

# GENERAL STUDY SYLLABUS FOR THIRD- CYCLE STUDIES IN PHARMACEUTICAL SCIENCE

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# General study syllabus for third-cycle studies in Pharmaceutical Science

This study syllabus was adopted by the Board of Sahlgrenska Academy on 30 September 2010 and was subsequently revised by the Board on 26 October 2022.

Third-cycle studies are regulated by the provisions for third-cycle studies contained in the Higher Education Act, the Higher Education Ordinance and the policies, rules and plans established locally at the University of Gothenburg and Sahlgrenska Academy.

Third-cycle studies in Pharmaceutical Science lead to the award of a Degree of Doctor or Degree of Licentiate.

## General information about the studies

The purpose of third-cycle studies in Pharmaceutical Science is to train researchers for the needs of society, with high general competence and scientific cutting-edge expertise.

In addition to specialised knowledge within the area of pharmaceutical science and the subject area of the thesis, the studies will prepare the doctoral student for independent research or vocational activities, where high requirements are imposed for methodological skills and a deep insight into the subject together with the capacity for critical thinking, creativity and the search for knowledge. Furthermore the doctoral student will achieve good pedagogical skills and the ability to report research results verbally and in writing. The doctoral student will also develop skills in components of research work and the ability to collaborate and disseminate knowledge to doctoral (third cycle) students to such an extent that they can:

- identify and formulate scientific problems and also choose and apply relevant methods to solve such problems
- make assessments of research ethical aspects and demonstrate evidence of an ethical stance
- publish research results of high scientific quality
- communicate and develop contacts within the academic community and with society at large
- critically and constructively review the work of others within academic research and development
- opt for a career as a researcher and classroom teacher at a university/university college
- obtain specialist competence within the chosen subject area of Pharmaceutical Science

## Content

Third-cycle studies for a Degree of Doctor in Pharmaceutical Science correspond to studies of 240 higher education credits ('credits') in total. The studies comprise carrying out a scientific project. The project includes presenting research findings at scientific conferences and attending seminars at the student's department. In addition to this, the studies include successfully completing third-cycle courses (at least 30 credits). The doctoral student must also independently write a scientific compilation thesis or monograph corresponding to at least 120 credits.

Third-cycle studies for a Degree of Licentiate in Pharmaceutical Science correspond to studies of 120 credits in total. These studies comprise carrying out a scientific project and writing an academic paper together with

third-cycle courses corresponding to at least 15 credits. The academic paper may be a compilation thesis or a monograph.

## Third-cycle courses

Third-cycle studies for a Degree of Doctor in Pharmaceutical Science include compulsory and elective third-cycle courses as well as credit-yielding study activities that together correspond to at least 30 credits.

The compulsory courses comprise 15 credits:

1. Introduction to doctoral studies and information retrieval, 1.5 credits
2. Research ethics, 1.5 credits
3. Introduction to scientific writing and communication, 3 credits
4. Introduction to research theory and quantitative and qualitative design, 5 credits
5. Half-time seminar, 2 credits
6. PhD proficiency course with focus on grant writing, 2 credits

Additional third-cycle courses and subject-specific study activities comprising at least 15 credits are required for the Degree of Doctor. These are chosen by the doctoral student in consultation with the supervisor and doctoral examiner with consideration for the doctoral student meeting his/her intended learning outcomes.

Courses shall correspond to at least 8 credits. The following courses may be included:

- subject-specific depth of study courses,
- courses within basic research methods and methods relevant to the chosen subject area,
- pre-vocational courses.

Credit-yielding activities can comprise no more than 7 credits. The following activities can be included in the course part of the Degree of Doctor:

1. Active participation in international scientific conferences with the student's own presentation,
2. Active participation in research seminars/Journal Clubs at the department,
3. Education in laboratory animal science, which is compulsory for doctoral students who use laboratory animals in their thesis work,
4. Formalised literature studies,
5. Visit to another laboratory.

Doctoral students who wish to complete their third-cycle studies for the Degree of Licentiate at Sahlgrenska Academy must have completed the compulsory third-cycle courses 1-4 above (11 credits) and further third-cycle courses/activities comprising at least 4 credits.

All courses included in the doctoral student's third-cycle studies must appear in the individual study plan. The individual study plan must be revised in the event of any changes. Successfully completed courses and credit-yielding activities are to be documented in Ladok.

## Scientific thesis

A thesis in Pharmaceutical Science comprises a framework commentary and, normally, two to four articles. The doctoral project and findings are summarised in the framework commentary, including a detailed

account of the project's background, the questions at issue and methods. In addition, findings and relevance are discussed in a wider context.

The following applies to the articles:

- that they are to be of the scope and quality for the criteria set by Sahlgrenska Academy
- that the doctoral student is to be the primary author of at least one article
- that the articles should have been published in journals relevant to the subject/field
- that at least one article should have been published or accepted in a peer-reviewed journal

If no articles are included in the thesis, it is counted as a monograph.

## **Academic paper**

A licentiate thesis shall comprise a framework commentary based on

- at least one article that has been accepted or published in a peer-reviewed journal relevant to the subject/field at the time of the application for a licentiate seminar, or
- at least two manuscripts.

If no articles are included in the academic paper, it is counted as a monograph.

## **Aim of the studies**

Overall learning outcomes are shown in the Qualifications Ordinance (Higher Education Ordinance, Swedish Code of Statutes – SFS 1993:100, Appendix 2 – Degree Ordinance); see below.

### **Degree of Doctor**

#### *Knowledge and understanding*

For the Degree of Doctor, the doctoral student shall:

- demonstrate broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge within 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, the doctoral student shall:

- demonstrate the capacity for scholarly analysis and synthesis as well as to review and assess new and complex phenomena, questions at issue and situations autonomously and critically,
- demonstrate the ability to identify and formulate problems with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within pre-determined timeframes and to review and evaluate this work,
- demonstrate through a thesis their 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 society at large,
- 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 other qualified professional contexts.

*Judgement and approach*

For the Degree of Doctor, 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 science, its role in society and the responsibility of the individual for how it is used.

Scientific thesis (doctoral thesis)

For the Degree of Doctor, the doctoral student shall have been awarded a pass grade for a scientific thesis (doctoral thesis) of at least 120 credits.

**Degree of Licentiate**

*Knowledge and understanding*

For the Degree of Licentiate, the doctoral student shall:

- demonstrate knowledge and understanding in the field of research including current specialist knowledge within a limited area of this field as well as specialised knowledge of research methodology in general and the methods of the specific field of research in particular.
- competence and skills
- For a Degree of Licentiate, the doctoral student shall
- demonstrate the ability to identify and formulate problems with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within pre-determined timeframes in order to contribute to the formation of knowledge as well as to evaluate this work,
- demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and society at large, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for their own ongoing learning.

*Judgment and approach*

For the Degree of Licentiate, the doctoral student shall:

- demonstrate the ability to make assessments of ethical aspects of their own research,
- demonstrate insight into the possibilities and limitations of science, 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 their own ongoing learning.

### *Academic paper (licentiate thesis)*

For a Degree of Licentiate, the doctoral student shall have been awarded a pass grade for an academic paper of at least 60 credits.

## **Implementation**

Third-cycle studies are conducted within the framework of a doctoral project and in accordance with an individual study plan. The individual study plan will indicate how the doctoral student's research work will be conducted, which courses are to be included and other commitments. Changes to the specialisation and implementation of the research work, third-cycle courses or other commitments are to be documented in the individual study plan.

The doctoral student's progress in respect of courses implemented/planned and their research work is to be followed up at least once a year. The principal supervisor is responsible for implementing this follow-up.

The doctoral student must have completed the compulsory third-cycle courses 1-4 (11 credits) to be able to hold a half-time seminar. A half-time seminar (Half-time seminar, 2 credits), in which the scientific work is summarised and presented by the doctoral student, is compulsory and is to be announced publicly. The half-time seminar shall be held no later than the date on which, according to the individual study plan, there remains a period of study corresponding to two years of full-time study before the award of the Degree of Doctor.

The articles of the thesis/academic paper are reviewed by an examining committee in preparation for the public defence and licentiate seminar. The examining committee may, for example, propose changes and additional information that affect the date of the public defence and licentiate seminar. The thesis is to be published by 'nailing' (including electronic publication of the thesis) no later than three academic semester weeks before the public defence.

## **Qualifications**

A person meets the general entry requirements for third-cycle studies if they:

1. have been awarded a second-cycle qualification, or
2. have satisfied the requirements for courses comprising at least 240 credits of which at least 60 credits were awarded in the second-cycle, or
3. have acquired substantially equivalent knowledge in some other way in Sweden or abroad.

A person meets the specific entry requirements for third-cycle studies in Pharmaceutical Science if they:

- have successfully completed the English B/6 course or is considered to have acquired equivalent knowledge through previous studies (this assessment is made in accordance with the recommendations of the Swedish Council for Higher Education).

## Selection

In selecting between applicants who meet the general and specific entry requirements, their ability to benefit from third-cycle studies shall be taken into account. The assessment shall attach particular importance to documented qualifications for:

- specific knowledge and skills within the subject area and related research fields
- experience of scientific theory and relevant research methodology
- scientific analysis and presentation verified through an academic paper, degree project, scientific journals or the like

## Degree

As a rule, a doctoral student is admitted with the objective of obtaining a Degree of Doctor. Students can only be admitted to third-cycle studies with the objective of obtaining a Degree of Licentiate if the applicant so wishes. An applicant, who has been admitted to third-cycle courses for the Degree of Doctor may complete their studies with a Degree of Licentiate.

The successful completion of the public defence of a doctoral thesis and a registered third-cycle course component, comprising at least 30 credits, are required for the Degree of Doctor.

The successful completion of a licentiate seminar and a registered third-cycle course component, comprising at least 15 credits, is required for the Degree of Licentiate.

A degree certificate is issued for third-cycle studies taken and successfully completed following a request from the doctoral student. Doctoral degrees from Sahlgrenska Academy are titled the Degree of Doctor of Philosophy (for all PhD/third-cycle subject area) or Degree of Licentiate.

## Transitional provisions

This general study syllabus applies to doctoral students who have been admitted to the subject from 1 January 2023. Doctoral students who were admitted before 1 January 2023 have the right to change to this this general study syllabus. The individual study plan must then be revised.

For doctoral students who were admitted before 1 January 2023, the following applies:

Doctoral students who previously completed the course 'SM00018 Introduction to research, 8 credits' (part I of the compulsory third-cycle course during the period spring semester 2012-autumn semester 2022) should follow the previous rules and regulations and complete the course 'SM00019 Half time seminar, 5 credits' and the course 'PhD proficiency course with focus on grant writing, 2 credits', which replaces the course 'SM00044 PhD Proficiency Course, 2 credits' (part III of the compulsory third-cycle course during the period spring semester 2012-autumn semester 2022) starting from the spring semester 2023.

For doctoral students who completed the courses 'SM00018 Introduction to research, 8 credits' and 'SM00019 Half time seminar, 5 credits' during the period spring semester 2012-autumn semester 2022, starting from the spring semester 2023 should complete the course 'PhD proficiency course with focus on grant writing, 2 credits', which replaces the course 'SM00044 PhD Proficiency Course, 2 credits' (part III of the compulsory third-cycle course during the period spring semester 2012-autumn semester 2022).