



Faculty of Science

## NABER, Master Programme in Computational Science, 120 credits

*Masterprogram i beräkningsvetenskap, 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 The Board of Faculty of Science 28-09-2022 (U 2022/610) to be valid from 28-09-2022, autumn semester 2023.

### Specialisations

Code	Swedish name	English name	Credits
BEGE	Geoscience	Geovetenskap	120 credits
BEFY	Physics	Fysik	120 credits
BEMA	Scientific Computing	Beräkningsmatematik	120 credits

### Programme description

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

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 Computational

Science 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 Computational Science 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 Computational Science at the Faculty of Science describes the disciplinary foundation and links to research of the programme.

## Goals

### 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). The appendix Achievement of learning outcomes for a degree of Master of Science with a major in Computational Science at the Faculty of Science describes the courses included.

## **Degree**

Degree titles

Degree of Master of Science (120 credits)

Major: Computational Science

Major: Computational Science with specialization in Geoscience

Major: Computational Science with specialization in Physics

Major: Computational Science with specialization in Scientific Computing

*Naturvetenskaplig masterexamen*

*Huvudområde: Beräkningsvetenskap*

*Huvudområde: Beräkningsvetenskap med fördjupning i beräkningsmatematik*

*Huvudområde: Beräkningsvetenskap med fördjupning i fysik*

*Huvudområde: Beräkningsvetenskap med fördjupning i geovetenskap*

## **Requirements and Selection method**

### **Requirements**

#### **Specialisation in Physics**

Bachelor's degree in Physics of at least 180 credits.

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

*or*

Bachelor's degree of at least 180 credits in Science or Engineering. The degree should contain at least 30 credits mathematics, of which 6 credits in programming and 7.5

credits in statistics, and an additional 90 credits in mathematics and/or physics.

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

### **Specialisation in Geoscience**

Bachelor's degree in Physics of at least 180 credits. The degree must contain at least 15 credits in geoscience.

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

*or*

Bachelor's degree of at least 180 credits in Science or Engineering. The degree must contain at least 30 credits mathematics, of which 6 credits in programming and 7,5 credits in statistics, and an additional 60 credits in mathematics and/or physics. The degree must contain at least 15 credits in geoscience.

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

### **Specialisation in Scientific Computing**

Bachelor's degree in Physics of at least 180 credits.

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

*or*

Bachelor's degree of at least 180 credits in Science or Engineering. The degree must contain at least 30 credits mathematics, of which 6 credits in programming and 7.5 credits in statistics, and an additional 60 credits in mathematics and/or physics. The degree must contain at least 15 credits in a natural science (not mathematics) or in computer science.

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

### **Other information**

Some of the optional courses within the program may have higher requirements in mathematics or in other natural science subjects.

### **Selection method**

Seats are allocated according to: ECTS (HPAV): 100 %.

### **Other information**

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