GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2024-2025

Chemical Risk Assessment (C004164)

Course size *(nominal values; actual values may depend on programme)*

Credits 3.0 **Study time 90 h**

Course offerings in academic year 2025-2026

A (semester 2) English Gent

Lecturers in academic year 2025-2026

Elskens, Marc	VUB	lecturer-in-charge

Offered in the following programmes in 2025-2026	crdts	offering
Master of Science in Teaching in Science and Technology(main subject Chemistry)	3	A
Master of Science in Chemistry(main subject Analytical and Environmental Chemistry)	3	A
Master of Science in Chemical Engineering	3	A
Master of Science in Chemical Engineering	3	A

Teaching languages

English

Keywords

Risk identification and characterization, impact assessment, exposure assessment, dose-response curves.

Position of the course

This course provide an overview of the methods needed to examine the impact of micropollutants on the ecosystems and how human and environmental risks can be assessed. In the theoretical part of the course, processes such as the fate, transport, distribution (speciation) of micropollutants are discussed. Quantitative tools (models and/or indicators) are used to illustrate the integration of these processes within a risk assessment perspective.
General objectives are:

- To increase student experience in the use of computer software and spreadsheets;
- To learn how to report and communicate scientific results;
- To sensitize students with the evolution of the society and their consequences for the environment and public health;

Contents

1 General Introduction to ecological and human health risk assessment
  1 Risk assessment frameworks
2 Variability, uncertainty and probability
  1 Sources of unpredictability
  2 Probabilistic analyses
  3 Techniques for analysis of variability and uncertainty
  4 Probability in the risk assessment process
  5 An introduction to fuzzy methods
3 Exposure to micropollutants in the environment
  1 Basic modelling concept
  2 Exposure models
  3 Exposure-response relationships
  4 Biological surveys
4 Risk Characterization
  1 Criteria and benchmarks
  2 Integrating exposure and exposure response (e.g., the impact indicators for

biocides)
3 Screening characterization (e.g., risk assessment with the “CALUX” bioassay)
5 Exposure and risk assessment of nanoparticles (aerosols) in the environment
6 Risk management
1 Reporting and communicating risks
2 Decision making
Content: Exercises Practical application of concepts and methods shown in the course

Initial competences

General knowledge of biology, chemistry and statistics.

Final competences

1 Regulation of chemicals.
2 Design of impact indicators for biocides and pesticides.
3 Chemical equilibrium modelling system for trace elements.
4 Management of watersheds and other environmental management problems.

Conditions for credit contract

Access to this course unit via a credit contract is determined after successful competences assessment

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Seminar, Lecture

Study material

None

References

Course content-related study coaching

Assessment moments

end-of-term assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment

Examination methods in case of periodic assessment during the second examination period

Oral assessment

Examination methods in case of permanent assessment

Possibilities of retake in case of permanent assessment

not applicable

Calculation of the examination mark

Oral examination following a written preparation of the answers:
- 75% for the theory (two questions)
- 25% for the exercise (one question)