Translation of Subject Curriculum (Study Plan) for Third-cycle (PhD) Education

Chemistry with specialization in Inorganic Chemistry

Swedish title: Kemi med inriktning mot oorganisk kemi

TNKEMI06


The Study Plan for third-cycle studies consists of three parts: a general part, this subject specific study plan, and each doctoral student's individual study plan.

Objective

Based on the basic training within the scientific discipline, the education on the graduate level shall result in a high level of knowledge, particularly within at least one sub-area of the discipline. Through supervision and writing of the thesis the doctoral student shall be prepared for a scientifically independent and critical professional role within areas in which a high level of scientific knowledge and research abilities are essential.

The doctoral student shall also be able to present her/his own goals and results orally and in writing to different target groups in English and, in the case of Swedish-speaking doctoral students, in Swedish.

Subject description

Inorganic chemistry focuses on the chemical compositions of inorganic compounds as well as their structures, reactivities and properties. Inorganic chemistry is a vast research area with a large number of applications including products within Swedish industry and the environmental sector. Examples of applications include: electronics, cutting tools, steel, hard metal, solar cells, batteries, fuel cells, catalysts, corrosion protection and sensors.
Eligibility

Basic Eligibility
The basic eligibility for third-cycle studies is described in the general part of the study plan.

Special Eligibility
A person has special eligibility for third-cycle education in inorganic chemistry if the person has passed examinations in courses of chemistry or in courses of areas of relevance to the discipline, corresponding to at least 90 HE credits (of which at least 60 HE credits should be on the advanced level and at least 30 HE credits within chemistry), or if the person otherwise has acquired the equivalent knowledge. More information regarding the special eligibility can be provided by the professor responsible for the third-cycle education.

Examples of educations providing special eligibility include candidate and masters programme in chemistry, including a minimum of 40 HE credits within inorganic chemistry at the advanced level, and the material chemistry branch of the chemical engineering programme, with at least 90 HE credits within this branch.

The research within inorganic chemistry is based on international collaborations and requires a significant global flow of information. It is therefore essential that the doctoral student is able to read and write scientific texts in English.

To be accepted as a doctoral student in inorganic chemistry it is required that the candidate is judged to have the ability required to conclude third-cycle education. The decision based on this evaluation of the ability is made by the head of the department in collaboration with the professor in charge of the third-cycle education, the professors responsible for the research programmes and the supervisors within the discipline.

Admission
Applicants for third-cycle studies in Inorganic chemistry must submit an application to the Head of the Department of Chemistry-Ångström. Admission to doctoral studies takes place normally several times per year.
Upon admission to postgraduate education, the Swedish title of the degree is to be specified in the application. According to decision (TEKNAT 2012/215), postgraduate education in Chemistry with specialization in Inorganic Chemistry shall lead to a filosofie doktorsexamen. The English rendering will be a licentiate/doctorate degree of philosophy.

At the time of admission, the department must provide a financial assistance plan demonstrating sufficient support to cover the maintenance of the applicant as well as her/his research.

Program structure

At the time of admission, each doctoral student and her/his supervisor shall draw up an individual study plan after consultation with the professor in charge of third-cycle studies. The plan is to be approved by the Head of the Department (by delegation of the Faculty Board) at the time of admission.

The individual study plan shall be annually reviewed by the doctoral student and her/his supervisor jointly, and supplemented with a summary of the achieved results and the plans for the coming year. Significant changes as well as any disagreement on the individual study plan shall be reported to the Head of the Department or, if deemed necessary, to the Third-cycle Educational Board.

Courses

The third-cycle studies may include different kinds of courses, such as lectures, literature studies, practical training, field studies, etc. The courses are intended to provide a wider insight into the subject as a complement to the competence acquired during research.

A course in research ethics (of at least 2 higher education credits) is mandatory for licentiate and doctoral degree. University educational theory is mandatory for doctoral students who teach at basic or advanced level.

The selection of the remaining courses is made together with the supervisors based on the specific research topic. These courses are selected in connection with the establishment of the individual study plan. Example of courses include: inorganic chemistry, inorganic structural chemistry, structural investigations using X-ray diffraction, chemical bonds, molecular spectroscopy, electrochemical methods,
electrochemical materials, energy relevant materials, theoretical materials modeling, solid state physics, surface physics, electronics, electron microscopy, super conduction, condensed materials theory, symmetry and vacuum technology. Courses given at other universities may also be included.

For the doctoral degree, a minimum of 25 HE is required within the field of chemistry.

The range of courses and the content of the literature courses are continuously revised. The graduate student may also be registered within a research school, with compulsory as well as elective courses given in Sweden or abroad.

The graduate courses are normally taken in the first part of the third-cycle education.

The course frequency depends on the availability of the required resources. The graduate student is expected to study parts of the course literature single-handed. Such independent study activities are important elements within the third-cycle education.

Exams for the third-cycle education courses may be given as written or oral exams and are arranged according to agreements between the graduate student and the main supervisor or the course responsible individual. The exams are marked using one of the grades: pass or fail.

The graduate student is expected to participate in the scientific activities at the department by e.g. taking active part in seminars and by attending invited lectures.

Requirements for doctoral degree
The requirements for the doctoral degree consist of passed examinations in the courses included in the approved individual study plan of each doctoral student, as well as a passed public defense of the degree project. The studies awarded a doctoral degree comprise 240 higher education credits (four years of full-time studies), of which the doctoral thesis comprises a minimum of 120 higher education credits and the course part a minimum of 40 higher education credits.
Requirements for licentiate degree
A doctoral student who has acquired at least 120 higher education credits (two years of full-time studies) is eligible for a licentiate degree. The requirements consist of passing the examinations included in the program stage and receiving a passing grade on an academic paper of at least 60 higher education credits. The part of the course amounts to a minimum of 20 higher education credits.

Other
The third-cycle education involves experimental and theoretical courses, literature projects, seminars and lectures as well as the research resulting in the thesis.

The research can be carried out both individually and in the form of collaborations with other individuals present within the department or elsewhere. The PhD student shall be trained to carry out independent research.

The PhD student shall normally take part in departemental duties including teaching, research, outreach and administration.