

Faculty of Science

### MVEN13, Environmental Science: Analysis and Methodology, 15 credits Miljövetenskap: Analys och metodik, 15 högskolepoäng Second Cycle / Avancerad nivå

# Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2021-02-03 and was last revised on 2022-12-09. The revised syllabus applies from 2022-12-09, autumn semester 2023.

# **General Information**

The course is a compulsory second-cycle course for a degree of Master of Science in Environmental Science or Environment Health Science. The course is also an optional course in the second-cycle for a degree of Master of Science in Applied Computational Science with specialization in Environmental Science.

*Language of instruction:* Swedish and English The course is given in Swedish, but can be offered in English if necessary.

Main field of studies	Depth of study relative to the degree requirements
Environmental Science	A1N, Second cycle, has only first-cycle course/s as entry requirements
Environmental Health	A1N, Second cycle, has only first-cycle course/s as entry requirements

## Learning outcomes

The aim of the course is that the student should master the basics in chemical analysis, plant bioaccumulation, and statistical methods required to independently plan and carry out an environmental impact assessment (EIA) in a professional way.

#### Knowledge and understanding

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

• give an account of a selection of scientific methods and applied working

methodology in environmental work

- independently describe theoretical models for environmental impact assessments
- in detail reproduce an environmental impact assessment, including mapping of environmentally damaging activities, fields and contaminants.

#### Competence and skills

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

- carry out statistical analyses of data and understand how different statistical models describe reality
- report, communicate, present and discuss descriptions and analyses of environmental problems in dialogue with different target groups, both orally and in writing
- demonstrate proficiency required to participate in research and developmental work, or to work independently in other qualified profession.

#### Judgement and approach

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

- with professional skill evaluate and suggest basic methods for collection and quality assurance of environmental measurement data
- independently perform assessments of environmentally damaging activities, fields and contaminants, with respect to relevant scientific, societal and ethical aspects
- critically identify her/his need of additional knowledge and take responsibility for her/his knowledge development.

## Course content

Throughout the course, students work in groups on a project to produce a comprehensive environmental impact assessment (EIA). Specialisation occurs in two fields; chemical analysis and plant bioaccumulation. These two fields contain a theoretical part, including basic concepts and theories, and a practical part. Within each field, relevant statistical methods are presented and applied. The course includes:

- basic statistics and quality assurance of measurement data
- collection and processing of samples, and experimental design
- standard methods and accreditation
- cleaning of environmental residues
- below-ground transport of environmentally hazardous substances and plant bioaccumulation
- analysis of organic contaminants and metals in samples.

## Course design

The teaching consists of lectures, group assignments, exercises, laboratory sessions and a project work. Participation in group assignments, exercises, laboratory sessions, the project work and associated elements is compulsory.

#### Assessment

The examination consists of a written examination at the end of the course as well as the following compulsory components: a literature study, a project work, statistics exercises, written assignments in chemical analysis, and a laboratory session in plant bioaccumulation.

Students who do not pass a regular assessment will be offered another opportunity for assessment soon thereafter.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

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 written examination and approved compulsory activities are required.

The grading scale on the written examination is Fail, Pass, Pass with distinction, while the grading scale on the practical activities are Fail, Pass.

The final grade is determined by the combined assessment of the results on the written examination and other compulsory activities.

# Entry requirements

To be admitted to the course 90 credits in natural science studies are required, including knowledge equivalent to MVEA10 Environmental Science: Basic Course 15 credits and MVEC18 Law in Environmental Studies 15 credits.

## Further information

The course may not be included in a degree together with MVEN03 Environmental Science: Methodology in Environmental Science 15 credits.

The course is is offered at the Centre for Environmental and Climate Science, Lund university.

#### Subcourses in MVEN13, Environmental Science: Analysis and Methodology

Applies from H21

2101 Written exam, 7,5 hp Grading scale: Fail, Pass, Pass with distinction
2102 Practical work, 7,5 hp Grading scale: Fail, Pass The activities consist of a literature study, a project work, statistics exercises, written assignments in chemical analysis and a laboratory session in plant bioaccumulation