ENV-507

Fate and behaviour of environmental contaminants

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Cursus	Sem.	Type
Energy Management and Sustainability	MA1, MA3	Opt.
Environmental Sciences and Engineering	MA1, MA3	Opt.

Language of teaching	English
Credits	4
Session	Winter
Semester	Fall
Exam	Written
Workload	120h
Weeks	14
Hours	**3 weekly**
Lecture	2 weekly
Exercises	1 weekly
Number of positions	

Summary

The student will learn the important processes that control the transport and transformation of organic chemicals and pathogens in the environment, as well as the formulation and solution of quantitative models to describe these processes.

Content

- Phase transfer processes, e.g., sorption and air-liquid partitioning
- Mass transfers through boundary layers, kinetics of air-water exchange
- Structure-Activity relationships
- Transformation reactions of chemicals in the environment: substitution, elimination, hydrolysis reactions, photolysis
- Introduction to biologcial contaminants (pathogens) and their fate in the environment

Keywords

organic pollutants
pathogens
aquatic system
mass transfer
transformation reactions
kinetics

Learning Prerequisites

Required courses

General chemistry

Recommended courses

Environmental chemistry
Environmental microbiology

Important concepts to start the course

Interest in chemical and microbiological processes in the aquatic environment

Learning Outcomes

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

- Anticipate the important processes that control the fate of acquatic contaminants

- Formulate models that quantify that fate
- Solve those models, e.g., to determine chemical half lives

Transversal skills

- Collect data.
- Access and evaluate appropriate sources of information.
- Make an oral presentation.
- Write a scientific or technical report.

Teaching methods

Ex cathedra
Excercises
Student project

Expected student activities

Attend lectures and exercise sessions.
Complete assigned exercises.
Prepare independently for exams.
Prepare and present an independent project.

Assessment methods

Independent project (50 %)
Final exam (50 %)

Supervision

Office hours	No
Assistants	No
Forum	No

Resources

Bibliography

Schwarzenbach et al., "Environmental Organic Chemistry" (will be provided)

Ressources en bibliothèque

- Environmental Organic Chemistry / Schwarzenbach et al.

Notes/Handbook

Class handouts will be provided