Linnæus University

Jnr: HL/2009-0187

Programme syllabus

Faculty Board of Science and Engineering
School of Natural Sciences

Kemi, magisterprogram, 60 högskolepoäng
Chemistry, Master Programme, 60 credits

Level
Second Level

Establishment of Programme
Established by Organisational Committee 2009-03-26

Date of Ratification
Approved by Organisational Committee 2009-09-15
The programme syllabus is valid from autumn semester 2010

Prerequisites
General entry requirements for second-cycle studies and specific entry requirements:

- 90 credits in Chemistry or the equivalent.
- English B/6 or the equivalent.

Description of Programme

The Master's programme in Chemistry aims to develop students' knowledge within chemistry in order to be able to take on board in a structured way even more knowledge in conjunction with a future career in the field of chemistry, or studies working towards a two-year Master's degree or research education.
There are a range of areas in our society where a good knowledge of chemistry is needed for the continuing development of society, the economy and the environment. Examples of such fields include environmental science, where an understanding of how different factors influence the environment requires a good knowledge of chemistry. Another area is the chemical industry, which includes the biotechnical industry, the paper and pulp industry, the pharmaceutical industry and sections of the food industry. In all of these industries, knowledge of chemistry is essential for development and analysis. In terms of turnover and number of employees the chemical industry accounts for 10% of total Swedish industry.

Objectives

Central objectives according to the Higher Education Ordinance
Knowledge and understanding
For the degree of Master of Science (one year) the students must
- demonstrate knowledge and understanding of their main field of study, including both broad knowledge in the field and substantially deeper knowledge of certain parts of the field, together with a deeper insight into current research and development work; and

- demonstrate deeper methodological knowledge in their main field of study.

Skills and abilities
For the degree of Master of Science (one year) the students must
- demonstrate an ability to critically and systematically integrate knowledge and to analyse, assess and deal with complex phenomena, issues and situations, even when limited information is available.
- demonstrate an ability to independently identify and formulate issues and to plan and, using appropriate methods, carry out advanced tasks within specified time limits
- demonstrate the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them, in dialogue with different groups, orally and in writing
- demonstrate the skill required to participate in research and development work or to work independently in other advanced contexts.

Judgement and approach
For the degree of Master of Science (one year) the students must:
- demonstrate an ability to make assessments in their main field of study, taking into account relevant scientific, social and ethical aspects, and demonstrate an awareness of ethical aspects of research and development work;
- demonstrate insight into the potential and limitations of science, its role in society and people's responsibility for how it is used; and
- demonstrate an ability to identify their need for further knowledge and to take responsibility for developing their knowledge.

Programme specific objectives
After completion of the programme for the degree of Master of Science (one year), the student should be able to:
- describe and problematize complex chemical questions, including an overview of advanced knowledge within certain parts of the subject area
- independently perform chemical laboratory work
- independently assess, apply and communicate various methodologies used in chemistry
- independently analyse and apply scientific principles and theories within chemistry
- undertake independent appraisals of research ethical issues
- independently plan, perform, evaluate and present research work
- seek information in the scientific literature, critically appraise research results and present the results of research in both written and oral forms, in accordance with copyright laws.

Content
Organisation

The programme is offered by the School of Natural Sciences. The programme director and programme advisory board provide support for the programme. Each student will follow an individual study plan, established by the programme director after consultation with the student.

Programme overview
The degree programme´s structure and content are designed so that the student can develop advanced knowledge within the field of chemistry. Normally the studies should be undertaken on a fulltime basis but the possibility of flexible learning may be discussed. Teaching includes several forms and may be both campus and web-based. The normal language of instruction is English, though all courses can be given in Swedish if only Swedish speaking students are participating.

The first course (Research Methodology, 15 credits) aims to provide the student with a further development and refinement of the tools necessary for advanced studies, e.g. informatics, philosophy of science, research ethics, presentation technique, statistics, literature searching, GLP, entrepreneurship and how one performs chemical research in a safe manner (laboratory safety)
This first 15 credit course is followed by a 15 credit course in advanced chemistry within sectors of this discipline where Linnaeus University has well documented experience in research, research education and teaching. Several subcourses are available at Linnaeus University. These courses are directly related to the competence we have within the field of chemistry and other related subject areas. This 15 credit course aims to provide the student with advanced knowledge and understanding and further training in methodologies and experience of independent work within the field of chemistry. It is also possible to take courses at second cycle level at other universities. The programme finishes with a degree project equivalent to 30 credits. The degree project should be an independent study within the subject area of chemistry conducted on the basis of a scientific question and should preferably be conducted together with a research group within academia or industry. The project should also prepare the student for possible future studies at the next level (a two-year Master's degree or research studies).

Programme Courses

Semester 1
Research Methodology 15 higher education credits, A1N
Advanced Chemistry block 1 15 higher education credits *, A1N

Semester 2
Degree Project 30 higher education credits*, A1E
Alt.
Advanced Chemistry block 1 15 higher education credits *, A1F
Degree Project 15 higher education credits*, A1E

*Course within the main subject area of Chemistry

All courses are obligatory but courses with equivalent content may be included, after approval by the director of undergraduate and advanced studies or the programme director.

Work experience and community contacts
The programme's relevance for the chemical sector and industry and society in general is conveyed through the participation of sector and industrial representatives in the programme advisory board, and through the possibility of performing degree project work outside of Linnaeus University.

Foreign studies
The opportunity to take courses or conduct a degree project with a comparable content at a foreign university is available.

Scope of the programme
Sustainable development – the influence of laboratory work on the environment is an important aspect of the programme, including the role of research in society and people's responsibility for how research is used.

Internationalisation – the participation of foreign staff in the teaching is of central importance in the programme.

Quality Development

An evaluation of the programme is undertaken after each course by students and

teaching staff. The results of the course evaluations are available from the department. Feedback to students takes place through the presentation of the previous evaluation at the start of a course.

Strategic questions concerning the degree programme's structure and content are handled by the programme advisory board (see above) and the education committee.

Degree Certificate

After successful completion of programme studies, where the completed studies correspond to the requirements as prescribed by the relevant Swedish Higher Education Ordinances and the additional specific requirements stated by Linnaeus University, the student may apply for the award of the degree. Students that have satisfactorily fulfilled the requirements for the Chemistry Master programme can apply for the following degree.

Filosofie magisterexamen
Huvudområde: Kemi
Master of Science (60 credits).
Main field of study: Chemistry.

The degree certificate is in Swedish and English. A diploma supplement (in English) accompanies the diploma.