



Programme syllabus

[An accessible version of the syllabus can be found in the Course and programme directory.](#)

Degree Programme in Chemical Engineering 180 credits

Högskoleingenjörsutbildning i kemiteknik

Valid for students admitted to the education from autumn 09 (HT - Autumn term; VT - Spring term).

This is a translation of the Swedish, legally binding, programme syllabus.

Programme objectives

The Bachelor of Science programme in Chemical Engineering educates students for work on a wide range of chemical and chemical engineering activities. The study programme has a theoretical and applied profile and the graduates will be able to use and develop new technologies in the chemical and chemical engineering field.

The study programme also aims to provide the students with knowledge about how the technology affects society with respect to the human situation and needs, and goals of society for economic, social and ecologically sustainable development.

In order to comply with the acceleration of technical progress and the changes this brings, the students should have the ability to understand the new technical areas. The student should also be given a good background for continued personal development and life-long learning both within their own focus area and within new subject areas.

Knowledge and understanding

- demonstrate knowledge of the scientific basis for the physical and chemical processes, different types of energy and their transformation and the importance of the chemical, thermodynamic and kinetic aspects of chemical reaction and process routes
- be able to apply relevant knowledge in mathematics, natural science and technology within chemistry and the chemical engineering area
- have knowledge about Swedish and international chemical industry and the current research and development efforts

Skills and abilities

- show autonomous capacity to formulate, analyze and manage technical problems in chemistry and chemical engineering areas
- demonstrate the ability to assess the reasonability in solutions, and compare and evaluate alternative solutions
- demonstrate good laboratory skills and knowledge about safe chemical handling
- have the ability to plan, implement and evaluate experiments both on laboratory-scale and on a larger scale
- show ability to collaborate with other people and to work efficiently in projects
- have the skills to communicate orally and in writing with different target-groups in Swedish and assimilate the English literature
- demonstrate the ability to use computer tools for calculations and information retrieval. on the basis of chemical and chemical engineering expertise, be able to assess a business or the product's environmental impact and to select and develop measures to eliminate or limit the harmful effects

Ability to make judgements and adopt a standpoint

- be able to search and critically review information
- be able to take a stand on issues of scientific, social and ethical nature in their professional field
- demonstrate the ability to identify the need for additional knowledge in order to develop their Skills

Extent and content of the programme

Nominal study period is 3 years, which corresponds to 180 credits at basic level. The programme is given in Swedish.

Eligibility and selection

In order to be admitted to the programme, basic eligibility and specific competence in Mathematics Course D, Physics course B, Chemistry course A, is required. In each subject, the passing grade G or 3 is the minimum requirement. The grade selection (BG and DB) is applied to two- thirds of the seats. Seats are distributed proportionally, based on the number of qualified applicants into two groups. Test-selection is applied in a third of the seats per programme.

Implementation of the education

Structure of the education

The majority of the courses in the programme use the grading system A-F. The study year is normally divided into 4 study periods and two or three courses are taken simultaneously at each period. Teaching and examination methods vary between courses. Normally, a proportion of the course is lectures, which gives an introduction with the concepts and theories. Exercises, seminars and laboratory work enhance the understanding of the theoretical relationship. Projects, based on the industrial model, have an essential role in the education. These projects are designed to improve group skills when working with real-life assignments from an engineering point of view.

In order to create a continuity of the program, collaboration between courses within each study year, as well as between study years, is emphasized. The programme is completed by doing a degree project, which is often carried out with a commission outside the school.

The programme's first year is mainly devoted to courses in mathematics and basic chemistry. During the second year, the courses predominately consist of chemistry subjects. The programme's third year consists of advanced courses in chemistry, chemical engineering and environment. The program includes 24 credits elective courses in which students can choose to raise their profile. These courses are normally taken during the programme's second and third years.

Courses

The programme is course-based. Lists of courses are included in appendix 1.

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Grading system

Courses in the first and the second cycle are graded on a scale from A to F. A-E are passing grades, A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

A seven scaled grading system from A-F is used for courses at basic and advanced level at KTH. A-E are passing grades, where A is the highest grade. The grades pass (P) and fail (F) are used for courses under certain circumstances.

The grade Fx implies an opportunity to complement a failed grade to the passing grade E.

Conditions for participation in the programme

Semester registration and course selection

All students should submit a study registration / study notification via “Mina Sidor” at the latest November 15th for the spring and May 15th for the fall semester. The study notification is the basis for the semester registration. This enables the grade registration and payment of student-aid from CSN. The students who have not fulfilled the conditions for advancement must contact the study year’s coordinator.

The course selection is normally done in association with the study notification. Detailed information is provided by the course coordinator. If the number of students who choose a particular course exceeds the number of places on the course, the students who have the course as a mandatory course in the programme, have priority over other applicants

Conditions for advancement

For studies in year 2, at least 37.5 credits from the first year are required. The students, who have not passed the credit limit after the re-exam period in August, must contact the educational coordinator for an individual study plan.

At least 90 credits must be achieved before the start of study year 3. The students, who have not fulfilled this requirement, must contact the educational coordinator for an individual study plan.

Course Registration

Each student should register for the course on the first scheduled lecture. Students, who have been registered on a course and then decide not to pursue the course, must notify that immediately to the teacher who is responsible for the course.

It is each student's responsibility to ensure that prerequisites from previous courses are reached before starting a new course. Information about prerequisites is assigned in the respective syllabus.

Study break

To take a break in the studies means that the student does not participate in lectures for at least one semester.

Approved study break gives the student the right to return to the studies at the stated date. During this break, the student may do supplementary examinations and participate in examinations in previously started courses.

The application concerning a study break must be handed in to the student office. When the student intends to resume the studies, a semester registration is required, see Conditions for participation in the programme.

After the study break, if the student has not applied for the semester registration or prolonged study break, it will be recorded as a withdrawal from the programme.

Recognition of previous academic studies

The student has the right to transfer course credits from the college / university within or outside the country. The precondition is that the course / courses are of such a nature and has such an extent that they basically correspond to the qualification criteria for the programme. In the case of whole courses, it must be checked by the programme director. Part of a course is checked by the examiner.

Overlap

Courses that in contents overlap with another or other courses in the programme cannot be counted within the framework of the 300 credits, which is the basis for the degree.

Studies abroad

Students in the program have the opportunity to study one academic year or one semester abroad at a foreign institution, which KTH is cooperating with. The students don't need to pay the fees which would otherwise be charged by foreign students. Exchange studies can be done in the third, fourth and fifth year of the programme. It is also possible to do the Master's thesis abroad. Information about studying abroad is given by the international coordinators at the student office of BIO, which also provide information on current application period. The students can find the application forms at the student Office. After evaluation, the exchange studies can count as part of the programme. The outgoing student must set up a "Learning Agreement" with the programme director, which implies the prior approval of the exchange studies. The studies are normally given in the language spoken in the selected country / region. There are opportunities, for those who are accepted to the exchange programme in German-, French-, Spanish- and Italian-speaking countries, to follow a preparatory language course before the regular semester begins.

Degree project

The program includes a degree project of 15 credits. That means about 10 weeks of full-time studies;

The following apply for the degree project work:

- It may be started at the earliest after 120 credits are achieved and when the final grades are in the relevant courses, which affect the content of the degree project.
- It may be started after the assignment is approved by the programme director

- It is based on the knowledge, which has been acquired during the study time and it is normally carried out during the sixth semester.
- It must constitute proof of an independently, engineering-related work summarizing theoretical and/or experimental work with a corresponding written report and oral presentation.
- It can be carried out at a company or at KTH.

The supervisor and examiner are appointed by the programme director.

Degree

To receive a Degree of Bachelor of Science in Chemical Engineering passing grades in all courses that are included in the student's study plan, are required. The study plan consists of the mandatory courses, the recommended and / or conditionally elective courses that the students have followed and the thesis. The study plan should include at least 180 credits.

For receiving a degree certificate, the student need to apply for it on an application form and provide a copy of a student union card, copy of receipts or a certificate from the student union for paid union fee.

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions



Appendix 1: Course list

Degree Programme in Chemical Engineering (TIKED)

General courses

Year 1

Mandatory courses (60.0 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|---------------------------------------|---------|-------------|
| KH1110 | Mathematics | 12.0 hp | First cycle |
| KH1120 | General and Physical Chemistry | 15.0 hp | First cycle |
| KH1121 | Organic Chemistry | 9.0 hp | First cycle |
| KH1122 | Analytical Chemistry | 7.5 hp | First cycle |
| KH1130 | Chemical Engineering and Technology 1 | 7.5 hp | First cycle |
| KH1150 | Engineering Skills | 9.0 hp | First cycle |

Supplementary information

Study year 1 consists of mandatory courses.

Year 2

Mandatory courses (49.5 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|---|---------|-------------|
| KH1211 | Mathematical Statistics | 4.5 hp | First cycle |
| KH1223 | Biotechnology | 7.5 hp | First cycle |
| KH1231 | Chemical Engineering and Technology 2 | 21.0 hp | First cycle |
| KH1241 | The Role of Chemical Engineers in Sustainable Development | 6.0 hp | First cycle |
| KH1251 | Electrical Measurements, Control Theory and Practice | 6.0 hp | First cycle |
| KH1252 | Business Administration | 4.5 hp | First cycle |

Optional courses

| Code | Name | Credits | Edu. level |
|------------------------|---|---------|-------------|
| DN1212 | Numerical Methods and Basic Programming | 9.0 hp | First cycle |
| SF1626 | Calculus in Several Variables | 7.5 hp | First cycle |

Recommended courses

| Code | Name | Credits | Edu. level |
|------------------------|--------------------------------------|---------|-------------|
| KD1130 | Inorganic Chemistry | 6.0 hp | First cycle |
| KH1400 | Water Chemistry | 7.5 hp | First cycle |
| KH1401 | Organic Chemistry, Advanced Course 1 | 6.0 hp | First cycle |
| KH1405 | The Fuel Cell | 6.0 hp | First cycle |

Supplementary information

Study year 2 consists of mandatory and recommended courses.

The optional courses DN1212 and SF1626 are recommended for students who intend to pursue further studies at one of the masters programme that the School of Chemical Science provides.

Year 3

Mandatory courses (46.5 Credits)

| Code | Name | Credits | Edu. level |
|------------------------|--|---------|-------------|
| KH1324 | Analytical Chemistry 2 | 7.5 hp | First cycle |
| KH1332 | Chemical Engineering and Technology 3 | 9.0 hp | First cycle |
| KH1341 | Environmental Technology | 7.5 hp | First cycle |
| KH1353 | Organisational Development and Leadership for Engineers | 7.5 hp | First cycle |
| KH139X | Degree Project in Chemical Engineering and Technology, First Cycle | 15.0 hp | First cycle |

Optional courses

| Code | Name | Credits | Edu. level |
|------------------------|---|---------|-------------|
| DN1212 | Numerical Methods and Basic Programming | 9.0 hp | First cycle |
| SF1626 | Calculus in Several Variables | 7.5 hp | First cycle |

Recommended courses

| Code | Name | Credits | Edu. level |
|------------------------|---------------------|---------|-------------|
| KD1130 | Inorganic Chemistry | 6.0 hp | First cycle |

Supplementary information

Study year 3 consists of mandatory courses and recommended courses (at least 12 hp). Study year 3 ends with a degree project.

The optional courses DN1212 and SF1626 are recommended for students who intend to pursue further studies at one of the masters programme that the School of Chemical Science provides.



Appendix 2: Specialisations

Degree Programme in Chemical Engineering (TIKED)

This programme has no specialisations.