

ENV-507

**Fate and behaviour of environmental contaminants**

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Cursus	Sem.	Type
Energy Management and Sustainability	MA2, MA4	Opt.
Environmental Sciences and Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	Written
Workload	120h
Weeks	14
<b>Hours</b>	<b>3 weekly</b>
Courses	2 weekly
Exercises	1 weekly
<b>Number of positions</b>	

**Summary**

The student will learn the important processes that control the transport and transformation of organic chemicals 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 biological contaminants (pathogens) and their fate in the environment

**Keywords**

organic pollutants  
 aquatic system  
 mass transfer  
 transformation reactions  
 kinetics

**Learning Prerequisites****Required courses**

General chemistry

**Recommended courses**

Environmental chemistry

**Important concepts to start the course**

Interest in chemical 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 aquatic 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

Exercices

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