

ENV-306

Ecotoxicology

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

Language of teaching	English
Credits	4
Session	Summer
Semester	Spring
Exam	During the semester
Workload	120h
Weeks	14
Hours	4 weekly
Courses	2 weekly
Exercises	1 weekly
TP	1 weekly
Number of positions	

Summary

Ecotoxicology aims to understand the impact of chemicals and other stressors on organisms in the environment with a particular focus on population-, community- and ecosystem effects. Based on a mechanistic understanding, the ultimate goal is to be able to protect the respective environment.

Content

This course focuses on basic concepts in ecotoxicology and mechanistic consideration for risk assessment. Topics include:

- Source and behavior of chemicals in the environment
- Bioavailability
- Organisms and biological test protocols
- Quantification of biological effects
- Toxicokinetics (Processes of internal distribution, metabolism and excretion)
- Toxicodynamics (Processes leading to effects in organisms)
- Linking effects from molecular to ecosystem response
- Concepts of dealing with chemical mixtures, multiple stressors and organisms
- Environmental risk assessment

Keywords

Fate and effect of chemicals in the environment, environmental toxicology, risk assessment

Learning Prerequisites**Recommended courses**

Some basic knowledge in environmental chemistry and biology are of advantage

Learning Outcomes

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

- interpret chemical properties

- compute chemical distribution
- evaluate toxicity data
- judge chemical risks
- anticipate modes of toxic action
- synthesize information regarding risks of chemicals
- characterize ways of exposure in environment
- characterize chemical distribution in an organism

Transversal skills

- Collect data.
- Make an oral presentation.
- Access and evaluate appropriate sources of information.
- Plan and carry out activities in a way which makes optimal use of available time and other resources.
- Use a work methodology appropriate to the task.
- Evaluate one's own performance in the team, receive and respond appropriately to feedback.
- Negotiate effectively within the group.
- Take responsibility for health and safety of self and others in a working context.

Teaching methods

Lecture and exercises. Exercises focus on practical issues, such as estimation of exposure based on knowledge on chemical characteristics and interpretation of ecotoxicological information available from public databases.

Note: this course will be taught primarily on-line via zoom.

Expected student activities

working in pairs on semester exercise (data base search and interpretation); working on exercises throughout the course; preparing a poster and presenting it at the end of the course

Assessment methods

Exercises 20 %, written exam 80 % (closed books)

Supervision

Office hours	Yes
Assistants	Yes
Forum	No
Others	contact via email

Resources

Notes/Handbook

The material covered will be available as pdf on moodle prior to each class.

Moodle Link

- <https://go.epfl.ch/ENV-306>

Prerequisite for

Fate and behaviour of organic pollutants (master)