UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

PROGRAMME SYLLABUS

Molecular Ecology – Master's Programme

120 credits

Programme code: MOLEA
Version number: 4
Valid from: 1 July 2026
Ratified by: Curriculum Committee for Bioscience
Date of ratification: 28 August 2025

1. General information about the study programme

The study programme is provided by the University of Skövde and is named Molecular Ecology – Master's Programme (Molekylär ekologi – masterprogram). It comprises 120 credits and is a second-cycle programme. The main field of study is Systems Biology.

2. Entry requirements

A Bachelor's degree equivalent to a Swedish kandidatexamen of 180 credits, with a major in the biological area (or the equivalent). The biological area can be defined as e.g. Ecology, Molecular Biology, Biochemistry, Microbiology, Physiology or Bioinformatics.

A further requirement is proof of skills in English equivalent of studies at upper secondary level in Sweden, known as the Swedish course English 6 or English level 2. This is normally demonstrated by means of an internationally recognized language test, e.g. IELTS or TOEFL.

The entry requirements above are applicable for admission to the study programme. For further studies within the programme, the entry requirements for each course must be met. These entry requirements are specified in each separate course syllabus.

3. Study programme content

Semester 1 mainly focuses on providing the students with in-depth scientific and laboratory knowledge in molecular biology and areas that contribute necessary methods for studies in molecular ecology. The student learns to plan and perform laboratory experiments and to interpret and analyse the generated data. The course “Molecular ecology in conservation” introduces the student to current research specialisations, theories, applications and scientific methods within molecular ecology

During the second semester the student’s ability to analyse and interpret experimental biological data with methods in bioinformatics and systems biology is further developed. The students also study the course “Applied molecular ecology” in which they further develop their practical and theoretical knowledge within molecular ecology.

During the first part of the third semester the students learn to generate and analyse sequencing data. During the second part of the third semester and throughout the fourth semester the students perform a master degree thesis project.

The following courses are included in the programme:

Bioinformatics Analysis with R A1N, 7.5 credits

Data Analysis for Life Science A1N, 5 credits

Experimental Methods and Design in Life Science A1N, 17.5 credits

Molecular Ecology in Conservation Biology A1N, 7.5 credits

Analysis of Sequencing Data A1F, 7.5 credits

Applied Molecular Ecology A1F, 7.5 hp

Library Preparation and Sequencing Technologies A1F, 7.5 credits

Multivariate Biological Analysis with R A1F, 7.5 credits

Systems Biology A1F, 7.5 credits

Master Degree Project in Systems Biology A2E, 45 credits

4. General objectives

Objectives for education at the second-cycle level in The Higher Education Act

Second-cycle courses and study programmes shall 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.

5. Study programme objectives

Objectives for Master's Degree according to the Higher Education Ordinance

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.

Local objectives for the study programme at the University of Skövde

After completion of the programme the student shall

- show in depth knowledge of applications and practical knowledge within molecular ecology using methods in molecular biology, ecology, systems biology and bioinformatics, and
- within the specialisation of the programme demonstrate knowledge of how digitization can be used to promote sustainable development.

6. Language of instruction

The teaching is conducted in English.

7. Degree qualification

A student who passes the courses in the programme fulfills the requirements for obtaining a Degree of Master of Science (120 credits) with a major in Systems Biology.

Degree certificates are issued after application. Information about how to submit an application can be found on the website of the University of Skövde.

8. Changes to the programme syllabus

The programme syllabus and its courses may be changed, within the framework of the objectives for the study programme.

9. Student influence

Student influence in the study programme is ensured by means of programme evaluations. The students are informed about the results of the evaluations and potential measures that have been taken or are planned, based on the course evaluations.

10. Additional information

Further information about the study programme, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.