

# Syllabus

for course at advanced level

**Environmental Organic Chemistry and Modeling**  
**Organisk miljökemi och modellering**

**15.0 Higher Education  
Credits**  
**15.0 ECTS credits**

<b>Course code:</b>	MI7017
<b>Valid from:</b>	Autumn 2019
<b>Date of approval:</b>	2018-08-20
<b>Department</b>	Department of Environmental Science
<b>Main field:</b>	Environmental Science
<b>Specialisation:</b>	A1N - Second cycle, has only first-cycle course/s as entry requirements

## Decision

### Prerequisites and special admittance requirements

The equivalent to at least 120 ECTS in the natural sciences including at least 30 ECTS in Chemistry. A good command of the English language.

### Course structure

Examination code	Name	Higher Education Credits
HELA	Environmental Organic Chemistry	15

### Course content

a. The course explores different modeling concepts to investigate how physicochemical properties and environmental factors affect contaminant transport and fate in the environment, bioaccumulation of contaminants in food webs and human exposure to contaminants.

The knowledge is useful in research within environmental chemistry and (eco)toxicology, risk analysis, environmental consultancy, chemical regulation and chemical stewardship in industry.

Topics covered include:

- \* Physicochemical properties of organic contaminants
- \* Partitioning of organic contaminants between air, water, soil, sediment and biota
- \* Transport processes and reactions of organic contaminants in the environment
- \* Basic modeling concepts and application of multimedia environmental models to contaminants
- \* Modeling bioaccumulation of contaminants
- \* Modeling pathways of human exposure to contaminants
- \* Application of models in regulatory work

### Learning outcomes

Upon completion of the course, students are expected to be able to:

- \* account for the distribution of OMFs between air, water, soil, sediment and biota
- \* account for transport, dispersion and reactions of OMF in the environment
- \* develop and use mechanistic models to predict the dispersion and distribution of environmental pollutants

and how organisms are exposed

- \* identify and qualitatively understand the differences in the behaviour of different chemical classes in the environment and to analyse the different models needed because of these differences
- \* critically assess the utility of various models in environmental chemistry

### **Education**

Instruction consists of lectures, seminars, exercises and modelling workshops. Participation in seminars, exercises and modelling workshops and any associated integrated instruction is compulsory. In the event of special circumstances, the examiner may, after consultation with the teacher concerned, grant a student exemption from the obligation to participate in certain compulsory instruction.

### **Forms of examination**

a. The course is examined as follows: Knowledge assessment takes the form of oral and written assignments and a written exam.

b. Grades will be set according to a seven-point scale related to the learning objectives of the course:

A = Excellent

B = Very good

C = Good

D = Satisfactory

E = Adequate

Fx = Fail, some additional work required

F = Fail, much additional work required

c. The grading criteria will be distributed at the beginning of the course.

d. In order to pass the course, students must receive a passing grade, and participate in all mandatory instruction.

e. Standard wording: Students who receive a failing grade on a regular examination are allowed to retake the examination as long as the course is still provided. The number of examination opportunities is not limited. Other mandatory course elements are equated with examinations. A student who has received a passing grade on an examination may not retake the examination to attain a higher grade. A student who has failed the same examination twice is entitled to have another examiner appointed, unless there are special reasons to the contrary. Such requests should be made to the department board.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

### **Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two year period after course instruction has ended. Requests must be made to the departmental board. The provision also applies in the case of revisions to the course plan (and the revisions of the course literature).

### **Limitations**

The course may not be included in examinations in combination with courses Modelling of Environmental Pollutants I: Partitioning, Transport, and Exposure (MI8007), Modelling of Environmental Pollutants II: Applications (MI8008), or equivalent.

### **Misc**

The course is part of Mater's programme in Environmental Science focussing on Environmental Chemistry and Toxicology but can also be read as a separate course.

### **Required reading**

The course literature is decided by the department board and published on the Department of Environmental Science and Analytical Chemistry's website at least two months before the start of the course.