UNIVERSITY OF GOTHENBURG

DEPARTMENT OF BIOLOGICAL AND ENVIRONMENTAL SCIENCES

BIO430 Ecological Toxicology: Ecology, 15 credits

Ekotoxikologi med ekologisk inriktning, 15 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Faculty of Science on 2010-10-26 and was last revised on 2024-03-07 by Department of Biological and Environmental Sciences to be valid from 2024-03-07, spring semester of 2024.

Field of education: Science 100%
Department: Department of Biological and Environmental Sciences

Position in the educational system

This course is mandatory for the master program in ecotoxicology, N2TOX. It can also be taken as a free-standing course, and be included as an elective course in other programs such as the masters program in biology or environmental science.

The course can be part of the following programme: 1) Ecotoxicology, Master's Programme (N2TOX)

Main field of studies	*Specialization*
Biology	A1N, Second cycle, has only first-cycle course/s as entry requirements
Environmental Science	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

At least 90 credits in natural sciences (biology, chemistry, ecology, earth-, environmental-, marine sciences) with a minimum of 30 credits in biology and 30 credits in chemistry, or 60 credits in biology. These prerequisites can be waived if an applicant has verifiable equivalent knowledge/skills. The course ES1305, 15 credits can be counted within the requested 90 credits above. Applicants must prove their knowledge of English corresponding to English 6/English B from Swedish upper secondary school. For more

information, see English language requirements on Universityadmissions.se.

Learning outcomes

After completing the course the student is expected to:

Knowledge and understanding

- Summarise pros and cons with ecotoxicological studies on different biological organisational levels
- Describe approaches and methods in community ecotoxicology for evaluating effects on function and structure
- Relate the conceptual understanding of models used to predict mixture toxicity
- Describe principles for transport and fate of chemical in the environment
- Describe principles for sampling and evaluation of chemical status on the environment

Competence and skills

- Implement different experimental ecotoxicological methods for communties
- Handle and analyse uni- and multivariate data
- Collect and evaluate scientific information on mode of action, use and ecological effects of chemicals
- Present and discuss scientific knowledge orally and in writing, both in a scientific and popular science context

Judgement and approach

- Critically compare and evaluate designs, methodology and analyses of ecotoxicological experiments
- Critically evaluate the suitability of experimental methods in community ecotoxicology
- Discuss problems connected to causality in experimental and field studies

The course is sustainability-focused, which means that at least one of the learning outcomes clearly shows that the course content meets at least one of the University of Gothenburg's confirmed sustainability criteria. The content also constitutes the course's main focus.

Course content

The course is fulltime over approximately ten weeks. Teaching comprises of lectures, computer exercises, seminars, laboratory work, written and oral communication, as well as individual work.

Sub-courses

1. **Part 1 Practicals** *(Delkurs 1 Praktik),* 7 credits

   Grading scale: Pass (G) and Fail (U)
   The course is laboratory intensive with the aim to provide familiarity with ecotoxicological methods to describe and evaluate effects of chemicals primarily on aquatic communities. Field sampling and model ecosystems are parts of the laboratory exersices and can in part take place at Kristineberg's marine research station, Fiskebäckskil.

   Other practicals are computer exercises, student seminars, a poster presenting, oral and written reports. The combination of these practicals can vary year to year.

2. **Part 2 Theory** *(Delkurs 2 Teori),* 8 credits

   Grading scale: Pass with Distinction (VG), Pass (G) and Fail (U)
   The aim of the theoretical part is to complement and expand knowledge in ecotoxicology, primarily on population, community, and ecosystem level.

   Ecotoxicological principles, approaches and measuring techniques with emphasis on effects on ecological systems is treated in the course.

   The course covers the scientific basis for the applied parts of ecotoxicology and aims to provide a critical perspective to ecotoxicological approaches and methods.

   The course is mainly directed at aquatic environments, but contains terrestial elements. The course also contains a certain degree of orientation in adjacent sciences and applied areas such as environmental chemistry and monitoring.

Form of teaching

The course consists of lectures, laboratory exercises, seminars, computer exercises, literature projects, including presentations of these.

Language of instruction: English

Assessment

Sub-course 1: Practicals, 7 credits
The mandatory components of the course include laboratory work, field work, and other practical group activities as specified in the course schedule. If a student doesn't finish sub-course one, they might be able to participate the next time the course is given, but only if space is available.

Sub-course 2: Theory, 8 credits
The sub-course is assessed through a written examination at the end of the course. Content from both sub-courses can be included.

If a student who has twice received a failing grade for the same examination component

wishes to change examiner ahead of the next examination session, such a request should be made to the department in writing and should be approved by the department unless there are special reasons to the contrary (Chapter 6 Section 22 of the Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for study support for students with disabilities, the examiner may, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, decide to allow the student to sit an adjusted exam or alternative form of assessment.

In the event that a course has ceased or undergone major changes, students are to be guaranteed at least three examination sessions (including the ordinary examination session) over a period of at least one year, but no more than two years after the course has ceased/been changed. The same applies to internships and professional placements (VFU), although this is restricted to just one additional examination session.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).
Both sub-courses must be passed in order for a final grade to be given for the course. To achieve a passing grade on the course, a normal requirement is to achieve at least 60% on the written examination, as well as pass grade on all mandatory components. To achieve a grade of pass with distinction, a normal requirement is to achieve at least 80% on the written examination (sub-course 2) as well as pass grade on the mandatory practical components (sub-course 1).

Course evaluation

An oral course evaluation will be held at the final course conference. An anonymous written course evaluation will be conducted electronically after the course. The evaluation is of great value in our quality work. A summary of the course evaluation will be presented on the course Canvas page along with a summary of the course evaluation and information about any changes made for the next year.

Additional information

The course is part of the international course offering and is always taught in English, and all literature is in English. We do not use a course book but scientific articles that are available on the course Canvas page. There, you can also find a list of recommended books that provide a good background on the subject and are suggested reading for those with little prior experience and knowledge in ecotoxicology.

Travel to and from and stay at the field station will incur a cost for the student.

Animal experiments may occur during the course.