



General syllabus for third-cycle studies in Plant Science

Scope: 240 higher education credits

The Degree: Degree of Doctor

Study level: Third-cycle

Established by: General syllabus established by the Faculty of Science and Technology Board on 28/5/2021

Enters into force: 14/09/2021

Responsible body: Faculty of Science and Technology

Field of Studies

Plant Science is in the sense of this syllabus the scientific field that study physiological, molecular and developmental aspects of plants. It also includes the study of how plants interact with each other and their local environment and the ecosystems in which they play a role. It also includes the practical usage of plants and plant-based material in agriculture, forestry and other industrial applications. Even though Plant Science shares similarities with other general fields of studies such as physiology, molecular biology, bioinformatics, biochemistry, cell-biology and ecology, the doctoral thesis should focus on a photosynthetic organism, including but not limited to plants, algae, and photoautotroph prokaryotic species.

Holders of the 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 as outlined above. To make it possible for the student to reach this depth, admission to third-cycle studies is restricted to areas of specialization in which appropriate supervision by senior researchers can be guaranteed.

Learning outcomes

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.

Entry requirements

To be admitted for studies at third-cycle level the applicant is required to meet the general entry requirements and the specific entry requirements that the board of the Faculty of Science and Technology Board has prescribed, and shall be considered as otherwise possessing that required to benefit from the studies. (cf. Higher Education Ordinance)



General entry requirements

To fulfil the general entry requirements, the applicant must have qualifications equivalent to a completed degree at second-cycle level, or completed course requirements of at least 240 ECTS credits including at least 60 ECTS credits at second-cycle level. The board of the Faculty of Science and Technology 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 for studies at third-cycle level in Plant Science at Umeå Plant Science Centre, the successful candidate must have completed 90 ECTS relevant to the doctoral thesis project. Out of this, at least 30 ECTS have to be in a subject closely related to the research topic of the graduate program. Applicants who have acquired equivalent skills in some other educational system in Sweden or abroad are also eligible.

Selection process

The selection among the applicants who meet the entry requirements is conducted with reference to their ability to successfully perform the third-cycle studies, and is based on the following assessment grounds:

- personal suitability
- previous study results
- other merits

However, 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 third-cycle level concluding in a doctoral degree are made in accordance with Umeå University's delegation of authority.

Contents and scheduling

General

An individual study plan must be established for each doctoral student. It shall give a detailed outline of the funding, upcoming supervision, foreseen courses, scientific plan



for the coming years, etc. For a degree of doctor to be awarded, the studies shall entail 240 ECTS. A doctoral student who is admitted for third-cycle studies that are to conclude with a doctoral degree can, if he/she so wishes, study for a licentiate degree as an intermediate goal.

Contents

Studies at third-cycle level that are to be concluded with a doctoral degree shall comprise a net study period of four years and consist of a course component of 30-60 ECTS as well as a doctoral thesis of 180-210 ECTS.

Courses

Third-cycle studies in Plant Science that are to be concluded with a doctoral degree consist of a course component of at least 30 ECTS. All courses are expected to be relevant to the third cycle study program and adapted to the individual needs and interests of the student.

Mandatory courses for the doctoral degree:

Courses that develop general skills accounting to 11,5 ECTS. The following general competency courses are mandatory.

- *Introduction to Doctoral Studies at the Faculty of Science and Technology*, 1.5 ECTS
- *Writing Science*, 5 ECTS
- *Oral Presentation*, 1 ECTS
- *Philosophy of Science*, 2 ECTS
- *Introduction to Research Ethics*, 2 ECTS

Elective courses for doctoral degrees:

Courses that develop skills suited to the project are divided so that 5-10 ECTS are literature and 10-15 ECTS are practical or technology oriented courses important for the completion of the research project. Literature and specific project courses will be selected by the doctoral student in consultation with the main supervisor and the reference group. The number of ECTS is determined individually depending on the student's previous knowledge but must, together with the list of mandatory courses above, not exceed 60.

Doctoral thesis

The doctoral thesis comprises at least 180 ECTS. Upon prior agreement with the supervisor(s) and reference group, the doctoral thesis may either take the form of a single coherent work (a monograph) or a compilation consisting of an introduction, a number of scientific papers, and a summary and discussion of the papers which includes a description of the author's contributions to each paper (compilation thesis).

The doctoral thesis shall be defended verbally 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 defense.



Examination

The degree of doctor can be awarded following the student's completion of third-cycle studies equivalent to 240 ECTS in Plant Science, and where the applicant has received the grade of "pass" for the different exams suggested by the study plan in addition to writing and publicly defending a the doctoral thesis approved by the Examining Committee. Degree certificates are issued following application to Student Services/Examina.

Other instructions

The provisions that apply in respect of third-cycle 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 studies at Umeå University.
- Local system of qualifications at Umeå University.
- Regulations for doctoral studies at Umeå University.
- Handbook for postgraduate students at the Faculty of Science and Technology at Umeå University.

Appendix A

Learning outcomes for the degree of doctor

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

Knowledge and understanding

For the degree of Doctor of Philosophy the third-cycle 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 degree of Doctor of Philosophy the third-cycle student shall

- demonstrate the capacity for scholarly analysis and synthesis as well 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 significant contribution to the formation of knowledge through his or her 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 degree of Doctor of Philosophy the third-cycle 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 responsibility of the individual for how this is used.