UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

PROGRAMME SYLLABUS

Biomarkers in Molecular Medicine - Master's Programme

120 credits

Programme code: BIOMA
Version number: 11
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 Biomarkers in Molecular Medicine - Master's Programme (Biomarkörer inom molekylär medicin - masterprogram). It comprises 120 credits and is a second-cycle programme. The main field of study is Systems Biology.

2. Entry requirements

To be eligible for the program a Bachelor's Degree (equivalent to a Swedish Bachelor's Degree) with a major in the biological or medical area is required. The biological area can be defined as e.g. Molecular Biology, Biochemistry, Microbiology or Physiology. The medical area is here defined as Biomedicine but can also include subjects like Pharmacology.

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

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

Initially, the training focus on providing the students with detailed laboratory skills.The students also learn to plan laboratory experiments as well as interpret and analyse the data that is generated. In addition, the students also get an insight into the concepts and practises about the use of biomarkers in molecular medicine.

Furthermore, the students learn additional methods for analysing experimental biological data, and to identify, verify and validate biomarkers in molecular medicine, as well as to generate and analyse sequencing data.

The programme ends with a Master Degree Project, during which the acquired knowledge is used to independently solve a research problem within Systems Biology.

The following courses are included in the programme:

Bioinformatics Analysis with R A1N, 7.5 credits

Biomarkers in Molecular Medicine A1N, 7.5 credits

Data Analysis for Life Science A1N, 5 credits

Experimental Methods and Design in Life Science A1N, 17.5 credits

Analysis of Sequencing Data A1F, 7.5 credits

Biomarkers – Data Analysis A1F, 7.5 credits

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 Master's Degree students shall be able to

- show knowledge and understanding within the main area of the education, inclusive of wide knowledge within the area, a considerable in depth knowledge within certain parts of the area as well as deeper insight into current research and development,
- show in depth knowledge of methodology within the main area of the education.

Proficiency and Ability
For a Master's Degree the students shall be able to

- show the ability to critically and systematically integrate knowledge and analyse, assess and manage complex phenomena, questions and situations even with limited information,
- show the ability to critically independently and creatively identify and formulate questions, as well as to plan and, with adequate methods, carry out advanced assignments within specified time limits and thereby contribute to the development of knowledge as well as to evaluate these efforts,
- show the ability in both national and international contexts to, orally and in writing, clearly account for and discuss their conclusions and the knowledge and arguments these are based on in dialogue with different groups, and
- show the proficiency required to participate in research and development in other advanced activity.

Ability to Evaluate and Relate
For the Master's Degree students shall

- show the ability, within the main area of the education, to make assessments in accordance with relevant research, societal and ethical aspects as well as show awareness of ethical aspects in research and development,
- show insight into the possibilities and limitations of research, its role in society and human beings' responsibility for how it is used, and
- show the ability to identify the need for further knowledge and to take responsibility for the development of their knowledge.

Local objectives for the study programme at the University of Skövde

Students shall

- after completion of the programme show deeper knowledge to applications and underlying theories to identify, verify and validate biomarkers in Molecular Medicine by the use of Systems Biology methods, and
- within the specialization of the programme demonstrate in depth 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.