



Faculty of Science

## NAASK, Master Programme in Atmospheric Sciences and Biogeochemical Cycles, 120 credits

*Masterprogram i atmosfärvetenskap och biokemiska kretslopp, 120 högskolepoäng*

**Second cycle degree programme requiring previous university study / *Program med akademiska förkunskapskrav och med slutlig examen på avancerad nivå***

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### Decision

The programme syllabus is established by Study programmes board, Faculty of Science 24-10-2007 (N 2007-43) and most recently amended by The Board of Faculty of Science 13-06-2018 (U 2018/235). The amended syllabus is valid from 15-09-2018, autumn semester 2019.

### Programme description

The programme for a degree of Master of Science specialising in Atmospheric Sciences and Biogeochemical Cycles comprises 120 credits and leads to a degree of Master of Science (120 credits) with a major in Atmospheric Sciences and Biogeochemical Cycles.

The programme is based on scholarship and is closely linked to research conducted at the Lund University Faculty of Science. The operations at the faculty uphold academic credibility and good research practice and are arranged to ensure that high standards are attained in courses and study programmes. Furthermore, the operations promote sustainable development, equality between women and men and understanding of other countries and international circumstances. These aspects are integrated in the degree outcomes of the programme.

Second-cycle courses and study programmes in the main field of Atmospheric Sciences and Biogeochemical Cycles are fundamentally based on the knowledge acquired by students during first-cycle courses and study programmes.

Second-cycle courses and study programmes in the main field of Atmospheric Sciences and Biogeochemical Cycles involve the acquisition of specialist knowledge, competence and skills in relation to first-cycle courses and study programmes, and in addition to the requirements for first-cycle courses and study programmes shall:

- further develop the ability of students to integrate and make autonomous use of their knowledge,
- develop the students' ability to deal with complex phenomena, issues and situations, and
- develop the students' potential for professional activities that demand considerable autonomy, or for research and development work.

The programme applies a learning perspective, in which students take an active role in the learning process, and consciously and continuously reflect on their learning and development towards the degree outcomes.

The appendix Achievement of learning outcomes for a degree of Master of Science with a major in Atmospheric Sciences and Biogeochemical Cycles at the Faculty of Science describes the disciplinary foundation and links to research of the programme.

## Goals

Based on the learning outcomes stated in Higher Education Ordinance 1993:100 (with later amendments) annex 2, for a degree of Master of Science in Atmospheric Sciences and Biogeochemical Cycles, students shall have acquired in-depth knowledge and understanding of

- processes in Aerosol Physics and Atmospheric Physics
- processes in Micrometeorology
- the biogeochemical cycles of carbon and other greenhouse gases,
- processes that control the condition and flow of mass and energy in the ground-vegetation-atmosphere system, particularly in the interaction between the surface of the earth and the atmosphere,
- computer, field and laboratory based methods for the analysis of atmospheric and biogeospheric processes
- working in a scientific context,
- knowledge of and insight into issues of equality and diversity in science and in the global community.

Additionally, students shall have acquired the ability to

- integrate knowledge for analysing and solving new and unknown problems within the area of climate change, on the basis of the scientific context of the atmosphere and biosphere,
- assimilate summarised and synthesised information from different sources,
- structure and compile information and empirical material,
- evaluate information from different sources,
- design and plan research, development and investigative activities,
- assess societal measures for managing the problems caused by climate change,
- design hypotheses and scenarios based on complex information,
- use and assess relevant spatial and temporal scales when analysing different processes and relationships,
- choose and apply pertinent methods for analysing different processes and relationships,

- assess, reflect on and critically review literature within the subject field,
- present conclusions, including the underlying knowledge and logical grounds for these conclusions, to subject specialists and laymen,
- disseminate knowledge in an advanced, structured and logical manner,
- produce written material and carry out high quality oral presentations,
- hold a dialogue with subject specialists and laymen,
- use their skills and knowledge in different forms of teamwork, and to have understanding and respect for different opinions and points of view,
- make assessments with regard to the relevant scientific, societal and ethical aspects, as well as demonstrating awareness of the ethical aspects of research and development work,
- study and work in a self-supervised and independent manner,
- search for information, both nationally and internationally.

### **Knowledge and understanding**

For a Degree of Master (120 credits) the student shall

- 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**

For a Degree of Master (120 credits) the student shall

- 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**

For a Degree of Master (120 credits) the student shall

- 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.

*Independent project (degree project)*

A requirement for the award of a degree of Master (120 credits) is completion by the student of an independent project (degree project) for at least 30 credits in the main field of study. The degree project may comprise less than 30 credits, however no less than 15 credits, if the student has already completed an independent project in the second cycle for at least 15 credits in the main field of study or the equivalent from a programme of study outside Sweden.

## Course information

The programme comprises 2 years for a degree of Master (120 credits) including 90 credits in Atmospheric Sciences and Biogeochemical Cycles. The appendix Achievement of learning outcomes for a degree of Master of Science with a major in Atmospheric Sciences and Biogeochemical Cycles at the Faculty of Science describes the courses included.

## Degree

Degree titles

Degree of Master of Science (120 credits)

Major: Atmospheric Sciences and Biogeochemical Cycles

*Naturvetenskaplig masterexamen*

*Huvudområde: Atmosfärvetenskap och biogeokemiska kretslopp*

## Requirements and Selection method

### Requirements

Degree of Bachelor of Science amounting to at least 180 credits in physical geography, physics or the equivalent.

Proficiency in English equivalent to English 6/B from Swedish upper-secondary school.

### Selection method

Based on previous university/college studies and other merits such as letters of recommendation and statement of purpose

## Transition rules

The Faculty Board may decide on the discontinuation of a programme or major and may also decide, in association with this, on transitional provisions for students who have started these degree programmes.

## Other information

Rules pertaining to grades and examination are stated in the course syllabi approved by the Faculty Board.