

# Syllabus

for course at advanced level

**Applied Environmental Modelling**  
**Tillämpad modellering för miljöanalys**

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

|                          |   |
|--------------------------|---|
| <b>Course code:</b>      | GE7022  |
| <b>Valid from:</b>       | Autumn 2012   |
| <b>Date of approval:</b> | 2006-09-27  |
| <b>Changed:</b>          | 2012-05-21  |
| <b>Department</b>        | Department of Physical Geography  |
| <b>Main field:</b>       | Environmental Management and Physical Planning                          |
| <b>Specialisation:</b>   | A1N - Second cycle, has only first-cycle course/s as entry requirements |

## Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University 2006-09-27 and revised 2010-05-17 and 2012-05-21.

## Prerequisites and special admittance requirements

Admission to the course requires knowledge equivalent to at least 90 ECTS credits in Earth sciences, geography, biology-earth sciences, biology, environmental sciences, or equivalent science or civil engineering competence is required. Also required is knowledge equivalent to Swedish upper secondary school course English B/English 6.

## Course structure

| Examination code | Name   | Higher Education Credits |
|------------------|--|--------------------------|
| 1MOM             | Theory for Environmental Systems Thinking and  | 7.5                      |
| 2MOM             | Practical Systems Analysis and System Dynamics | 7.5                      |

## Course content

a. The course covers problem solution using conceptual modelling, data collection and quantitative methods, error and risk analysis.

b. The course comprises the following elements:

1. Theory for Environmental Systems Thinking and Modelling 7.5 credits

The component covers data acquisition, data handling and analysis, with a focus on environmental resource monitoring, based on field data, aerial photographs, remote sensing and geographical information systems (GIS)

2. Practical Systems Analysis and System Dynamics 7.5 credits

The component covers systems analysis, conceptual modelling aggregated and distributed modelling scenario techniques, the handling of facts and values in practical exercises

## Learning outcomes

After the course, students are expected to:

- utilize system theoretical methods to conduct diagnostic and prognostic analyses of diverse environmental

problems, including identification of sub-systems, processes, delays and non-linear behaviour

- apply conceptual modelling on practical examples
- use aggregated computer-based modelling
- apply scenario techniques, analyse and evaluate scenario assumptions and results
- analyse uncertainty, knowledge and values when assessing risks.

### **Education**

The education consists of lectures, seminars, exercises and project work.

Participation in the seminars, exercises and project work and education associated with this is compulsory. An examiner may rule that a student is not obliged to participate in certain compulsory education if there are special grounds for this after consultation with the relevant teacher.

Instructions are in English.

### **Forms of examination**

a. The course is examined as follows: Knowledge assessment takes the form of:

- Written and oral examination
- Written and oral presentations of project work.

Examination is in English.

b. Grading is carried out according to a 7-point scale related to learning objectives:

A = Excellent  
B = Very Good  
C = Good  
D = Satisfactory  
E = Sufficient  
Fx = Fail  
F = Fail

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

d. To be awarded a pass, the minimum grade E is required and

- participate in all mandatory instruction
- pass of all rapport from exercises

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term “examination” here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

f. There is no facility to improve the grade Fx to a pass grade in this course.

### **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.

### **Misc**

The course is part of the Master programmes in Environmental Management and Physical Planning, Environmental Analysis and Management and Environment Health and Protection, but can also be taken as independent course.

### **Required reading**

Course literature is decided by the departmental board and described thereafter in an appendix to the course plan.