

English translation, not certified, when
in doubt consult the Swedish version.

General study program for PhD studies in Organic Chemistry, incl. general syllabus for programs leading to a licentiate degree

Admissions to studies at the 3rd cycle level at Stockholm University should primarily be concluded with a doctoral degree.

National regulations concerning admission, studies and examination at the PhD level can be found in the *Higher Education Ordinance*, Chapters 5-7, 10, 12 and Appendix 2. In addition, at Stockholm University the following rules and regulations are in effect: *Admission Regulations for Doctoral Studies at Stockholm University*, *Regulations for 3rd Cycle Education and Examinations at Stockholm University*.

This General study program was adopted by the Board of Science on 2009-05-06, revised 2017-06-12 and 2020-11-16.

1 Subject description

Organic chemistry as subject is focused on the chemistry of the carbon compounds. The field includes synthesis and study of organic compounds and their reactivity (physical organic chemistry). Modern organic chemistry as a molecular science has a broad interface to biology (enzyme- and bioorganic chemistry), inorganic (organometallic chemistry) and physics (material science and polymer chemistry). Most of the processes in all forms of life are basically organic chemistry.

2 Program objectives

In addition to 1st and 2nd cycle studies, 3rd cycle (doctoral) studies should provide the knowledge and skills required to be able to conduct independent research.

The program should also prepare the student for other functions in the society requiring deep insight in chemistry and methods in chemistry.

The program leads to a licentiate or a doctoral degree. The objectives defined for these degrees in the *Higher Education Ordinance* are presented in sections 5 and 6 below.

3 Prerequisites and entry requirements

Admission to the PhD program requires that the applicant meets the general and specific entry requirements, in addition to being otherwise capable of completing the program in organic chemistry.

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3.1 General entry requirements

In order to meet the general entry requirements for doctoral studies, the applicant must have completed a 2nd cycle degree, completed courses equivalent to at least 240 higher education credits (hp, ECTS), of which 60 hp must be in the 2nd cycle), or have otherwise acquired equivalent knowledge in Sweden or elsewhere.

The Board of Science may permit an exemption from the general entry requirements for an individual applicant under special circumstances.

3.2 Specific entry requirements

Specific eligibility requirement is an approved independent work (e.g., diploma work) of at least 30 hp at the advanced (2nd cycle) level. The topic of the independent work has to be relevant for the announced area of the PhD program in organic chemistry.

4 Selection and admission

The selection between candidates who meet the entry requirements will be made with reference to their ability to benefit from the program. However, the fact that an applicant is deemed able to transfer credits from previous training or professional experience may not alone give the applicant priority over other applicants in the selection process. Admission decisions are made in accordance with current delegation of decisions.

Important assessment criteria are the following: solid background (good marks) in the theory of organic chemistry and experimental skills; fluent level in English language; ability to independent work; ability for expression in oral and written forms. The assessment is based on the applicant's transcript of record especially from 2nd cycle, recommendation letters from supervisors and teachers, as well as on interviews with the applicant, but also a personal letter from the applicant explaining her/his expectations and reasons for applying.

5 Programs leading to a doctoral degree

5.1 General provisions

Programs leading to a doctoral degree comprise four years of full-time study (240 hp).

Four years of full-time studies are required for the PhD degree. The program consists of courses, 60 hp, and a PhD thesis. A licentiate or a half-time control is a regular part of the program.

An individual study plan should be established for each PhD student, describing the courses to be taken and the thesis work. Even if the courses are planned to be taken before starting the thesis work, the student is recommended to discuss the subject for the thesis work at an early stage.

Objectives for doctoral degrees according to the Higher Education Ordinance

Knowledge and understanding

For a PhD, the PhD student must:

- demonstrate broad knowledge in, and a systematic understanding of the field of research, together with deep and current specialist knowledge in a defined part of this field;
- demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.



Skills and abilities

For a PhD, the PhD student must;

- demonstrate an ability to engage in scholarly analysis and synthesis, as well as in independent, critical review and assessment of new and complex phenomena, issues, and situations;
- demonstrate an ability to identify and formulate issues critically, independently, creatively, and with scholarly precision; to plan and conduct research and other advanced tasks using appropriate methods within specified time limits; and to review and evaluate such work;
- demonstrate an ability to make a substantial contribution to the development of knowledge through their own research in a thesis;
- demonstrate an ability, in both national and international contexts, orally and in writing, to present and discuss research and research findings authoritatively in dialogue with the scholarly community and society in general;
- demonstrate an ability to identify areas where further knowledge is required;
- demonstrate the potential to contribute to social development and support the learning of others, both in the fields of research and education and in other qualified professional contexts.

Judgement and approach

For a PhD, the PhD student must;

- demonstrate intellectual independence and scholarly integrity, as well as an ability to make ethical assessments relating to research;
- demonstrate specialized insight into the potential and limitations of research, its role in society, and the responsibility of the individual for how it is used.

5.2 Individual study plan (ISP)

An individual study plan must be established for each PhD student. The individual study plan should include:

- a research plan, including a timetable;
- information relating to how the supervision is organized;
- a plan of which courses/what type of courses the PhD student should take;
- a description of other academic activities, such as participation in seminars and reading courses;
- a description of other obligations the student and the department may have during the period of study;
- a financial plan covering the entire period of study;
- if the PhD student is not funded by means of employment, the financial plan should specify what social benefits apply to the type of funding in question, for example in the event of illness or parental leave.

The individual study plan should be established in consultation with the PhD student and her/his supervisor, and be reviewed at least once a year. The individual study plan should be adopted and reviewed in accordance with current delegation of decisions. When the individual study plan is reviewed, it should be specified how the doctoral studies relate to the qualitative targets outlined in the *Higher Education Ordinance*.

5.3 Courses and instruction

A total of 60 hp have to be acquired during the PhD studies. Depending on the specific area of organic chemistry (analytic, synthetic, theoretic or other) the PhD student is studying, there are different alternatives of courses that the PhD student can select in addition to the mandatory courses



Mandatory courses for PhD degree in Organic Chemistry:

- General Organic Chemistry, 10 hp
- Philosophy of Science and Ethics at the Department of Organic Chemistry, 3 hp
- Writing Science, 3 hp
- Teaching Chemistry at the Department of Organic Chemistry, 2 hp
- Communicating Science, 1 hp
- First aid, 1 hp

Other courses have to be selected in consultation with the PhD student's supervisor.

PhD students are expected to participate actively in seminars discussing current research findings. Courses or instruction may be provided in collaboration with other departments. Doctoral students are expected to make use of the provided opportunities to attend guest lectures, both in their own and adjacent subject areas.

5.4 Thesis

As part of the program, the student shall write an academic thesis. The thesis should reflect the PhD student's ability to complete the selected research task in a scholarly and independent manner, within or without a team work. The thesis should be of such quality that it could be considered to meet reasonable requirements for publication in an academic journal of good quality. The doctoral thesis should be written either as a unified, coherent academic work (monograph) or as a compilation of academic papers with a summary. The papers may be co-authored with other people, but the PhD student's contributions must be clearly distinguishable.

The thesis should be written in English. The department is responsible for the English summary of the thesis is translated into Swedish.

5.5 Supervision

Each doctoral student should be assigned a principal supervisor and at least one assistant supervisor. At least one of the supervisors be *Docent* and at least one should have received training in supervision or be considered to have corresponding qualifications. Decisions regarding supervisors are made in accordance with current delegation of decisions.

A PhD student is entitled to change supervisors upon request to the departmental board, in which case the individual study plan should be revised.

5.6 Examination and public defense

In order to receive a degree, the PhD student must have received a passing grade on the thesis and the examinations included in the program. Each course is usually concluded with a written or oral examination. In some cases, continuous examination may take place during teaching sessions or laboratory work. Examinations are assessed using the grades Pass or Fail.

The thesis should be defended orally at a public defense seminar. The defense seminar should follow the regulations of the Academic Area of Science at Stockholm University.



5.7 Credit transfer

Provisions concerning credit transfer can be found in the *Higher Education Ordinance*, Chapter 6, sections 6-8.

Courses that were part of the specific entry requirements cannot be accredited for the PhD degree.

Decisions regarding credit transfer are made in accordance with current delegation of decision.

6 Programs leading to a licentiate degree

Under special circumstances, the Board of Science may decide to allow admissions to programs that lead to a licentiate degree comprising at least 120 hp. An assessment that funding can be secured for the time required to complete a licentiate degree, but not a doctoral degree, does not alone constitute such a special circumstance.

Decisions to admit students to programs that lead to a licentiate degree are made in accordance with current delegation of decisions.

In cases where a student who has been admitted to a program leading to a licentiate degree student wishes to pursue a PhD degree, a new academic review and an analysis of the financial plan will be carried out before a decision to admit the student to a program leading to a PhD degree can be made in accordance with current delegation of decisions.

6.1 General provisions

A 3rd cycle program comprising at least 120 hp, or a part comprising at least 120 hp of a 3rd cycle program leading to a PhD degree, may be completed with a licentiate degree.

Even if the course component precedes the thesis component, the student is encouraged to discuss the topic of the thesis at an early stage.

Objectives for licentiate degrees according to the Higher Education Ordinance

Knowledge and understanding

For a Degree of Licentiate, the student must:

- demonstrate knowledge and understanding in the field of research, including current specialist knowledge in a limited area of this field, as well as specialized knowledge of research methodology in general and the methods of the specific field of research in particular.

Skills and abilities

For a Degree of Licentiate, the student must:

- demonstrate an ability to critically, independently, creatively, and with scholarly precision identify and formulate issues, and to plan and, using appropriate methods, complete a limited research project and other qualified tasks within specified time limits, so as to contribute to the development of knowledge and to evaluate this work;
- demonstrate an ability to present and discuss research and research findings clearly, in dialogue with the scholarly community and society in general, orally and in writing, in both national and



international contexts;

- demonstrate the skills required to participate independently in research and development and to work independently in other advanced contexts.

Judgement and approach

For a Degree of Licentiate, the student must:

- demonstrate an ability to make assessments of ethical aspects of their own research;
- demonstrate insight into the possibilities and limitations of research, its role in society, and our responsibility for how it is used;
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

6.2 Individual study plan

The individual study plan should be written the same way as for a doctoral degree, see 5.2.

6.3 Courses and instruction

A total of 30 hp have to be acquired under the licentiate studies.

Dependent on the specific area of the studies for the student, there are different alternatives for the courses to be selected in addition to the mandatory courses. The selection should be made in consultation with the supervisor.

Mandatory courses for PhD degree in Organic Chemistry:

- General Organic Chemistry, 10 hp
- Philosophy of Science and Ethics at the Department of Organic Chemistry, 3 hp
- Writing Science, 3 hp
- Teaching Chemistry at the Department of Organic Chemistry, 2 hp
- Communicating Science, 1 hp
- First Aids, 1 hp

The student is expected to participate actively in seminars discussing current research findings. Courses or instruction may be provided in collaboration with other departments. The student is expected to make use of the provided opportunities to attend guest lectures, both in her/his own and adjacent subject areas.

6.4 Thesis

As part of the program, the student shall write a licentiate thesis. The thesis should be of such quality that it could be considered to meet reasonable requirements for publication in an academic journal of good quality.

6.5 Supervision

See 5.5.



6.6 Examination

The first paragraph of 5.6 also applies to licentiate degrees. The examination of a licentiate thesis takes place at a publicly advertised licentiate seminar and should follow the regulations of the Academic Area of Science at Stockholm University.

6.7 Credit transfer

Provisions concerning credit transfer can be found in the *Higher Education Ordinance*, Chapter 6, sections 6-8.

Courses that were part of the specific entry requirements cannot be given credit for as part of the licentiate degree.

Decisions regarding credit transfer are made in accordance with current delegation of decisions.