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<td>ENV-408</td>
<td>Sensing and spatial modeling for earth observation</td>
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<td>ENV-548</td>
<td>Sensor orientation</td>
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<tr>
<td>ENV-405</td>
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