Faculty of Science and Technology
Umeå University, 901 87 Umeå
Telephone: +46 (0) 90-786 50 00

Ref. No. FS 4.1.1-1295-25

UMEÅ UNIVERSITY

General syllabus for doctoral studies in Plant Science

with doctoral degree as goal

Scope: 240 higher education credits
Degree: Doctoral degree
Study level: Third-cycle
Established by: General syllabus established by the Faculty of Science and Technology Board on 2025-10-20
Enters into force: 2025-11-01
Responsible body: Faculty of Science and Technology

This document has been translated from Swedish into English. If the English version differs from the original, the Swedish version takes precedence.

1. Subject description and delimitation

Plant Science, in the sense of this syllabus, is the scientific field that studies physiological, molecular and developmental aspects of plants. It also refers to the study of how plants interact with each other as well as with the ecosystem surrounding them. Furthermore, the practical usage of plants and plant-based materials in agriculture, forestry and other industrial applications is included. Even though Plant Science shares similarities with other general fields of study, such as physiology, molecular biology, bioinformatics, biochemistry, cell-biology and ecology, the doctoral thesis should focus on a photosynthetic organism latu senso, including but not limited to plants, algae, and photoautotrophic prokaryotic species.

Holders of a doctoral degree in Plant Science are expected to have a good overview of the subject and a deep knowledge in their area of specialization. The latter is demonstrated by the ability to conduct research that makes significant contributions to the field.

2. Learning outcomes

The education is at third-cycle level. The goals for third-cycle education can be found in Chapter 1 of the Higher Education Act 9 a §. The learning outcomes for the degree of doctor in Plant Science are those specified by the Higher Education Ordinance, Chapter 6, Sections 4 and 5, where the terms *research field* and *area of specialization* are to be interpreted in accordance with the preceding section.

These learning outcomes are complemented by a gender and equal opportunities perspective, which is integrated in the content and organization of the program. It provides the student with additional insights into how the sustenance of inequality by traditional structures and perspectives can be counteracted. Sustainability perspectives are also integrated into the education through the exploration of science's possibilities and limitations in contributing to sustainable societal development, particularly in relation to the global goals of quality education, health, well-being, and resource and environmental issues.

3. Entry requirements and prerequisites

To be admitted for studies at doctoral level the applicant is required to meet the general entry requirements and the specific entry requirements as described below, and be deemed to have the necessary ability to benefit from the education. (Higher Education Ordinance, Chapter 7, Section 35)

General entry requirements

To fulfil the general entry requirements, the applicant must have qualifications equivalent to a completed degree at advanced level (second-cycle), or completed course requirements of at least 240 ECTS credits including at least 60 ECTS credits at advanced level, or has otherwise acquired essentially equivalent knowledge within Sweden or abroad. The faculty board may, in the case of a specific applicant, consent to an exemption from the general entry requirements if there are special reasons to do so. (cf. Higher Education Ordinance)

Specific entry requirements

To fulfil the specific entry requirements to be admitted to doctoral studies at in Plant Science, the successful candidate must have completed 90 ECTS in Biology or other subjects relevant to the research area, such as Chemistry, Physics, or Computer Science. Of these, at least 15 ECTS have to be in a subject directly relevant to the research topic and at least 15 ECTS from an individual project course. Good knowledge of English, both written and spoken, is also required.

The requirements for prior knowledge as described above are also considered to be met by those who have otherwise acquired essentially equivalent knowledge.

4. Selection

Selection among applicants who meet the entry requirements will be made with consideration of their ability to benefit from doctoral education, and is based on the following assessment criteria:

- personal suitability
- previous study results
- other merits

An applicant must not be given preference over another applicant during the selection process solely based on the assessment that this applicant can receive accreditation for previous education or professional activities. (cf. Higher Education Ordinance)

Decisions regarding admissions to studies at doctoral level concluding in a doctoral degree are made in accordance with Umeå University's delegation of authority.

5. Content and structure

5.1 General

An individual study plan is to be established for each doctoral student, which shall give details of financing, supervision, courses, thesis-related work, etc. For a doctoral degree, the studies shall entail 240 higher education credits (ECTS). A doctoral student can, if desired, pursue a licentiate degree as an intermediate goal.

5.2 Content

The program consists of coursework and thesis work which together corresponds to 240 ECTS. The course component consists of 30-60 ECTS and the thesis work of 180-210 ECTS.

5.2.1 Courses

Doctoral studies in Plant Science consist of a course component of at least 30 ECTS. The following courses are mandatory for all doctoral students with a doctoral degree in Plant Science as final goal:

Mandatory Courses that develop general skills:

- Introduction to Doctoral Studies at the Faculty of Science and Technology, 1 ECTS
- Writing Science, 5 ECTS
- Oral Presentation, 1 ECTS
- Science, ethics and society, 4 ECTS
- Introduction essay, 4 ECTS

Elective courses:

The remaining part of the course requirement is met by taking elective broadening and deepening courses in the subject, as well as courses that provide additional generic skills. Courses are chosen by the doctoral student in consultation with supervisors and should be largely adapted to the doctoral student's study specialization.

5.2.2 Doctoral thesis

Through the thesis, the doctoral student shall demonstrate that the national learning outcomes for the doctoral degree have been achieved. The doctoral thesis comprises at least 180 ECTS. It may be presented either as a coherent and unified scientific work (*monograph thesis*) or as a compilation of scientific papers accompanied by an introduction, summary, and discussion (*compilation thesis*). A compilation thesis must also include a description of the author's contribution to each paper.

The doctoral thesis shall be defended orally in public. The thesis is assessed with the following grades: G (Pass) or U (Fail). When setting the grade, attention will be paid to both the content of the thesis and its defence.

6. Examination

The doctoral degree is awarded after the doctoral student has completed a doctoral program of 240 ECTS credits as specified above, obtained a Pass grade in all examinations included in the program, and written and publicly defended a doctoral thesis that the examining committee has approved. The degree certificate is issued upon application to the Student Services/Examination Office.

7. Other instructions

The provisions that apply in respect of doctoral studies can be found in:

- The Higher Education Ordinance: Chapter 5 Employment of doctoral students, Chapter 6 Courses and study programs, and Chapter 7 Admission to courses and study programs, Annex 2 Qualifications ordinance.
- Admission regulations for doctoral education at Umeå University.
- Local degree ordinance at Umeå University.
- Rules for doctoral education at Umeå University.
- Handbook for doctoral studies at the Faculty of Science and Technology at Umeå University.

Appendix A

Learning outcomes for the doctoral degree

(Higher Education Ordinance, Chapter 6, Sections 4 and 5)

Knowledge and understanding

For the doctoral degree, the doctoral student shall

- demonstrate broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
- demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.

Competence and skills

For the doctoral degree, the doctoral student shall

- demonstrate the capacity for scholarly analysis and synthesis as well as to review and assess new and complex phenomena, issues and situations autonomously and critically
- demonstrate the ability to identify and formulate issues with scholarly precision, critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work
- demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through their own research
- demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing, and in dialogue with the academic community and in society in general
- demonstrate the ability to identify the need for further knowledge and
- demonstrate the capacity to contribute to social development and support the learning of others, both through research and education, and in some other qualified professional capacity.

Judgement and approach

For the doctoral degree, the doctoral student shall

- demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics, and
- demonstrate specialised insight into the possibilities and limitations of research, its role in society, and the individual's responsibility for how this is used.