Aquatic ecotoxicology and environmental monitoring

2025 - 2026

Is part of the next programmes:

- M0037000 Master of Science in Marine and Lacustrine Science and Management

- U0001008 Courses open to exchange students in Sciences

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Course Code:	2009WETOLA
Study Domain:	Biology
Semester:	1E SEM
Contact Hours:	30
Credits:	6
Study Load (hours):	168
Contract Restrictions:	Exam contract not possible
Language of Instructions:	ENG

Lecturer(s):	T Lieven Bervoets C Adrian Covaci C Kayawe Valentine Mubiana C Victor Wepener
Examperiod:	exam in the 1st semester

1. Prerequisites *

speaking and writing of:

- English

specific prerequisites for this course

Students have a basic knowledge in biology, especially regarding some general ecological processes, and a have a basic knowledge in chemistry

2. Learning outcomes *

- Students have a basic insight into aquatic ecotoxicology. And environmental monitoring
- Students know the most important types of (micro) pollutants that might enter the aquatic environment and know their sources.
- Students have insight into the factors that affect the distribution, partitioning and bioavailability of pollutants in the aquatic environment
- Students know the range of chemical and biological tests and test systems that can be used to evaluate the effect of toxicants on the environment at different levels of biological organisation.
- Students know how environmental quality standards are derived and how a risk evaluation of new compounds is developed
- The students have insight in the distribution, analysis and effects of persistent organic pollutants (POPs)

3. Course contents *

This course introduces the fields of aquatic ecotoxicology, environmental monitoring and the different steps in ecological risk assessment. It gives insight in (1) the factors that determine the distribution and mobility of chemicals in the environment. For instance variables such as the pH, salt and temperature or the role of bacteria in redox processes are factors which will have a considerable influence on metal behaviour in soils or sediments. The next step (2) is understanding how contaminants move from the environment into organisms (bioaccumulation). Then (3) processes which result in internal deactivation will be explained to finally gain knowledge on (4) effects of chemicals on biota. These effects and the general risk assessments procedures are explored from sub-organismal level up to higher levels of organisation (individuals, populations, communities, ecosystems).
Examples of topics that will be discussed include:
The effects of micro pollutants on biota; diagnosis; how biota differ in resistance and tolerance; methods to evaluate, reduce and remedy effects; case studies.
The sources, distribution and behaviour in the environment, characteristics and degradation/transformation of persistent organic pollutants (POPs).
Techniques to measure POPs in environmental and biological samples
The development of water quality guidelines under the EU Water Framework Directive
Risk evaluation of single compounds.

4. International dimension *

- This course stimulates international and intercultural competences.
- Students use course materials in a foreign language.
- The lecturer invites international guest lecturers.
- Students give presentations in a foreign language.
- Students compare the course contents in an international context.
- The lecturer collaborates with an international partner (fe. joint course materials, joint case studies).

In this course several examples of distribution and effects of micro pollutants in the aquatic environment are discussed and this across different climate regions, ranging from the tropics to the arctic. Studies will be discussed on POPs, metals and other contaminants in among others Congo, Tanzania, South Africa, Bolivia, Greece, Belgium and Norway.
The students are originating from different parts of the world and in one of the assignments they have to present

5. Teaching method and planned learning activities

5.1 Used teaching methods *

Class contact teaching

- Lectures
- Skills training

Personal work

5.2 Planned learning activities and teaching methods

This course consists of eight theoretical lessons of three hours each
In addition a desktop excercise is given

5.3 Facilities for working students *

Classroom activities

- no specific facilities

6. Assessment method and criteria *

6.1 Used assessment methods *

6.2 Assessment criteria *

7. Study material

7.1 Required reading *

hand outs of the lessons

7.2 Optional reading

The following study material can be studied voluntarily :

papers and text books provided via Black Board

8. Contact information *

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9. Tutoring