

ENV-461

**Sustainability assessment of urban systems**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Electrical and Electronical Engineering	MA2, MA4	Opt.
Energy Science and Technology	MA2, MA4	Opt.
Energy minor	E	Opt.
Environmental Sciences and Engineering	MA2, MA4	Opt.
Minor in Engineering for sustainability	E	Opt.
Minor in Integrated Design, Architecture and Sustainability	E	Opt.
Territories in transformation and climate minor	E	Opt.
Urban Planning and Territorial Development minor	E	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
<b>Hours</b>	<b>3 weekly</b>
Lecture	2 weekly
Project	1 weekly
<b>Number of positions</b>	

**Summary**

This course enables students to think critically about sustainability and to carry out a sustainability assessment based on problems of urban areas. At the end of the course, students are able to develop their own sustainability assessment using the Sustainability Solution Space methodology.

**Content**

Sustainability assessments should ensure that the human activities make an optimal contribution to a sustainable development. Although sustainability assessments are yet widely used, several issues are problematic: What is a "good" method to evaluate the sustainability of urban systems? How can we decide upon what is sustainable, specifically in the context of urban systems? What role do normative and systemic aspects play in assessing sustainability?

This course is built to provide methodological and theoretical content to the students on sustainability issues, to enable well-conceived sustainability assessments for cities around the world. At the end of the course students are able to develop their own sustainability assessment with the Sustainability Solution Space methodology. Some the key questions of the course are listed below.

- What is a sustainability assessment?
- What are the key sustainability issues in urban areas ?
- What are the systemic, normative, and procedural aspects of sustainability assessments ?
- What is the difference between sustainability and resilience ?
- How can we develop policy options using a sustainability solution space (SSP) ?
- How can we understand sustainability assessments and its policy implications within their context ?

**Keywords**

- Sustainability assessment of urban systems
- Sustainability issues in urban systems
- Systemic, normative and procedural aspects of sustainability assessment
- Sustainability solution space
- Interdisciplinary work
- Science-policy interface

**Learning Outcomes**

By the end of the course, the student must be able to:

- Distinguish between systemic, normative and procedural aspects of sustainability
- Design a study in which the assessment method can be applied in a meaningful way
- Apply the methods relevant for sustainability analysis to a specific problem
- Apply the sustainability solution space methodology to a real-world problem
- Formulate a critical perspective on sustainability assessment

### Transversal skills

- Access and evaluate appropriate sources of information.
- Continue to work through difficulties or initial failure to find optimal solutions.
- Communicate effectively with professionals from other disciplines.
- Identify the different roles that are involved in well-functioning teams and assume different roles, including leadership roles.
- Make an oral presentation.
- Assess one's own level of skill acquisition, and plan their on-going learning goals.
- Demonstrate the capacity for critical thinking

### Teaching methods

Lectures, exercises, group project with the presentation of a poster, flipped classroom sessions. This course also offers a series of tools to adapt to students' learning patterns by alternating learning modes, and by offering a wide variety of teaching materials (slides, scientific articles, MOOC extracts, quizzes). To anchor the questions and answers formulated throughout the course, professionals are invited to share their experiences.

### Expected student activities

We expect students to attend to the lectures and the exercises offered. The lectures and exercises will be closely interlinked and taught openly within the three hours allocated to the course. They are expected to develop their own case study, perform a sustainability assessment and a critical review of another sustainability assessment

### Assessment methods

The students will be evaluated as follows:

- Group project (30%):
  - Presentation of the work (10%)
  - Elaboration of a poster (20%)
- Critical evaluation of other projects (10%)
- Final exam (60%)

30% of the final mark will be determined by the group work and 70% (final exam and critical assessment) will be individual.

### Supervision

Office hours	Yes
Assistants	Yes

### Resources

#### Bibliography

Videos, articles, slides will be uploaded on Moodle.

References will be shared throughout the course to provide additional material. The course is based on the following book, which is freely available from EPFL.  
Binder CR, Wyss R, Massaro E, eds. In: *Sustainability Assessment of Urban Systems*. Cambridge University Press; 2020:i-ii.  
Access here

**Moodle Link**

- <https://go.epfl.ch/ENV-461>