ENV-167

Introduction to environmental engineering

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Cursus	Sem.	Type
Environmental Sciences and Engineering	BA1	Obl.

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

Summary

This introduction to Enviromental 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, and climate change.

Keywords

Water pollution, wastewater treatment, groundwater pollution, remediation, wells, exponential growth, logistic model, water resources, air pollution, greenhouse gases, 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 and chemical processes that govern natural and human-induced climate change
- Recognize important chemical actors in air pollution and their environmental impacts

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 exercice sessions

Assessment methods

Three written tests during the semester, each 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