Environmental Sciences and Engineering

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de Lausanne

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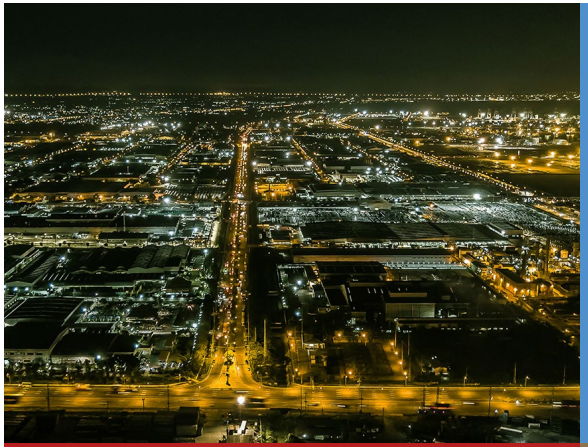
Welcome to EPFL ENAC Faculty

SIE Master program

Welcome to EPFL ENAC Faculty



Civil Engineering

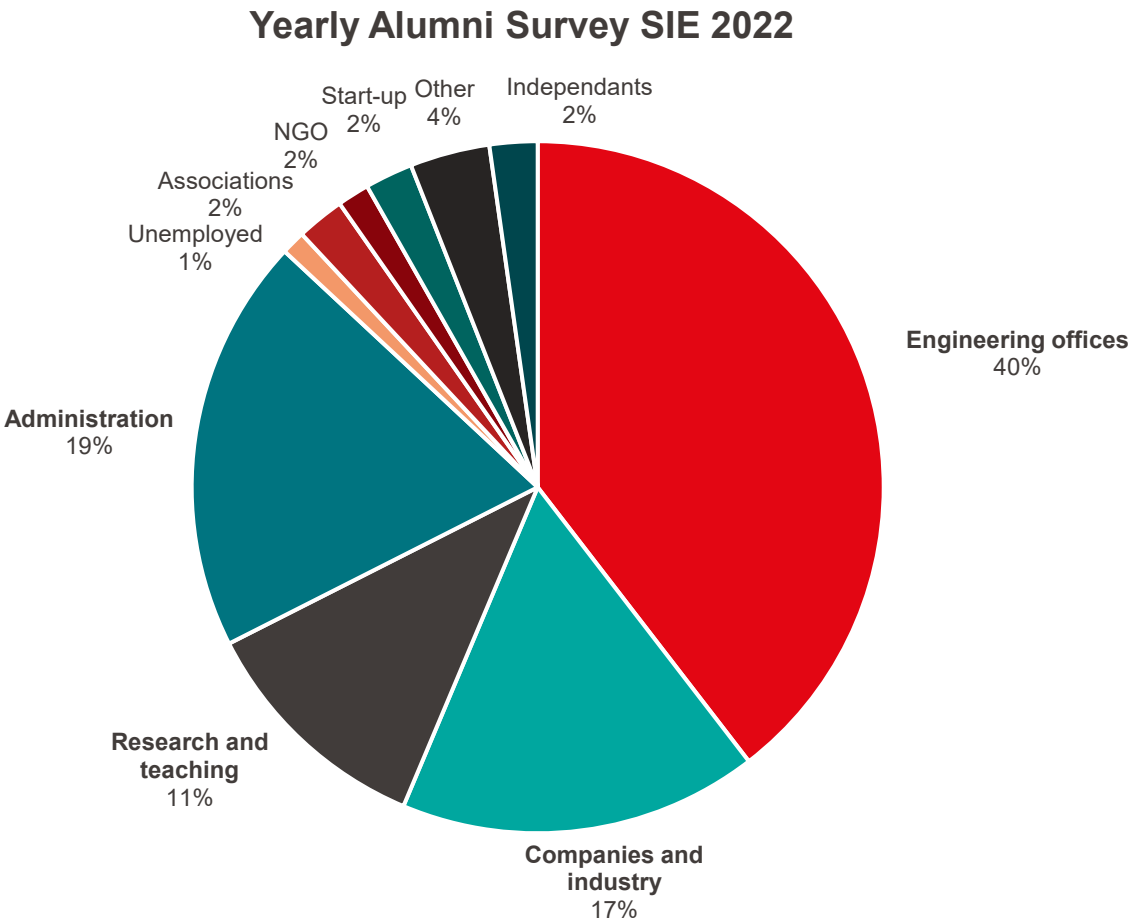
Architecture

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



Average salary (CHF)

- 2006 cohort : 133’000.-
- 2016 cohort: 98’000.-
- 2022 cohort: 76’000.-

Average job search time: 3 months

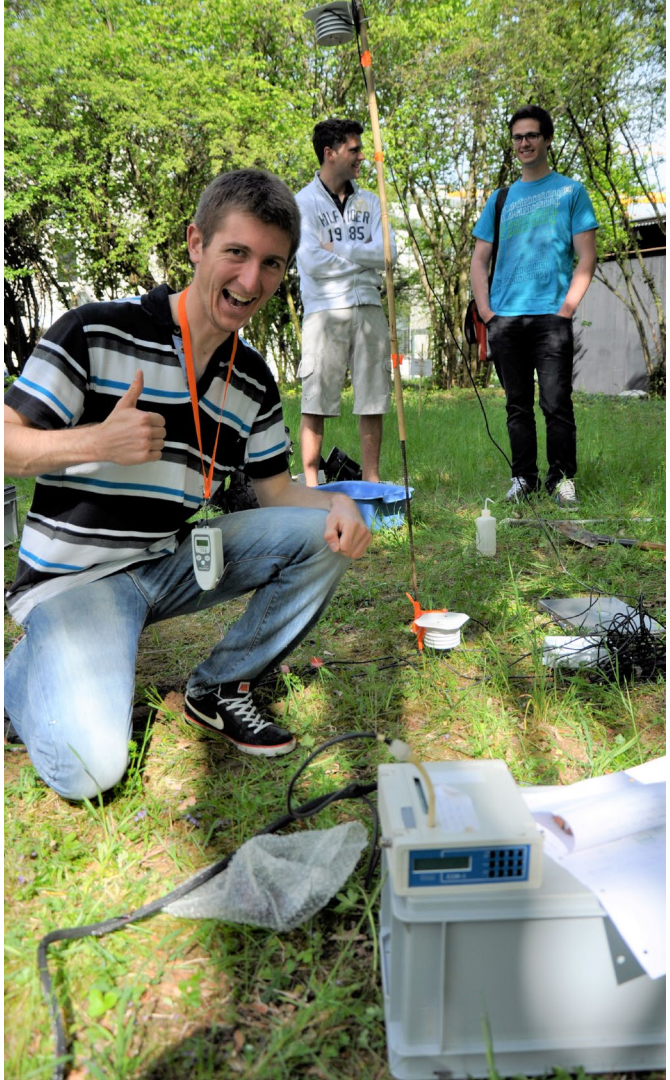
Applications on average: 11

Positions obtained: 1,8

Admission

- 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/

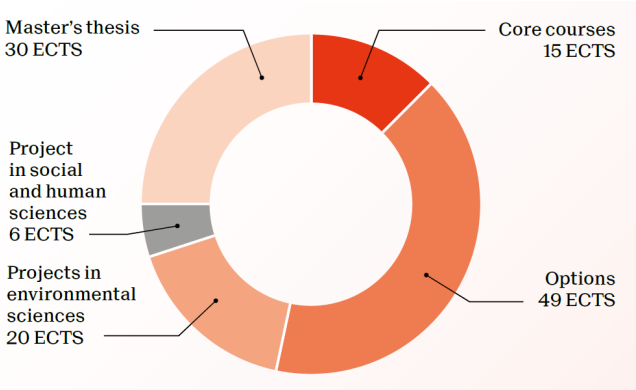


Practical information

- **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.

ENAEE European Network for Accreditation of Engineering Education

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 ressources 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

https://www.epfl.ch/schools/enac/education/environmental-sciences-and-engineering/environmental-sciences-and-engineering/formation-en/master-en/specialisations/

Water resources and management

Environmental sensing and computation

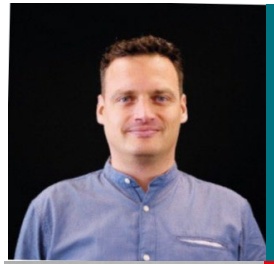
Climate change anticipation and adaptation

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

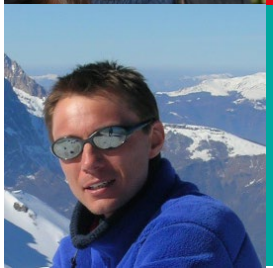
Environmental sensing and computation

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)

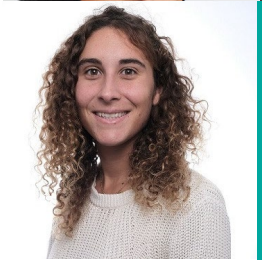
Biological and chemical processes in env. engineering

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

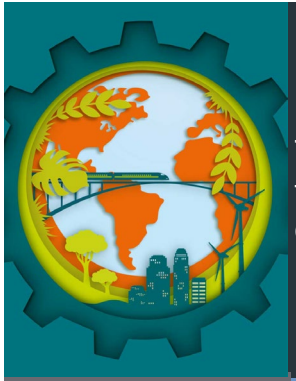


Project officer

EREP SA , (Treatment and valorization of waste and organic effluents)

Recommended Minors by SIE

https://www.epfl.ch/schools/enac/education/environmental-sciences-and-engineering/environmental-sciences-and-engineering/formation-en/minors/

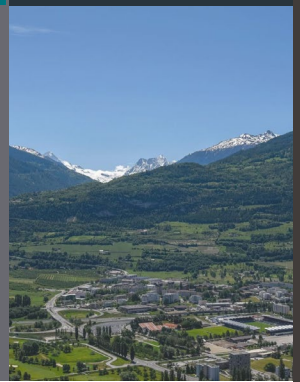


Territories in transformation and climate

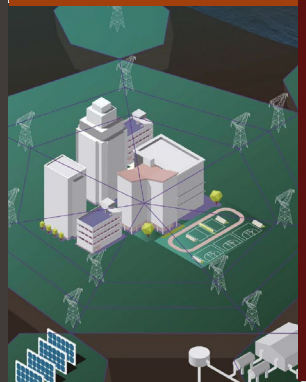
Energy

Data Science

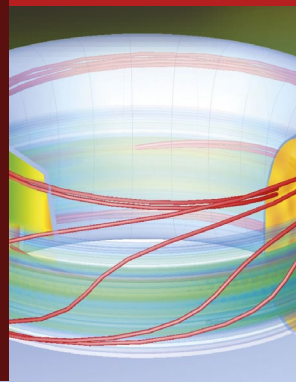
Engineering for Sustainability



Integrated design, architecture and sustainability



Management, technology and entrepreneurship

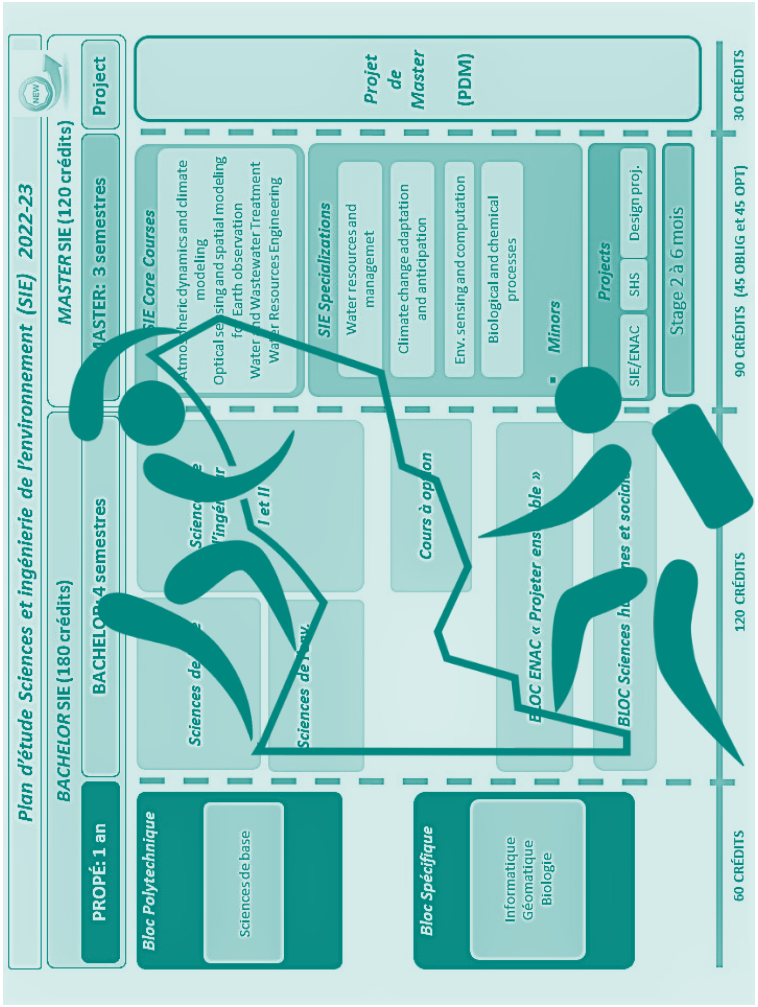


Minor Engineering for Sustainability

- 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
- https://www.epfl.ch/schools/enac/education/interdisciplinary-teaching/interdisciplinary-minors/minor-in-engineering-for-sustainability/

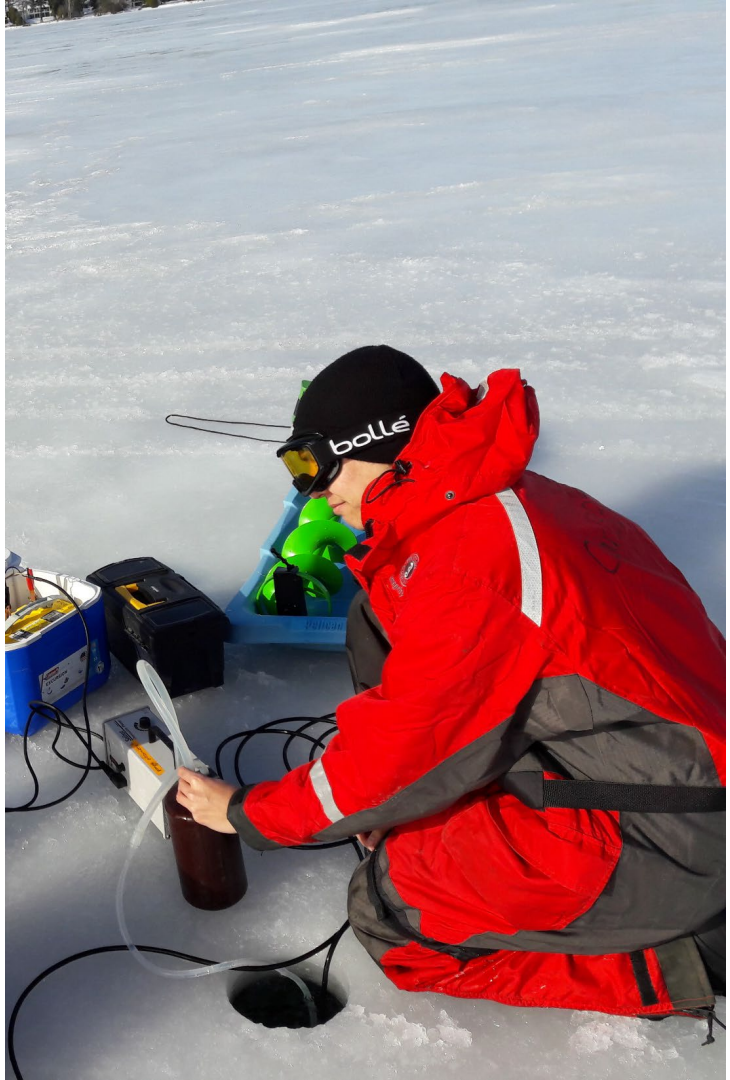
How to design your Master studies

- 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



EPFL

Research foci of our 28 research labs

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**
  - https://www.epfl.ch/schools/enac/education/environmental-sciences-and-engineering/
- **SIE Moodle**
  - https://moodle.epfl.ch/course/view.php?id=18315
  - Free access for EPFL users
- **SIE Specializations**
  - https://www.epfl.ch/schools/enac/education/environmental-sciences-and-engineering/environmental-sciences-and-engineering/formation-en/master-en/specialisations/
- **Interdisciplinary minors EPFL**
  - 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/

Thank you

Contact: pierre-yves.gillieron@epfl.ch

SIE Master Program 2023-24

4 Specializations

Water Resources and Management

Spécialisation D: Water Resources and Management			Resp.: Tom Battin
ENV-509	Applied wastewater engineering	(pas donné en 2024-25)	Mattle
ENV-420	Bio-ingénierie des cours d'eau et milieux naturels		Adam
ENV-526	Climate and Water Sensitive Urban Design		Manoli
ENV-418	Éco-morphologie fluviale		De Cesare /Juez
CIVIL-441	Économie hydraulique		Davalle/Droz
ENV-507	Fate and behaviour of environmental contaminants		Kohn
ENV-512	Global change ecology and fluvial ecosystems		Battin/Robison
ENV-504	Groundwater and soil remediation	(pas donné en 2023-24)	Bernier-Latmani
CIVIL-410	Hydraulique fluviale et aménagement de cours d'eau		André/Arborino/De Cesare
ENV-523	Hydrogeophysics		Holliger K.
ENV-417	Hydrologie urbaine		Rossi L.
ENV-540	Image processing for earth observation		Tuia
ENV-425	Limnology		Tofield-Pasche
ENV-525	Physics and hydrology of snow		Huwald/Lehning/~~Gaume~~
ENV-524	Risques hydrologiques et aménagements		Ancey
ENV-402	Sanitary engineering in developing countries		Lüthi
ENG-424	Water resources engineering		Rinaldo/Trevisin
ENV-549	Irrigation and drainage engineering		Perona

Climate Change Anticipation & Adaptation

Spécialisation E: Climate Change Anticipation and Adaptation			Resp.: Athanasios Nenes
ENV-409	Air pollution		Takahama/Reimann
ENV-422	Applied Ecology		Grossiord
ENV-407	Atmospheric processes: from cloud to global scales		Berne/Nenes/Gehring
ENV-526	Climate and Water Sensitive Urban Design		Manoli
ENV-418	Éco-morphologie fluviale		De Cesare /Gostner
ME-409	Energy conversion and renewable energy		Maréchal/Nguyen T.-V.
ENG-474	Etudes d'impact		Schmidt/Devanthéry/Helfer
ENV-444	Exploratory data analysis in environmental health	(pas donné en 2023-24)	Joost/Guessous
ENV-417	Hydrologie urbaine		Rossi L.
ENV-540	Image processing for earth observation		Tuia
ENV-525	Physics and hydrology of snow		Huwald/Lehning
ENV-524	Risques hydrologiques et aménagements		Ancey
ENV-410	Science of climate change		Schmale
ENV-461	Sustainability assessment of urban systems		Binder/Duygan
ENV-469	Systèmes de management environnementaux		Baracchini
ENV-462	Urban Green&Blue infrastructure and global warming		Kazemi

Environmental Sensing and Computation

Spécialisation F: Environmental Sensing and Computation			Resp.: Devis Tuia
ENV-542	Advanced satellite positioning	(pas donné en 2023-24)	Botteron/Skaloud
ENV-409	Air pollution		Takahama/Reimann
CS-401	Applied data analysis		West
CS-423	Distributed information systems		Aberer
ENG-466	Distributed intelligent systems	(pas donné en 2023-24)	Martinoli
ENG-420	Environmental transport phenomena		Porte-Agel/Crouzy
ENV-444	Exploratory data analysis in environmental health	(pas donné en 2023-24)	Joost/Guessous
MICRO-511	Image processing I		Unser/Van de Ville
MICRO-512	Image processing II		Liebling/Sage/Unser /Van de Ville
ENV-540	Image processing for earth observation		Tuia
CIVIL-460	Indoor air quality and ventilation		Licina
ENV-521	Multivariate statistics in R		Peter H.
ENV-408	Sensing and spatial modeling for earth observation		Skaloud/Berne/Tuia
ENV-548	Sensor orientation		Skaloud

Biological and Chemical Processes in Environmental Engineering

Spécialisation G: Biological and Chemical Processes in Environmental Engineering			Resp.: Rizlan Bernier-Latmani
ENV-509	Applied wastewater engineering	(pas donné en 2023-24)	Mattle
ENV-470	Development engineering		Schönenberger/Makohliso
ENV-306	Ecotoxicology		Schirmer/Ferrari
ENV-507	Fate and behaviour of environmental contaminants		Kohn
ENV-512	Global change ecology and fluvial ecosystems		Battin/Robison
ENV-504	Groundwater and soil remediation	(pas donné en 2023-24)	Bernier-Latmani
ENV-523	Hydrogeophysics		Holliger K.
ENV-417	Hydrologie urbaine		Rossi L.
ENV-425	Limnology		Tofield-Pasche
ENV-501	Material and energy flow analysis		Binder/Moreau/Hecher
MSE-463	Recycling of materials		Leterrier
ENV-402	Sanitary engineering in developing countries		Lüthi
ENV-468	Occupational and environmental health		Vernez
ENV-500	Solid waste engineering		Ludwig
ENV-405	Water and wastewater treatment		Holliger C./von Gunten/Gu