

ENV-167

**Introduction to environmental engineering**

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<b>Cursus</b>	<b>Sem.</b>	<b>Type</b>
Environmental Sciences and Engineering	BA1	Obl.

Language of teaching	English
Coefficient	4
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
<b>Hours</b>	<b>4 weekly</b>
Courses	2 weekly
Exercises	2 weekly
<b>Number of positions</b>	

**Summary**

This introduction to Environmental Engineering is meant to show the students how upcoming courses in mathematics, physics, chemistry, biology and other areas will be used to gain a scientific understanding of environmental problems and then help to solve them.

**Content**

Topics covered include (among other topics) environmental engineering concepts, water quality and treatment, risk analysis and management, forecasting, groundwater management and remediation, resource use, energy production, air pollution, climate processes, past, current and future climate.

**Keywords**

Water pollution, wastewater treatment, groundwater pollution, remediation, wells, exponential growth, logistic model, water resources, air pollution, climate, climate change

**Learning Prerequisites****Important concepts to start the course**

Basic knowledge (high school level) in mathematics, physics, chemistry and biology

**Learning Outcomes**

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

- Identify correct and wrong statements and argue why
- Solve simple problems on water pollution and wastewater treatment
- Describe steady groundwater flow using Darcy's Law
- Recognize different mechanisms controlling fate of contaminants in groundwater
- Derive rates of change in environmental and human systems
- Explain the physical, chemical and microbial processes that influence the security of nuclear waste disposal
- Recognize important chemical actors in air pollution and their impacts on public health and the environment
- Explain the main drivers of past, present and future climate

**Teaching methods**

Lecture ex cathedra and exercises

**Expected student activities**

(i) prepare the lectures by reading the parts of the textbook indicated on Moodle, (ii) work on the problems before coming to the exercise sessions

### **Assessment methods**

During the semester, three written tests, each counting for 1/3 grade and lasting 90 min.

### **Resources**

#### **Bibliography**

Masters G.M. & Ela W.P. Introduction to Environmental Engineering and Science, 3rd edition, 2008, Prentice Hall.

#### **Ressources en bibliothèque**

- [Introduction to Environmental Engineering and Science / Masters](#)

#### **Moodle Link**

- <http://moodle.epfl.ch/course/view.php?id=501>