Pierre-Yves Gilliéron,
Section Deputy

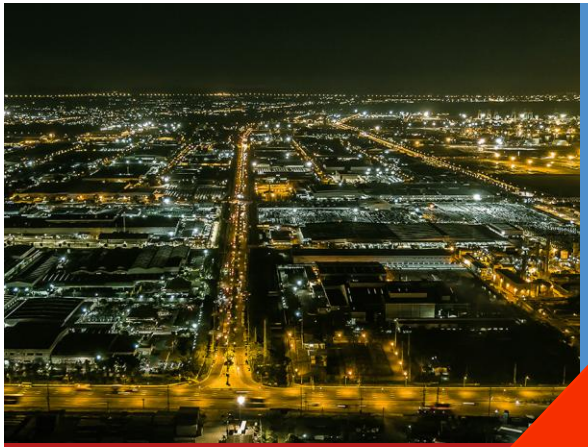
Christina Treier,
Administrative specialist

Charlotte Vandenberghe,
Project officer

Marina Nicollier
Master Urban Systems

Environmental Sciences and Engineering Section

Presentation of Master Programs



SIE Bachelor

NEW

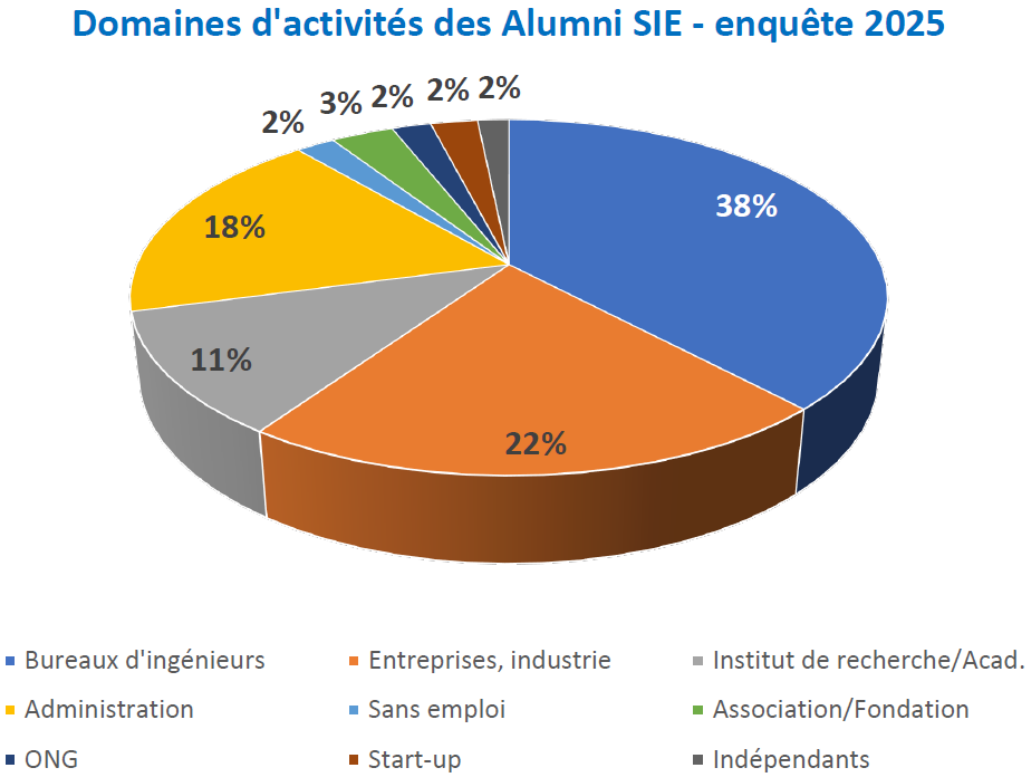
Master in Urban Systems

Master in 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 : 158’000.- [19 y]
- 2016 cohort : 102’000.- [10 y]
- 2024 cohort : 82’000.- [1 y]

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; 31st March

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

Practical information

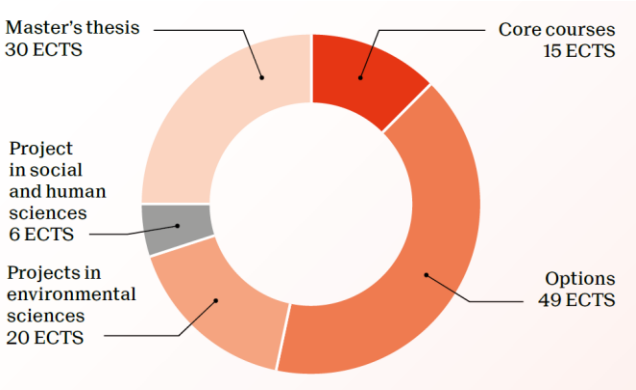
- **A lot of flexibility** : You are responsible to develop a coherent and balanced plan
- **Teaching Language**: Mainly English, few courses in French. It is possible to complete this program in English entirely.
- **Diploma and title obtained:** EPFL qualified Engineer. Title recognized in all of Europe. Master Diploma recognized in the whole world.

Cti
Commission des titres d'ingénieur

ENAEE European Network for Accreditation of Engineering Education

Titre d'ingénieur reconnu officiellement en France

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*
- Sustainability, Climate and Energy, *5 ECTS*

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*
- **SHS Project**

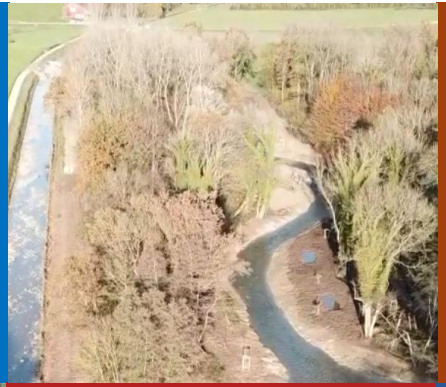
1 semester

Master thesis (PDM): *30 ECTS*

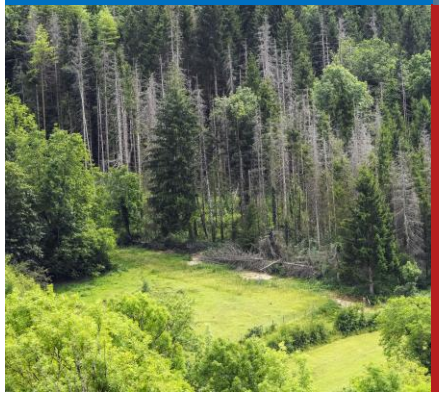
+ Internship/Stage (2 to 6 months)

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

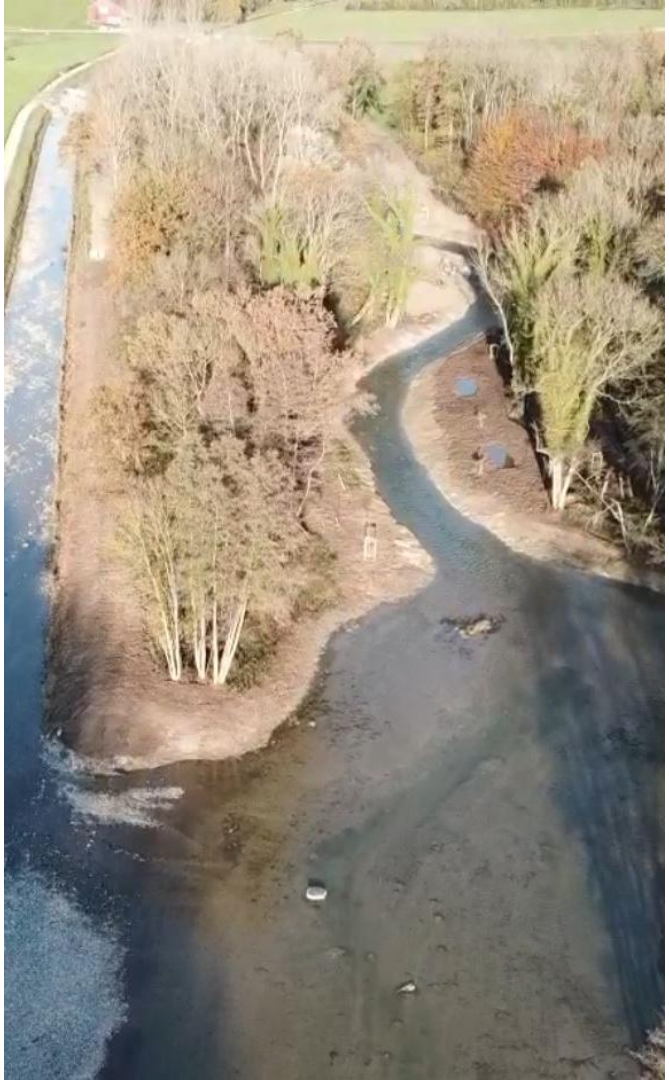
- Hydrology, hydraulics, limnology, snow
- Water quality and regime
- Risk, renaturation, economical aspects

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, climate action plan

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

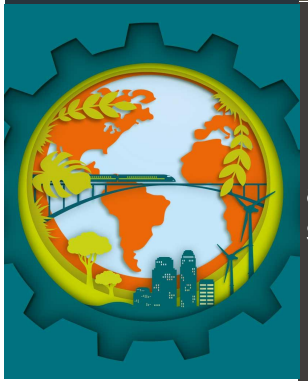
EREP SA , (Treatment and valorization of waste and organic effluents)

Recommended Minors by SIE

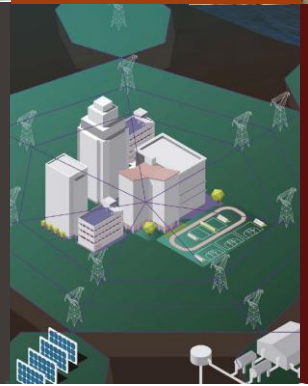
Engineering for Sustainability

Energy

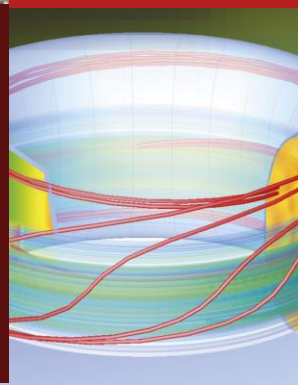
Data Science



Integrated design, architecture and sustainability



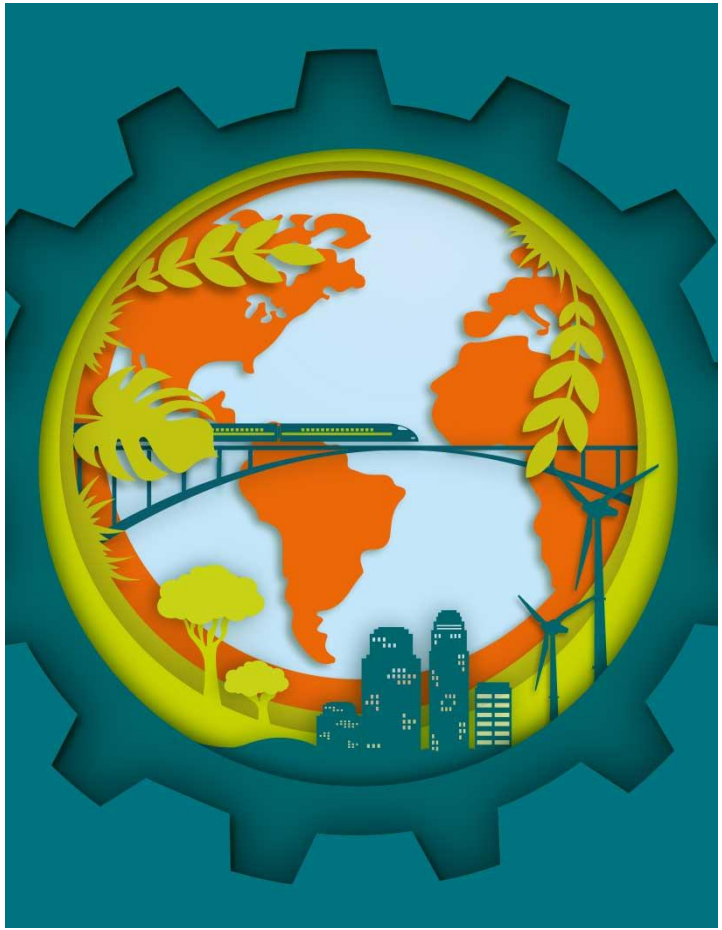
Management, technology and entrepreneurship



Selecting a minor provides an excellent opportunity to develop specific competencies (e.g. energy) within the SIE Master programme

Minor Engineering for Sustainability

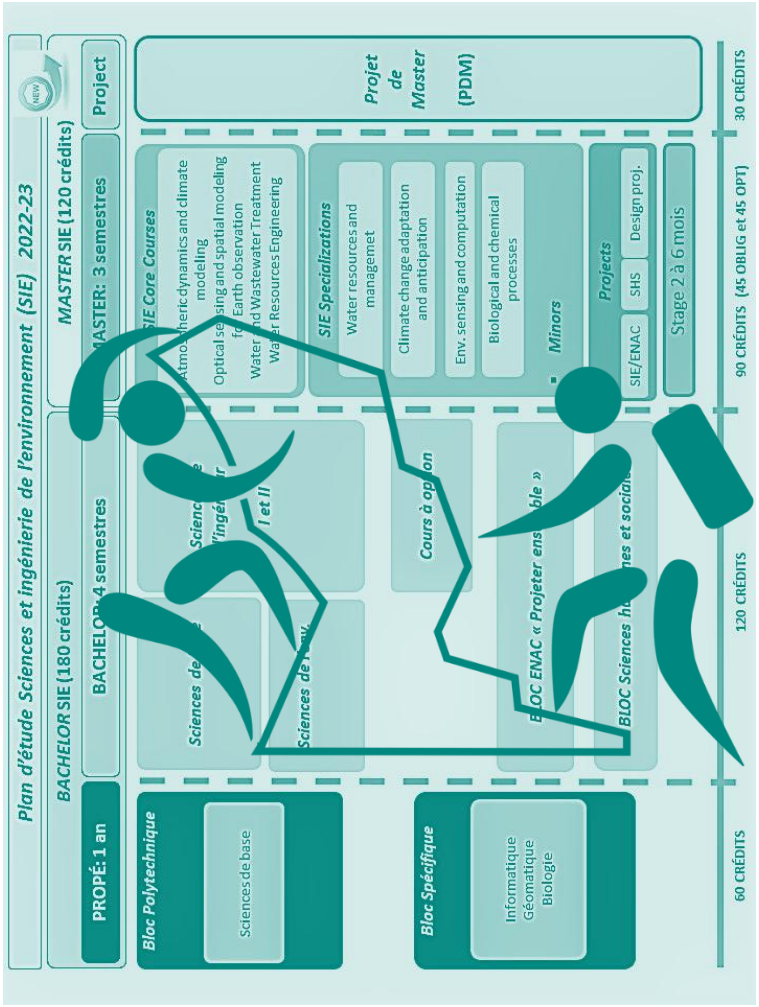
- Contribute to **sustainability in your future profession** and add a sustainability focus to your diploma
- Develop new competences to tackle **complex sustainability challenges**: take attractive courses from outside your section; discover new disciplines, tools and approaches
- Carry out an **interdisciplinary 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

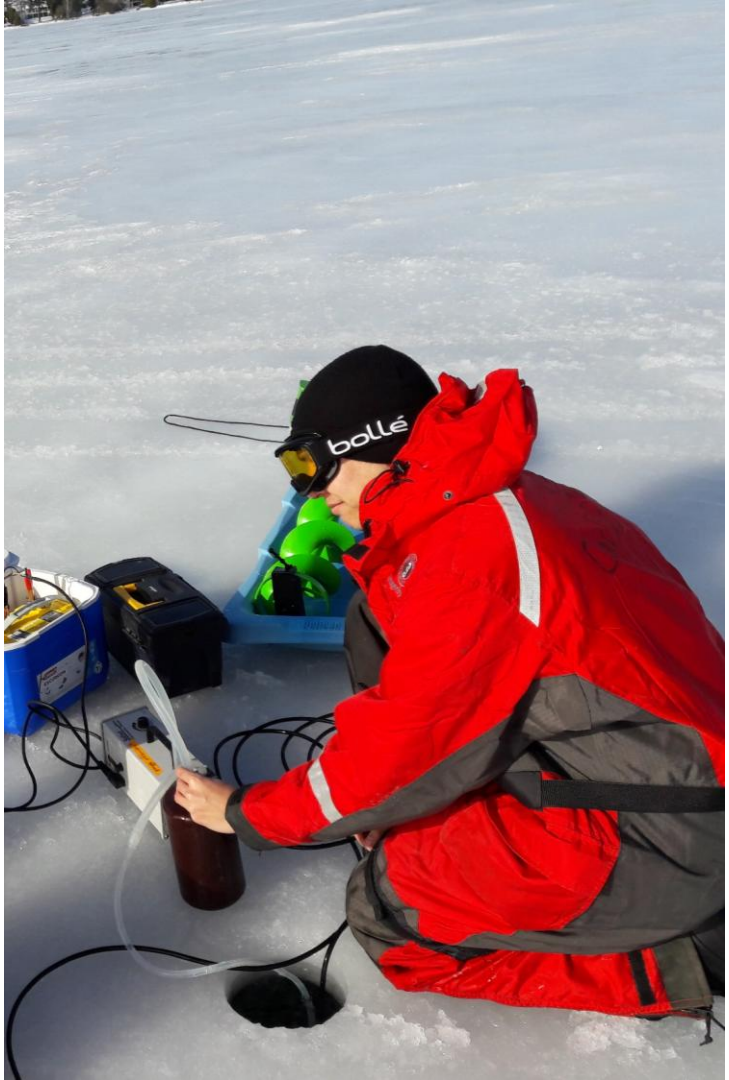
- **Greater flexibility towards smart combinations**

- **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 administrations
- **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

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

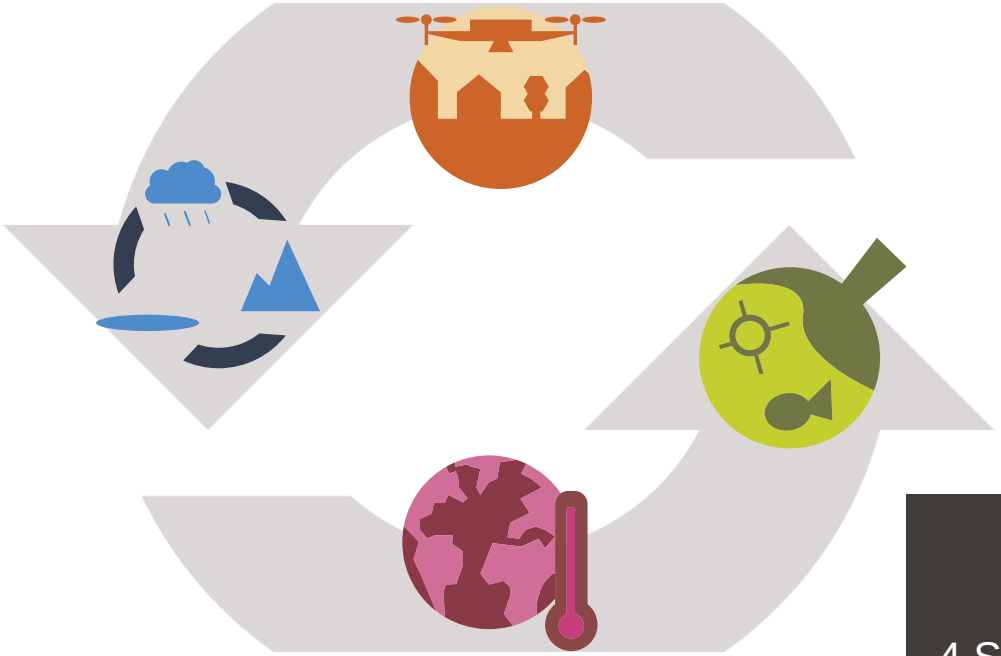
Important links

- **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

École polytechnique fédérale de Lausanne

Contact: pierre-yves.gillieron@epfl.ch



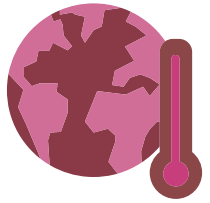
SIE Master Program 2025-26

4 Specializations

Water Resources and Management

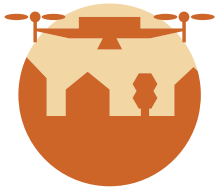
Spécialisation D: Water Resources and Management			Resp.: Tom Battin		60	
ENV-509	Applied Wastewater Engineering		Mattle	SIE	3	
ENV-526	Climate and Water Sensitive Urban Design		Manoli	SIE	4	
ENV-418	River eco-morphodynamics and bioengineering		De Cesare /Gostner/Perona	GC	4	
ENV-411	Ecohydrological modeling		Bonetti	SIE	4	
ENV-512	Global change ecology and fluvial ecosystems		Battin	SIE	4	
ENV-504	Groundwater and soil remediation		Bernier-Latmani	SIE	4	
CIVIL-410	Hydraulique fluviale et aménagement de cours d'eau		André/Arborino/De Cesare	GC	3	
ENV-523	Hydrogeophysics		Holliger K.	SIE	3	
ENV-417	Hydrologie urbaine		Rossi L.	SIE	4	
ENV-549	Irrigation and drainage engineering		Perona	GC	4	
ENV-425	Limnology		Pasche	SIE	5	
ENV-525	Physics and hydrology of snow		Huwald/Lehning	SIE	4	
ENV-524	Risques hydrologiques et aménagements		Ancey	GC	3	
ENV-402	Water and sanitation for development		Lüthi	SIE	3	
CVIL-413	Urban Hydraulic Systems		Pfister	GC	3	
CIVIL-466	Water resources engineering and management		Perona/Bieri/Leite Ribeiro	SIE	5	core course

Climate Change Anticipation & Adaptation



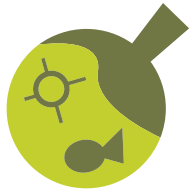
Spécialisation E: Climate Change Anticipation and Adaptation			Resp.: Athanasios Nenes		65	
ENV-409	Air pollution		Takahama/Reimann	SIE	5	
ENV-422	Applied Ecology		Grossiord	SIE	4	
ENV-407	Atmospheric processes: from cloud to global scales		Berne/Nenes/Gehring	SIE	5	core course
ENV-526	Climate and Water Sensitive Urban Design		Manoli	SIE	4	
URB-405	Ecological contributions to cities in transformation		Jessel	AR	3	
ME-409	Energy conversion and renewable energy		Maréchal/Nguyen T.-V.	GM	4	
ENG-474	Etudes d'impact sur l'environnement		Schmidt/Devanthéry/Chopard	GC	3	
ENV-444	Exploratory data analysis in environmental health		Joost/Nehme	SIE	4	
ENV-417	Hydrologie urbaine		Rossi L.	SIE	4	
ENV-540	Image processing for earth observation		Tuia	SIE	4	
ENV-525	Physics and hydrology of snow		Huwald/Lehning	SIE	4	
ENV-524	Risques hydrologiques et aménagements		Ancey	GC	3	
ENV-410	Science of climate change		Schmale	SIE	4	
ENV-461	Sustainability assessment of urban systems		Binder/Heinrich	SIE	3	
URB-401	Systems approaches for urban transitions		Binder/Hecher/Jessel	SIE	4	
ENV-413	Thermodynamics of the Earth Systems		Nenes	SIE	4	
ENV-462	Urban Green&Blue infrastructure and global warming		Kazemi	SIE	3	

Environmental Sensing and Computation



Spécialisation F: Environmental Sensing and Computation			Resp.: Devis Tuia		61	
ENV-409	Air pollution		Takahama/Reimann	SIE	5	
CS-401	Applied data analysis		West/Brbic	SC	8	
MICRO-452	Basics of Mobile Robotics		Mondada	MT	4	
ENG-466	Distributed intelligent systems		Martinoli	SIE	5	
ENG-420	Environmental transport phenomena		Porte-Agel/Crouzy	SIE	5	
ENV-444	Exploratory data analysis in environmental health		Joost/Nehme	SIE	4	
MICRO-511	Image processing I		Unser/Van de Ville	MT	3	
MICRO-512	Image processing II		Liebling/Sage/Unser /Van de Ville	MT	3	
ENV-540	Image processing for earth observation		Tuia	SIE	4	
CIVIL-460	Indoor air quality and ventilation		Licina	GC	4	
ENV-521	Multivariate statistics in R		Peter H.	SIE	4	
ENV-408	Sensing and spatial modeling for earth observation		Skaloud/Berne/Tuia	SIE	5	core course
ENV-548	Sensor orientation		Skaloud	SIE	4	
ENV-530	Sustainability Robotics		Kovac	SIE	**3**	

Biological and Chemical Processes in Environmental Engineering



génierie de l'Environnement

Spécialisation G: Biological and Chemical Processes in Environmental Engineering			Resp.: Rizlan Bernier-Latmani		58	
ENV-422	Applied Ecology		Grossiord	SIE	4	
ENV-509	Applied Wastewater Engineering		Mattle	SIE	3	
ENV-507	Fate and behaviour of environmental contaminants		Aeppli	SIE	4	
ENV-512	Global change ecology and fluvial ecosystems		Battin	SIE	4	
ENV-504	Groundwater and soil remediation		Bernier-Latmani	SIE	4	
ENV-523	Hydrogeophysics		Holliger K.	SIE	3	
ENV-417	Hydrologie urbaine		Rossi L.	SIE	4	
ENV-425	Limnology		Tofield-Pasche	SIE	5	
ENV-501	Material flow analysis and resource management		Binder/Del Campo	SIE	4	
ENV-412	Microbial Ecology		Altshuler	SIE	4	
ENV-521	Multivariate statistics in R		Peter H.	SIE	4	
ENV-468	Occupational and environmental health		Vernez	SIE	3	
ENV-402	Water and sanitation for development		Lüthi	SIE	3	
ENV-500	Solid waste engineering		Ludwig	SIE	4	
ENV-405	Water and wastewater treatment		Gu/Merle	SIE	5	core course