Faculty of Science

BIOR52, Biology: Applied Ecotoxicology, 15 credits

Biologi: Tillämpad ekotoxikologi, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-05-10 and was last revised on 2015-01-19. The revised syllabus applies from 2015-01-19, spring semester 2015.

General Information

The course is an optional second-cycle course for a degree of Bachelor or Master of Science in Biology and Environmental Sciences.

Language of instruction: Swedish

Main field of studies	*Depth of study relative to the degree requirements*
Biology	A1F, Second cycle, has second-cycle course/s as entry requirements
Environmental Science	A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

Knowledge and understanding

On completion of the course the student shall be able to:

- describe ecotoxicological theory, methodology and applications
- account for ecological and physical/chemical conditions for the occurrence and effects of pollutants in nature
- describe methods to determine the environmental risks of chemical substances
- account for how different types of pollutants can be identified and quantified in the air, water, soil, and biota

- master statistical analyses and toxicological statistics
- account for national regulatory frameworks and procedures for control of chemical products, and the most important actors within the sector and which responsibility they have

Competence and skills
On completion of the course the student shall be able to:

- plan and carry out ecotoxicological experiments, routine tests and monitoring of pollutants
- analyse ecotoxicological information
- present ecotoxicological information for non experts orally and in writing
- produce a poster

Judgement and approach
On completion of the course the student shall be able to:

- critically evaluate ecotoxicological issues and standpoints
- acquire and critically review ecotoxicological information, independently and in groups
- show knowledge about the forefront of ecotoxicological research

Course content

The course is a specialisation and vocational guidance in the subject ecotoxicology. The course gives the students training and knowledge for professions where ecotoxicological skills are needed. It gives a holistic perspective on pollutants where dispersal, chemical properties, persistence, and effects from cell to ecosystem level, are studied. Risk management in the society is addressed. The course contains environmental chemistry, effect-oriented, and applied, ecotoxicology. The environmental chemistry and effect-oriented ecotoxicology constitute the theoretical basis necessary for understanding and interpretation of ecotoxicology-related environmental problems. The applied material consists of knowledge of community or technical use for solving or handling ecotoxicologically-related problems.

Topics included in the course:

- biochemical and physiological mechanisms for response and effect
- ecological mechanisms for effects and injuries
- the pollutant's inherent properties and distribution in the environment
- transformation processes, conversion, decomposition and metabolism
- analytical methods, persistent organic substances, pesticides and inorganic pollutants
- environmental monitoring, regulation and control methods
- toxicological and ecotoxicological testing methods
- risk assessment, risk analysis, and risk management
- decontamination and remediation
- pollutants in a global perspective
- Swedish chemistry policy; guidelines, actors, and implementation

Course design

The teaching consists of lectures, group work, demonstrations, laboratory sessions, independent projects and study visits. Problem-oriented teaching, study visits with interviews, laboratory sessions with presentations, and the applied assignment are important parts training the students for future work. Participation in all parts except lectures is compulsory. The course mainly consists of three parts: seminars, laboratory project in groups, and an individual applied assignment. The seminars consist of oral presentations of selected articles or book chapters followed by questions and discussion. The assignment is a literature project ordered by an external stakeholder. The laboratory project and the applied assignment continue throughout the course. The laboratory project is presented partly as a scientific article and partly as a poster. The applied assignment is presented as a written report as well as orally at the end of the course when the posters are presented and evaluated during two conference days, which are open to the public. The conference is arranged by the students. After the conference, the course director and the employer give individual feedback on the students' achievements.

Assessment

Examination takes place at the end of the course through an evaluation of the total actions of the student during the course.

For students who have not passed the regular examination, an additional examination in close connection to this is offered.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved laboratory reports, approved written assignments, approved project report, and participation in all compulsory parts, are required.
The final grade is decided through a weighing of the results of the parts that are included in the examination.

Entry requirements

For admission to the course, English 6/English B and 105 credits of scientific studies including knowledge corresponding to either BIOC02 Ecology 15 credits, 15 credits Chemistry, and BIOR41 Ecotoxicology 15 credits, or KEMB06 Analytical Chemistry 15 credits, are required.

Further information

The course may not be included in a degree together with BIO791 Ecotoxicology 2, 15 credits.

Subcourses in BIOR52, Biology: Applied Ecotoxicology

Applies from V08

0701 Applied Ecotoxicology, 15,0 hp
Grading scale: Fail, Pass, Pass with distinction