Biological Sciences

/ Biologiska vetenskaper /

SCB code: 10699

1 General description of the research area

The PhD studies area of Biological Sciences offers a comprehensive and interdisciplinary approach to the life sciences, ranging from molecular processes to ecosystems. Research in ecology includes studies of wetland organisms, ecosystem function, conservation biology, biological environmental monitoring, and theoretical and applied modelling of ecological systems. In ethology, animal behaviour is investigated, particularly in relation to behavioural genetics, domestication, cognition, animal welfare, and human–animal interactions. Genetics explores the mechanisms of heredity and genetic variation, with applications in evolutionary biology and domestication. Evolutionary biology examines how species adapt over time and provides insights into the processes driving biological diversity. Zoology integrates the study of animal physiology, behaviour, and anatomy, contributing to environmental conservation and management. In cell biology, the focus is on understanding the cellular and molecular mechanisms underlying life, which has major implications for both basic and applied research. Medical biotechnology combines biology and industrial biotechnology to develop environmental and medical methods for diagnosis, therapy, and sustainability.

2 Eligibility requirements and selection

The basic eligibility requirements as well as the general principles for selection are specified in the faculty's *Study Handbook for PhD Studies*.

2.1 Specific eligibility requirements

Admission to PhD studies in the research area of Biological Sciences requires the completion of at least 60 ECTS at the advanced level related to the field. These 60 ECTS must include an independent project of at least 30 ECTS within an area relevant to the subject of the PhD studies.

3 Degree

PhD studies in Biological Sciences lead to a Degree of Doctor or a Degree of Licentiate. The latter degree can also serve as a stage in the PhD studies. The Degree of Licentiate comprises 120 ECTS, of which the licentiate thesis corresponds to 90 ECTS, and courses of 30 ECTS, of which at least 20 ECTS must be at the PhD level. The Degree of Doctor comprises 240 ECTS, of which the doctoral thesis corresponds to 180 ECTS, and courses of 60 ECTS, of which at least 40 ECTS must be at the PhD level.

4 Goals and implementation of the PhD studies

The general goals and objectives of PhD studies are specified in the introduction to the faculty's *Study Handbook for PhD Studies*, as well as in the Higher Education Ordinance (reprinted in the *Study Handbook*'s appendix A).

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PhD studies in Biological Sciences provide the PhD student with the knowledge and skills necessary to fulfill all the required degree outcomes. The education consists of research and thesis work, courses, participation in seminars, and participation in national and international conferences.

The studies give the PhD student broad knowledge and understanding of their research area through broadening courses, joint faculty courses, and other activities such as participation in undergraduate education and industrial collaborations. Broad knowledge is also achieved through participation in seminar series at the department or division level, as well as within several national strategic research programmes. Broad knowledge is additionally gained by taking a wide range of courses within the subject area.

The PhD student acquires deep knowledge and understanding of their research field, particularly within their research focus, through participation in advanced courses, independent work in research projects, active engagement in discussions at seminars and conferences, and through publication of research results.

The PhD student develops familiarity with scientific methodology through their own research and by attending a mandatory course in research methodology.

The PhD student develops evaluation skills and academic attitudes through courses in research ethics, participation in seminars and conferences within their subject, and collaboration within the research group and with external partners. Intellectual independence is demonstrated, among other things, through the writing of the thesis.

The studies are designed to normally require four years of full-time study for the Degree of Doctor and two years for the Degree of Licentiate, provided that the PhD student has the necessary prerequisites and conducts full-time studies. If teaching or departmental duties are part of the PhD student's employment, the time required to obtain the Degree of Doctor may be extended by up to 12 months. The studies consist of both coursework and thesis preparation, as well as literature studies related to the research.

PhD students in Biological Sciences acquire skills and abilities, for example, by:

- Independently planning and conducting experimental research and analysing research results.
- Participating in seminars, presentations and discussions within the research environment, including regular presentation of results, plans for future work, and critical discussion of ongoing research.
- Participating in relevant national and international conferences and presenting research results orally and/or as posters.
- At first under the guidance of more experienced researchers, and later independently, leading the work of formulating research results in research reports and scientific articles.
- Critically analysing and reviewing reports and articles produced by others.
- Participating in non-core courses such as presentation techniques, leadership management, patent and materials legislation, methodology/ethics, and pedagogy (mandatory for PhD students who teach).

The studies provide the PhD student with an enhanced understanding of the potential of science to contribute to sustainable societal development. This is achieved through the faculty-wide course requirements as well as through participation in ongoing discussions, such as research seminars, and through reflection on the sustainability aspects of the PhD student's own research.

4.1 Thesis

The overall rules regarding the format, submission and grading of a thesis can be found in the faculty's *Study Handbook for PhD Studies*.

4.1.1 Licentiate Thesis

The thesis may consist of one or several scientific articles (which may be manuscripts) and can be written either as a coherent scientific work (monograph) or as a collection of scientific articles with an introduction to the field (compilation thesis). The number of articles may vary depending on the PhD student's contribution to each work, the number of co-authors, the scope, level, quality, and scientific contributions of the articles.

4.1.2 PhD Thesis

The results of the research are presented in a doctoral thesis, which may be written either as a coherent work or as a compilation of scientific articles. The thesis must meet quality requirements such that it is deemed to meet reasonable standards for acceptance for publication in high-quality scientific journals. A compilation thesis for a Doctoral Degree normally contains 2–4 articles, a substantial portion of which have been accepted for publication in international scientific journals. In a compilation thesis, it must be clearly stated what the PhD student has done and what contributions other co-authors have made.

4.2 Half-term seminar

The half-term seminar is mandatory for PhD students who intend to obtain a PhD degree but who do not conduct a licentiate seminar. The seminar is usually held after approximately half the study time has passed. The completion of the half-term seminar must be documented in the individual study plan.

4.3 Individual study plan

An individual study plan will be formulated for each PhD student. The detailed planning of courses and other components will be conducted in consultation with the supervisor and documented in the individual study plan (see *Study Handbook for PhD Studies*, section 5.3). The study plan should be established within one month after admission to PhD studies, and it should be revised at least once a year.

4.4 Supervision

The general regulations for supervision can be found in the *Study Handbook for PhD Studies*, section 4, and in the faculty's policy for supervision of PhD studies.

4.5 Courses

4.5.1 Faculty course requirements

Scientific theory, methodology, ethics, gender equality and sustainability

All PhD students admitted should complete mandatory courses as decided by the faculty in Scientific theory, methodology, ethics, gender equality and sustainability, or be deemed to have equivalent competencies, in order to receive a degree.

Pedagogic studies

All PhD students who teach should complete a basic course in pedagogy. At least 3 ECTS from this course should be included in the PhD studies, and any remaining credits should be counted as departmental duties (see *Study Handbook for PhD Studies*, section 5.5).

4.5.2 Subject related courses

It is recommended that PhD students take the course Introduction to PhD studies in Visualization Technology and Methodology at an early point of their studies. Moreover, it is recommended that PhD students take the courses Mathematical Foundations of Visualization Technology and Methodology as well as Research Methodology for Visualization Technology and Methodology.

4.5.3 Accreditation

Accreditation of course credits is regulated by the *Study Handbook for PhD studies*, section 5.6.

5 Other information

5.1 Transitional provisions

Changes to the general study syllabus do not apply to those who have already been admitted to PhD studies in the research area. A change to the new general study syllabus may however be approved if both the main supervisor and the PhD student agree. In such a case, this should be documented in the individual study plan.

6 Commencement

1. The General study plan comes into force 01 06 2025.