



Programme syllabus

Faculty of Health and Life Sciences

Kemi, masterprogram, 120 högskolepoäng

Chemistry, Master Programme, 120 credits

Level

Second Level

Date of Ratification

Approved by Faculty of Health and Life Sciences 2023-09-07

The programme syllabus is valid from autumn semester 2024

Prerequisites

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

- 90 credits in Chemistry or the equivalent
- English 7 or the equivalent.

Description of Programme

The Master's Programme in Chemistry aims to develop students' knowledge within chemistry in order to equip the student with the tools for a career in the chemistry sector or research education.

Chemistry plays a continuing and pivotal role in the development of society. Areas such as environmental science and the food industry are heavily dependent upon chemistry and chemists. The chemical industry, which includes biotechnology, pulp and paper, and pharmaceutical industries, accounts for 10% of Sweden's GDP.

Objectives

Central objectives according to the Higher Education Ordinance

Knowledge and understanding

For a Degree of Master (Two Years) students must

- demonstrate knowledge and understanding in their main field of study, including both broad knowledge in the field and substantially deeper knowledge of certain parts of the field, together with deeper insight into current research and development work; and
- demonstrate deeper methodological knowledge in their main field of study.

Skills and abilities

For a Degree of Master (Two Years) 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 critically, independently and creatively identify and formulate issues and to plan and, using appropriate methods, carry out advanced tasks within specified time limits, so as to contribute to the development of knowledge and to evaluate this work;
- demonstrate an ability to clearly present and discuss their conclusions and the knowledge and arguments behind them, in dialogue with different groups, orally and in writing, in national and international contexts; and
- demonstrate the skill required to participate in research and development work or to work independently in other advanced contexts.

Judgement and approach

For a Degree of Master (Two Years) 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 of further knowledge and to take responsibility for developing their knowledge.

Programme specific objectives

After completion of the programme, the student should be able to:

- identify and describe problems related to complex questions in chemistry
- independently perform chemical laboratory work
- independently assess, apply and communicate methodologies used in chemistry
- independently analyse and apply scientific principles and theories from within chemistry
- undertake independent appraisals of research ethical issues
- independently plan, perform, evaluate and present research undertakings
- seek information in the scientific literature, critically appraise research results and present the results of research in both written and oral forms, after due diligence concerning copyright issues.

Content

Programme overview

The programme is offered by the Department of Chemistry & Biomedical Sciences. The programme director and programme advisory board support the running and continued development of the programme. Each student will follow an individual curriculum, which is approved by the programme director after consultation with the student. The individual curriculum should include the courses planned within the programme and detail any planned international exchange activities.

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 full-time basis, though some possibilities for part-time studies can potentially be accommodated following discussion and eventual approval by the program coordinator. The formal teaching activities include both campus studies (including lectures, seminars, demonstrations, practical exercises, projects, study visits etc) and some web-based activities. 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 in the Natural Sciences, 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, and how one performs chemical research in a safe manner (laboratory safety).

This first 15 credit course is followed by a series of three 15 credits courses (60 credits) in advanced Chemistry within sectors of this discipline where Linnaeus University has well documented experience in research and research education. These three 15 credit courses aim to provide the student with advanced knowledge and understanding, and further training in methodologies and experience of independent work within the field of Chemistry. Furthermore, the possibility exists to study other courses offered by Linnaeus University as part of this 60 credit course series. It is also possible to study courses at other universities. The degree programme concludes with an independent study within the field of Chemistry corresponding to 60 credits. The chemistry-oriented examination project should be conducted under the guidance of either an academic research group, or in industry. The project should also prepare the student for possible future studies at the PhD level.

Programme Courses

All courses are obligatory, but courses with equivalent content may be included, after approval by the director of undergraduate and advanced studies or alternatively the programme director. If alternative courses are to be included, the program coordinator ensures that the program's goals are still being met. The prerequisites for courses, as well as the local regulations for graduation at Linnaeus University, must always be fulfilled.

Year 1

Research Methodology in the Natural Sciences, 15 credits, A1N

This course aims to provide the student with generic knowledge necessary for working on research-oriented studies in chemistry at an advanced level. It covers topics such as research ethics, presentation techniques, philosophy of science, statistics, laboratory safety, and literature search.

Current Pure and Applied Chemistry, 15 credits, A1N*

The course Current Pure and Applied Chemistry provides students with an overview of key areas in chemistry and its applications, as well as exposure to ongoing research at Linnaeus University.

Project Work in Chemistry I, 15 credits, A1F*

An individual curriculum consisting of theoretical and practical components that enhance the student's knowledge and skills within the area selected by the student in consultation with the program coordinator for the master's thesis.

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Year 2

Degree Project in Chemistry, 60 credits, A2E*

The student acquires an in-depth understanding of the field of chemistry by demonstrating advanced knowledge and skills in problem formulation, relevant literature, laboratory work, result analysis, and scientific writing. It is expected that the student independently completes and defends their master's thesis.

*Course within the main field of Chemistry

Societal relevance

The program's connection to the labor market is established through the involvement of stakeholders in the program council, several courses, and the opportunity to carry out the master's thesis outside Linnaeus University.

Internationalization

Opportunities for international studies are available through individual courses with equivalent content or the master's thesis. The participation of foreign instructors in teaching is a crucial aspect of the program's internationalization.

Sustainable Social Development

Sustainable development and the potential impact of laboratory work on the environment are essential components of the education. The program highlights the possibility of using chemistry to improve the conditions for sustainable social development.

Quality Development

The continuous evaluation of the programme is undertaken after each course by students and teaching staff. The results of the course evaluations are available through the Faculty's administration. 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.

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 made by Linnaeus University, the student may apply for 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

Degree of Master of Science (120 credits)

Main field of Study: Chemistry

Degree certification is in both Swedish and English. A diploma supplement (in English) accompanies the diploma.