Swedish University of Agricultural Sciences

Programme syllabus

Plant Biology for Sustainable Production - Master's Programme

Växtbiologi för hållbar produktion - masterprogram

120.0 hp

Programme code: LM011

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Programme board

The programme board for education in landscape and horticulture

SLU ID

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2022-12-07

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Entry requirements

To be admitted to the Master's programme Plant Biology for Sustainable Production, the following is required:

- general entry requirements: a first-cycle degree of 180 credits

- specific entry requirements: first-cycle specialisation in one of the following:

- 90 credits in the main field of study, biology, or

- 60 credits in biology and 30 credits in agricultural sciences, horticultural science, forest science or forestry science

The specific entry requirements above may also be met by having acquired equivalent knowledge through a foreign degree or some other means.

Admission also requires knowledge equivalent to the upper-secondary course English 6. By local decision of the Swedish University of Agricultural Sciences (SLU), this requirement is met by someone with a Degree of Bachelor of 180 credits awarded by a Swedish higher education institution or 120 credits for completed courses at SLU. English 6 may also be obtained in other ways, as specified at antagning.se/universityadmissions.se.

The specific entry requirements for admission to the courses included in the programme are stated in individual course syllabuses.

Objectives

General outcomes

The general objectives of first- and second-cycle courses and programmes are described in Sections 8 and 9 of Chapter 1 of the Swedish Higher Education Act (SFS 1992:1434).

Objectives for a Degree of Master

In accordance with the annex to the Ordinance for the Swedish University of Agricultural Sciences, for a Degree of Master, the following requirements apply:

Knowledge and understanding

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

demonstrated 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

demonstrated specialised methodological knowledge in the main field of study (biology).

Competence and skills

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

- demonstrated the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information;
- demonstrated the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake specialised tasks

within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work;
- demonstrated the ability in speech and writing both nationally and internationally 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
- demonstrated 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 have:

- demonstrated the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical considerations and also to demonstrate awareness of ethical aspects of research and development work;
- demonstrated insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used; and
- demonstrated the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Degree

Degree awarded upon successful completion of the programme

The Master's programme Plant Biology for Sustainable Production leads to the award of Degree of Master of Science in Biology, which is a general degree. Other degrees may be awarded provided that the qualification requirements are fulfilled. See SLU's local system of qualifications.

Students who fulfil the qualification requirements for a degree will be issued a degree certificate upon request. The degree certificate will specify the qualification as Master of Science in Biology (120 credits).

Degree requirements

A Degree of Master (120 credits) is awarded to students who have successfully completed the qualification requirements of 180 credits, with the following requirements:

a minimum of 30 credits from courses with specialisation within the main field of study, biology (A1N; A1F);

a minimum of 30 credits for an independent project in the main field of study, biology (Master's project/A2E).

A maximum of 30 credits from successfully completed first-cycle courses may be included.

In addition, the prior award of a Degree of Bachelor, Degree of Bachelor of Fine Arts, professional or vocational qualification of at least 180 credits, or a corresponding qualification from abroad, is required.

Content

Programme description

The purpose of the programme is to provide specialist knowledge of plant biology, especially its application for sustainable production within agriculture, horticulture or forestry. Plant biology is a central area within biology that covers many different aspects of plant life. Plant products are, for example, of great importance as food, animal feed, building materials, fibres and medicines. Knowledge about plants' functions, genetics and interactions with their surroundings is necessary for sustainable plant production and thus sustainable development.

The successful completion of the programme leads to a Degree of Master that provides the student with a point of entry to third-cycle studies or a career in the private or public sectors with a focus on future sustainable societal solutions. The programme begins with an introductory course that provides basic competence in the field of plant biology and molecular genetics as a foundation for future courses. As the programme is aimed at students from diverse backgrounds, it is vital that everyone has the necessary basic knowledge. The introductory course also provides general competence in areas such as literature management and sustainable development.

The following three courses during the first year provide the student with in-depth knowledge of importance to sustainable plant production and are part of a progressive specialisation in the subject. The elective specialist courses provide the student with the opportunity to deepen their knowledge within specific areas of plant biology, such as plant protection and breeding to meet the challenge of climate change, or the interaction between plants and the surrounding environment and how this is affected by abiotic and biotic factors.

The programme has two specialisations based on different campuses. The study route for each is described below. The specialisation is chosen on admission but there will be an opportunity to change specialisation after the first year. During the first year, the specialisations share the same basic courses, providing general competence and a solid foundation in plant biology for continued studies during the second year of the programme. These courses may be taken at Alnarp or Ultuna.

In year 2, students will pursue one of the following specialisations:

Plant Breeding and Protection, Alnarp

Abiotic and Biotic Interactions of Cultivated Plants, Ultuna

These specialisations complement one another and each is based on cutting-edge expertise within SLU. The student can choose to complete a Master's project for either 30 or 60 credits. It is also possible to take project-based advanced courses for 15 credits and a Master's project for either 30 or 60 credits at SLU in Umeå.

Students are expected to acquire knowledge of important research, development and methods concerning plants used in sustainable plant production so that they can work autonomously on related issues within agriculture and forestry, horticulture, industry, biotechnology and the environment. Among the skills taught in the programme is the ability to autonomously, critically and creatively identify and formulate issues related to plant life processes. All qualitative targets are covered during the first year in basic courses and the degree project.

The programme invites applications from Swedish and international students wishing to deepen their knowledge of plant biology. The programme is research-based with links to strong research environments, something that will prepare the student for third-cycle studies and an international academic career. The programme also opens professional doors to various land-based sectors, including companies working with plant breeding and protection.

Courses in the programme

Main field of study:

TD = Horticulture,

BI = Biology,

KE = Chemistry,

LB = Agricultural sciences

Year 1, Campus Alnarp or Campus Ultuna

Introduction to Plant Biology for Sustainable Production, 15 credits (BI, A1N);

Plant Growth and Development, 15 credits (BI, A1N);

Plant Biology for Breeding and Protection, 15 credits (BI, A1N);

Sustainable Plant Production: From Molecular to Field Scale, 15 credits (BI, A1N)

Year 2, elective courses (compulsory courses in bold)

- Specialisation – Plant Protection and Breeding (Campus Alnarp):

Integrated Pest Management in Sustainable Production Systems, 15 credits (BI/TD, A1N);

Applied Plant Biotechnology, 15 credits (BI/TD, A1N);

Advanced Plant Breeding and Genetic Resources, 15 credits (BI/TD, A1N);

Chemical Ecology for Sustainable Insect Pest Control, 15 credits (BI/KE, A1N);

Practical research training, 15 credits (BI, A1F);

Degree Project in Biology, 30 credits (BI, A2E);

Degree Project in Biology, 60 credits (BI, A2E)

- Specialisation – Abiotic and Biotic Interactions of Cultivated Plants (Campus Ultuna):

Experimental approaches in plant growth analysis and phenotyping, 15 credits (BI/LB, A1N);

Plant Pathology, 15 credits (BI, A1N);

Genetic diversity and plant breeding, 15 credits (BI, A1N);

Plant-Microbe Interactions, 15 credits (BI, A1N);

Practical research training, 15 credits (BI, A1F);

Degree Project in Biology, 30 credits (BI, A2E);

Degree Project in Biology, 60 credits (BI, A2E)

Both specialisations include a degree project for 30 or 60 credits in the main field of study, biology (A2E) as per the established course syllabus.

The courses offered may change during the course of the programme. This may require the establishment of a new programme syllabus, including transitional provisions. Decisions on the courses offered are taken well in advance of the next academic year.

For each course on the programme, there is a course syllabus which specifies the details of the course. Information on when courses are offered is available on the SLU student web.

Transitional provisions

Any student admitted before the autumn semester of 2023 has the right to complete their studies for a Degree of Master of Science in Biology, which is a general degree. Up until December 2025, it may be possible to award other degrees, provided the requirements pursuant to earlier regulations are fulfilled.

Other regulations

Gender equality, equal opportunities and sustainability

A successful study environment is characterised by transparency, gender equality and inclusivity. SLU works actively towards gender equality and equal opportunities in order to promote a climate that takes full advantage of the diverse backgrounds, life experiences and skills of our staff and students.

Additional information about the programme

Prior knowledge of cell biology and genetics is recommended.

It is also possible to take project-based advanced courses for 15 credits and a Master's project for either 30 or 60 credits at SLU in Umeå. This includes the Project-based Advanced Course in Biology at the Department of Forest Genetics and Plant Physiology and Master's Thesis in Biology, A2E: Forest Genetics and Plant Physiology.

General provisions for first- and second-cycle courses and programmes

For more information on semester dates, examination, credit transfer and admission to the latter part of a programme, please refer to the Education Planning and Administration Handbook available on the SLU student web.

Possibilities for further studies

Students who complete the Master's programme Plant Biology for Sustainable Production and are awarded a degree have the opportunity to continue their studies at the doctoral level.