

# Programme syllabus

## Soil, Water and Environment - Master's Programme

*Mark, vatten och miljö - masterprogram*

120.0 hp

Programme code: NM029

Finalized by: Utbildningsnämnden, 2017-10-11

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### Programme board

The programme board for education in natural resources and agriculture

### SLU ID

SLU.ua.2025.3.1.1-113

### Revised

2025-01-22

### Revised by

The programme board for education in natural resources and agriculture

### Entry requirements

Admission to the Master's programme Soil, Water and Environment requires a first-cycle qualification comprising 180 credits and including specialised studies comprising 90 credits within one of the following subjects/disciplinary domains:

- biology
- agricultural sciences

- soil sciences, geo sciences
- environmental sciences
- forestry
- technology

In addition, knowledge corresponding to

- at least 15 credits within chemistry
- at least 15 credits within biology and/or soil or earth sciences.

Applicants with the equivalent qualifications obtained by means of a degree from another country, or with the equivalent knowledge obtained in some other way, may also be regarded as fulfilling the specific entry requirements.

This programme is taught in English. The applicant must further have a level of English equivalent to upper secondary school English, called English 6. An applicant with a first-cycle qualification from SLU comprising 180 credits automatically fulfils this requirement. Special rules apply for applicants with qualifications from one of the Nordic countries and some English-speaking countries.

Specific requirements apply for admission to the individual courses included in the programme.

## **Objectives**

### **General objectives**

The general objectives for first- and second-cycle courses and programmes are specified in the Swedish Higher Education Act (Chapter 1, Sections 8–9).

### **Objectives for a Degree**

In accordance with the annex to the Ordinance for the Swedish University of Agricultural Sciences, for a degree of Master (120 credits) the student shall:

#### *Knowledge and understanding*

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

*Competence and skills*

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work
- demonstrate the ability in speech and writing both nationally and internationally to clearly report and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

*Judgement and approach*

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

**Degree****Degree awarded on completion of the programme**

Upon completion of the programme, the degree of Master of Science is awarded. Other general qualifications may be awarded, provided that the requirements for them are fulfilled. More information can be found in SLU's degree regulations.

Students who fulfil the qualification requirements for a degree will be issued a degree certificate upon request. The degree certificate will specify the qualification as Degree of Master of Science (120 credits) with a Major in Soil Science or with a Major in Environmental Science.

**Degree requirements**

A **degree of Master of Science (120 credits)** with a **major in soil science** is awarded to students who fulfil the course requirements (courses with a Pass grade) of 120 credits, of which at least 90 credits at second-cycle level, according to the following:

- at least 30 credits of courses with specialised study in the main field soil science (A1N; A1F),
- at least 30 credits from an independent project (degree project) in the main field soil science (A2E).

In addition, the student must hold a degree of Bachelor or professional qualification of at least 180 credits or an equivalent qualification.

A **degree of Master of Science (120 credits)** with a **major in environmental science** as the main field of study is awarded to students who fulfil the course requirements (courses with a Pass grade) of 120 credits, of which at least 90 credits at second-cycle level, according to the following:

- at least 30 credits of courses with specialised study in the main field environmental science (A1N; A1F),
- at least 30 credits from an independent project (degree project) in the main field environmental science (A2E).

In addition, the student must hold a degree of Bachelor or professional qualification of at least 180 credits or an equivalent qualification.

## **Content**

### **Programme description**

The Soil, Water and Environment programme provides the student with advanced knowledge in soil and water management. The programme combines this with applied knowledge within the study field, scientific training and connections to the related sector for soil and water management.

The programme provides a comprehensive description of processes in soil and water seen from a landscape perspective. The programme emphasises important soil properties and important flow paths for water, nutrients and other substances through the soil and the plants to the atmosphere, or through the soil to ground and surface water. Students will be trained in the ability to assess the effects of various types of soil use on soil and water quality, and to design and apply relevant management methods. The studies are facilitated if the student has basic knowledge of one of the subjects ecology, geology, natural geology, hydrology or soil science.

The programme covers in-depth elements in soil science and applied elements in sustainable soil and water use. Some courses focus on international aspects of soil and water management. The second year includes a placement to give the students experience of the

labour market in related organisations, research institutes and companies. The studies conclude with an independent project (degree project), where the student can implement their knowledge, abilities and attitudes on a current issue within the subject area of sustainable soil and water use.

Scientific approach and scientific methods are trained by using SLU research in lectures and supervision. Training of generic competences is integrated in courses and in independent degree projects. Communication skills are trained throughout the programme in dialogue with different audiences. The ability to critically and systematically integrate knowledge is trained in complex questions relating to sustainable use of soil and water in projects and exercises in courses and degree projects.

### **Courses in the programme**

Main fields of study MV=Soil science, MX=Environmental science, BI=Biology, TN=Technology, ÖT=other subject

#### **Year 1**

Soil water processes in agroecosystems, 15 hp, MV/MX, A1N

Environmental geochemistry, 15 hp, MV/MX, A1N

Soil and water chemistry, 7,5 hp, MV/MX, A1N

Geographic information systems, for environmental and natural science studies, 7,5 hp, TN, A1N

Soil biology and biogeochemical cycles, 15 hp, MV/BI, A1N

Environmental assessment, 15 hp, MX, A1N

#### **Year 2**

Soils of the world and sustainable water and soil management, 15 hp, MV, A1N

Sustainable technologies for agriculture in low- and medium income countries, 7,5 hp, TN/MX, A1N

Land use and watershed management to reduce eutrophication, 7,5 hp, MV/MX, A1N

Safe nutrient recycling, 15 hp, MX/BI, A1N

Models for sustainable water management, 7,5 hp, MX, A1N

Research internship, 15 hp, MV/MX, A1F

Qualified work placement 2, 15 hp, ÖT, AXX

Master thesis in environmental science, 30 hp, MX, A2E

Master thesis in environmental science, 60 hp, MX, A2E

Master thesis in soil science, 30 hp, MV, A2E

Master thesis in soil science, 60 hp, MV, A2E

The courses offered may change during the course of the programme. Decisions on the courses offered are taken well in advance of the next academic year.

For each course, there is a course syllabus providing more detailed course information. Information on when courses are offered is available on the SLU student web.

## **Additional information about the programme**

### **General regulations for first- and second-cycle courses and programmes**

For more information on semester dates, examination and credit transfer, see the Regulations for education at Bachelor's and Master's level available on the SLU student web.

### **Possibilities for further studies**

Students who complete the programme and are awarded a degree of Master have the option to continue their studies at doctoral level.