Reg. no HNT 2024/55
Approved 1 February 2024

Programme Syllabus

Master's Programme in Ecology and Conservation Biology

Programme Code:	NABIM
Programme Title:	Master's Programme in Ecology and Conservation Biology *Masterprogram i biologi: ekologi och naturvård*
Credits:	120
Programme Approval:	The programme syllabus was approved by the Faculty Board of Health, Science and Technology on 1 February 2024, effective from the autumn semester of 2024.
Language of Instruction:	Swedish and English
Education Cycle:	Second (Master's)
Degree Type:	General
Degree Title:	Master of Science (120 credits). Main field of study: Biology. It is also possible to obtain a Degree of Master (60 credits) following successful completion of course requirements worth 60 credits, of which at least 30 credits must be at Master's level, including a degree project in Biology comprising 15 credits. Master of Science (60 credits). Main field of study: Biology.
Entry Requirements:	General entry requirements. A bachelor-level degree of at least 180 credits, specialising in the main field of study Biology. Upper secondary school level English 6 or equivalent.

General information

According to the UN Millennium Ecosystem Assessment, habitat loss is increasing and the world's biodiversity is decreasing dramatically. Therefore, one of the biggest challenges today is to preserve the ecosystem services that nature provides us with, such as natural resources and biodiversity.

The Master's programme in Ecology and Conservation Biology provides specialised knowledge of how humans affect various terrestrial and aquatic ecosystems and what measures can be taken to preserve biodiversity and valuable habitats.

Programme outcomes

The Higher Education Ordinance, System of Qualifications, specifies the outcomes required for certain degrees. The outcomes for a Degree of Master of Science (60/120 credits) are as follows:

Second-cycle courses and study programmes shall be based fundamentally on the knowledge acquired by students in first-cycle courses and study programmes, or its equivalent.

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.

(Chap. 1 Sect. 9, Higher Education Act, SFS 1992:1434)

The Higher Education Ordinance, System of Qualifications, specifies the outcomes required for a certain degree (SFS 1993:100). Specific requirements determined by each higher education institution within the parameters of the requirements laid down in this qualification descriptor shall also apply for a Degree of Master (120 credits) with a defined specialisation.

National outcomes for second cycle studies - Degree of Master (60 credits)

Knowledge and understanding

For a Degree of Master (60 credits) the student shall

- demonstrate knowledge and understanding in the main field of study, including both an overview of the field and 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 (60 credits) the student shall

- demonstrate the ability to 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 autonomously as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames
- demonstrate the ability in speech and writing to report clearly 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 employment in some other qualified capacity.

Judgement and approach

For a Degree of Master (60 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 outcomes for a Degree of Master (60 credits) within the framework of the Master's Programme in Ecology and Conservation Biology at Karlstad University

In addition to the national outcomes for a Degree of Master (60 credits), the following outcomes apply:

For a Degree of Master (60 credits) the student shall

- demonstrate specialised knowledge and understanding of various theoretical explanatory models of ecosystems, the abiotic and biotic interactions between them, and be able to integrate this knowledge to assess complex ecological problems
- demonstrate understanding and specialised knowledge of how humans, through their various activities, affect different ecosystems and ecosystem services
- demonstrate understanding of a scientific and critical approach in relation to the possibilities and limitations of science in terms of research methods applied to terrestrial and aquatic ecosystems
- demonstrate the ability to verbally and in writing communicate theories and ecological problems and research findings with experts and non-experts in matters that are within the scope of the programme curriculum

National outcomes for a Degree of Master (120 credits)

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 deepened 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 to clearly present and discuss their conclusions in speech and writing in dialogue with different audiences in both national and international contexts, 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.

Local outcomes for a Degree of Master (120 credits) within the scope of the Master's Programme in Ecology and Conservation Biology

In addition to the national outcomes for a Degree of Master (120 credits), the following outcomes apply:

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

- demonstrate a considerable degree of specialised knowledge and understanding of various theoretical explanatory models of ecosystems, the abiotic and biotic interactions between them, and be able to integrate this knowledge to assess complex ecological problems
- demonstrate understanding and specialised knowledge of how humans, through their various activities, affect different ecosystems and ecosystem services at local, regional and global levels
- demonstrate the ability to autonomously plan, use and evaluate the results of commonly used quantitative and qualitative sampling and analysis methods and to compile these in speech and in writing
- demonstrate specialised insight into research and development work in ecology and conservation biology
- demonstrate specialised understanding of a scientific and critical approach in relation to the possibilities and limitations of science in terms of research methods as well as experimental methods applied to terrestrial and aquatic ecosystems
- demonstrate the ability to verbally and in writing present, communicate, discuss and give arguments for theories and complex ecological problems and research findings with experts and non-experts in matters that are within the scope of the programme curriculum.

The programme stipulates that the degree project for a Degree of Master (120 credits) must be a cohesive degree project comprising 30 or 60 credits. This means that a previously completed degree project at Master's level comprising 15 credits in biology cannot contribute to the degree project for a Degree of Master (120 credits).

Programme structure

The programme comprises four semesters. The first two semesters consist of courses in the profile areas ecology and conservation biology. These courses are usually led by researchers from the research team. The third semester consists of optional courses with the opportunity to study abroad. It is also possible to specialise further in ecology and conservation biology by choosing a Master's thesis course comprising 60 credits. The degree project is preferably completed in collaboration with a company, government agency or the research team in ecology and conservation biology.

Internationalisation

Karlstad University wants to promote collaboration and exchange with other universities. Karlstad University has partnerships with many other universities in Sweden and abroad, and has an organisation in place to support students who want to make use of this opportunity. Students are therefore encouraged to complete part of the programme at a university abroad.

Programme curriculum

The programme includes courses corresponding to 90 credits in the main field of biology with a specialisation in ecology and conservation biology. In addition, the programme also includes 30 credits in optional courses that can be studied at Karlstad University or another higher education institution.

The programme comprises studies in biology at Master's level with a specialisation in ecology and conservation biology. The programme is closely affiliated with the strong research environment in biology at Karlstad University.

Semester 1

Studies during semester 1 focus on a deepening and broadening of theoretical knowledge of ecology as well as specialised knowledge of how human activities affect ecosystems in general and in Sweden in particular.

The course Ecosystems in a changing world is a deepening and broadening of knowledge about the human impact on ecosystems, ecosystem resilience, as well as ecosystem services and their relationship to the development of human society. The course provides training in critically examining the effects that the human lifestyle can have on ecosystems and ecosystem services from a science perspective. One aspect is how a warmer climate will affect ecosystems through the adaptation, spread and extinction of species. The course includes study visits to illustrate conservation biology in different environments.

The course Conservation science for sustaining biodiversity provides specialised knowledge of how human activities affect ecological processes in terrestrial and aquatic ecosystems. The course looks at various measures that are used to ensure biological diversity, how to apply knowledge of ecology in practical conservation biology efforts and how these are integrated in decision-making processes. The course provides training in evaluating and critically analysing previous research and knowledge of legislation and decision-making processes in relation to nature conservation.

Courses included in the programme:

- Ecosystems in a changing world (15 credits)
- Conservation science for sustaining biodiversity (15 credits)

Semester 2

The second semester includes two courses with a specialisation in the research areas of landscape ecology and advanced methodology (focus on freshwater ecology).
The course Landscape ecology looks at how changes in the landscape affect ecosystems and the distribution of species, how the composition, structure and function of the landscape change and how humans manage landscapes. Landscape ecology with its focus on spatial patterns is important for various conservation issues, as the course highlights.

In the course Scientific methods in freshwater ecology includes different methods used in freshwater ecology, such as methods for sampling and fish tagging. Large parts of the course are directly affiliated with ongoing research projects in the research environment of biology.

Courses included in the programme:

- Landscape ecology (15 credits)
- Scientific methods in freshwater ecology (15 credits)

The programme comprises the following courses for a Degree of Master (60 credits): Master's thesis in biology (15 credits)

Semester 3 – optional semester

Studies during the third semester consist of optional courses equivalent to 30 credits. Students can choose to start the degree project by taking the Master's thesis course in biology 60 credits, which starts in semester 3 and ends in semester 4. The degree project (thesis) must be focused on ecology and conservation biology and can be conducted within one of the ongoing research projects in the research environment in biology or in collaboration with external actors.

The Master's thesis course in biology 60 credits comprises three modules, including writing a detailed project plan as well as experimental design, statistics and research ethics.

Course included:

Master's thesis in biology (60 credits)

Semester 4

During semester four, students write a Master's thesis in biology 30 credits, unless they choose to write a Master's thesis in biology 60 credits. The degree project (thesis) must be focused on ecology and conservation biology and can be conducted within one of the ongoing research projects in the research environment in biology or in collaboration with external actors.

Course included:

Master's thesis in biology (30 credits)

Credit transfer

Students have the right to transfer credits from previously completed university courses in Sweden or abroad, subject to approval according to the current regulations. Credit transfer is subject to approval according to the current regulations.

Additional information

The local regulations for first and second cycle education at Karlstad University stipulate the obligations and rights of students and staff.

This programme syllabus will replace the previous version approved on 25 February 2016 (HNT 2016/65).