Programme syllabus

Degree Programme in Chemical Science and Engineering
Civilingenjörsutbildning i kemivetenskap
300.0 credits

Valid for students admitted to the education from autumn 11 (HT - Autumn term; VT - Spring term).

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

Programme objectives

Knowledge and understanding

To receive a Degree of Master of Science in Chemical Science and Engineering, the students should:

- demonstrate knowledge of the scientific basis for physical and chemical processes, different kinds of energy and their conversion, the properties and use of different material, and to assess the applicability of the used models in different contexts.

- demonstrate knowledge of the importance of chemical, thermodynamic and kinetic aspects of chemical reaction and process routes

- be able to apply knowledge of mathematics, numerical analysis and other sciences in chemistry and chemical engineering field

- demonstrate in-depth knowledge in a chemical or chemical engineering focus area, and insight into current research and development

Skills and abilities

To receive a Degree of Master of Science in Chemical Science and Engineering, the students should:

- demonstrate the ability to develop chemical products and to design, operate and control the processes by applying a systematic thinking in terms of raw materials, energy, security, environment, economy, human conditions and needs, and goals of society for sustainable development

- demonstrate the ability to identify, formulate and manage current and real problems drawn from industry, society and research, taking into account the potential and limitations
• demonstrate the ability to make assessment of the reasonableness of the obtained solutions, and compare and evaluate alternative solutions

• demonstrate laboratory skills and knowledge of safe chemical managing, and the ability to implement and evaluate experiments on a laboratory scale and on a larger scale plan

• demonstrate the skills to use computer tools for simulation, technical calculations and information retrieval

• demonstrate the ability to orally and in writing, in Swedish and English, present and discuss ideas and outcomes and communicate with persons with or without the technical-scientific background

• demonstrate ability to effectively work as a team and plan and implement projects within a given framework

**Ability to make judgements and adopt a standpoint**

• demonstrate the ability to critically review the literature and technologies in areas related Chemistry and Chemical Engineering.

• demonstrate the ability to take a stand on issues of ethical nature in their professional field

• demonstrate an understanding for the fact that chemistry and chemical engineering problems can be complex, incompletely defined and contain contrarious conditions, and also consider social, economic, commercial, environmental and working-environmental aspects

• demonstrate the ability to rapidly acquire knowledge in new areas and to apply new knowledge for innovation and development of chemical products and chemical engineering processes

**Extent and content of the programme**

The Degree Programme in Chemical Science and Engineering is composed of 300 higher education credits, which at the normal study speed corresponds to 5 years of full-time studies (10 terms).

The first three years of the programme (180 higher education credits) is in the first cycle and can, if the student applies for it, be finished with a Degree of Bachelor of Science. The last two years are mainly in the second cycle (120 higher education credits) and leads to a Degree of Master of Science in Engineering/Degree of Master of Science (Two Years).

For more information, see
http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examina/1.27227

**Masters programmes available for Chemical Science and Engineering students 2011/2012**

- Molecular Science and Engineering
- Chemical Engineering for Energy and the Environment
- Macromolecular Materials
* The list of masters programmes is subject to change. Updated lists of all masters programmes can be found in the study handbook for the respective study year.

**Language of instruction**
The language of instruction, during the first three years of the programme is mostly Swedish; although English literature will be used. The concluding two years some courses are given in Swedish and some in English. For each course the language of instruction is found in the Course and program directory on the KTH student web site.

**Eligibility and selection**

In order to be accepted to the Degree programme, in Chemical Science and Engineering the basic eligibility requirements as well as the following requirements must be met:

Area of competence 9 *, as well as
Mathematics E
Physics B
Chemistry A
All with at least a grade of G.

In order to be accepted to the Degree programme, in Chemical Science and Engineering, International Profile the basic eligibility requirements as well as the following requirements must be met:

Area of competence 9 *, as well as
Mathematics E
Physics B
Chemistry A
Swedish B/Swedish 2B
All with at least a grade of G.

- The international profile, European languages, also requires courses C-language B / Language 3, in one of the languages German, French or Spanish.
- Japanese and Chinese is a beginner's language. No prior knowledge of the languages is required.

For eligibility requirements and selection guidelines, see KTH's admission policy
http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/antagning/1.27186

* For more information about “area of competence 9”, see www.hsv.se

**Implementation of the education**

**Structure of the education**

**Study year 1-3**
The programme plan for the degree programme, in Chemical Science and Engineering consists of compulsory courses in mathematics, physics, chemistry and chemical engineering during study year 1-2. Study year 3 contains applied chemical engineering courses, as well as leadership, economy and career planning. There is also a course about Technology for Sustainable Development and a degree project, first level, for a degree of bachelor of science.
Study year 4-5
During study year 4 and 5 the programme continues with courses at advanced level within a Master’s programme, recommended of the degree programme in Chemical Science and Engineering.

The programme is designed in such a manner that the student after three years of studies can obtain a degree of bachelor of science. The student can then continue his/her studies at the Biotechnology programme, continue his/her studies at another programme at KTH or another university in Sweden or abroad or start his/her work career.

Degree programme, in Chemical Science and Engineering, International Profile
Study year 1-3
The syllabus for the MSc program in Chemical Sciences with an international profile consists of mandatory courses in study year 1-3 (as above) as well as courses in their chosen language direction. Year 3 ends with a degree project, first level, for Degree of Bachelor of Science.

Study year 4-5
The students is offered the opportunity to spend a study year abroad at one of the KTH partner universities in the chosen language. These futures are located in the part of the training offered at the advanced level.

During study year 4 students who studies one of the European languages: French, Spanish or German is offered the possibility of locating the studies abroad. Courses equivalent to at least 45 credits in chemistry science at the advanced level should be read in study year 4-5.

During study year 5 students who studies Japanese or Chinese is offered the possibility of locating the studies abroad in Japan or China. Courses equivalent to at least 45 credits in chemistry science at the advanced level should be read in study year 4-5.

The program ends in the spring term in study year 5 with a degree project, second level, at 30 credits. Those who studies Japanese and Chinese are doing their degree project, advanced level, during the stay abroad.

Conditions for study abroad for students at the Chemical Science, International Profile
For admission to Chemical Science, International profile, must meet the following requirements in order to study abroad at one of the KTH partner universities:

- meet KTH advancement requirements (see more info under "Conditions of participation in education")

- all the courses in their chosen language as part of the program should be completed.

For exchange students in Japan and China there will also be a grade selection for the KTH partner universities.

The international profile is special because language courses will be given already from the start at study year 1. A total of 60 credits within the language Japanese or Chinese, is mandatory within the chosen language. The European languages consists of courses at a total of 45 credits in one of the languages of French, Spanish or German.
A study year for KTH's basic education is 40 weeks divided into four study periods. Each study period have about seven weeks. Each study period is followed by an exam period.

For detailed academic division see KTH student web and the KTH-Handbook.

**Courses**

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

The programme consists of compulsory, conditionally elective and optional courses. The compulsory courses are defined for every study year in the teaching and time schedule. The different courses goals, prerequisites, contents and examination requirements can be found in the respective course plans.

Only under certain circumstances can optional courses be taken earlier than year three.

Optional courses can be chosen from KTH’s course selection for Master of Science in Engineering programmes. Even courses from other universities/higher education institutions can be recognized for credit, if the degree requirements are fulfilled.

For optional courses, the following restrictions apply:

- Optional courses can not be taken in study year 1
- Only under certain circumstances can optional courses be taken earlier than in study year three.
- The number of higher education credits which can be taken per term can be limited.

**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.

**Conditions for participation in the programme**

*Enrolment notification and term registration*

Before every term, a term enrolment must be submitted via the study advisor at the programme office for Chemical Engineering, CHE students office.

Your enrolment notification constitutes the foundation for the office’s planning and that you are registered for the programme. Term registration is required in order for you study results to be registered and for CSN to distribute student aid.

**Temporary Postponement**

Temporary postponement means that the student does not participate in the programme during at least one study period. If temporary postponement is approved, the student has the right to return to the studies at a pre-determined point in time. During the temporary postponement, the student is able to complete and participate in examinations in incomplete courses.
Notification of temporary postponement is done on a form which is submitted to the students office which processes it. When the student intends to resume the studies, it is necessary for the student to submit a separate notification.

**Course Selection**

**Application to courses**
The student is responsible from study year 1 and on to apply to compulsory, conditionally elective and optional courses which are included in the programme which he/she is studying. Application for admission to courses will be made at:

- 1th-15th of May for the fall term
- 1th-15th of November for the spring term.

Students will be informed about how an application for admission to courses shall be done by the students office. Applications which are submitted after the deadline are only taken into consideration with regards to space considerations. Before course selection of language courses, a test must be taken to determine the appropriate level study.

**Course registration**
Registration of a course requires that the course has been selected in Ladok. The course selection is done whether via the course selection routine on the web, or via the CHE students office. Registration of a course is done by the course’s department.

The student must, at the first scheduled lecture, register him/herself in the course. Course registration in both compulsory and optional courses must be done individually (at the department). If the student registers a course and then decides to not continue with the course, then the student must notify the corresponding department as soon as possible.

**Conditions for being promoted to the next level**
The following promotion requirements apply in order to participate in the next level of the education.

**Requirements for promotion from study year 1 to study year 2:**
A total of at least 45 higher education credits from study year 1 to be completed.

**Requirements for promotion from study year 2 to study year 3:**
A total of at least 90 higher education credits from study years 1 and 2 must be completed at least 50 higher education credits from study year 1.

**Requirements for promotion from study year 3 to study year 1 at a Masters Programme:**
A total of at least 150 higher education credits from study years 1-3 must be completed, and at least 110 higher education credits from study year 1-2, and a degree project, first level.

**Requirements for promotion from study year 1 at a Masters Programme to study year 2:**
In addition to what applies for promotion to grade 4, at least 45 higher education credits from study year 4 must be completed.
Students who have not fulfilled the above requirements must consult with their study advisor to construct an individual study plan for the continuation of studies.

**Choice of Masters Program**  
Study year 3, the students applies for a Masters programme he/she intends to follow during the last 2 study years.

*For more information about the Masters programme given within the degree programme, in Chemical Science and Engineering, see descriptions in appendix 2, and programme plans for the masters programme.*

**Admission for Masters programme**  
Before the fall term starts, year 2014, the student must have achieved following to start a Masters programme.

- **Requirements for promotion from grade 3 to grade 4, Masters programme:**  
  A total of at least 150 higher education credits from study years 1-3 must be completed, and at least 110 higher education credits from study year 1-2, and a degree project, first level, for a degree of bachelor of science.

Students who have not fulfilled the above requirements must consult with their study advisor to construct an individual study plan for the continuation of studies.

**Recognition of previous academic studies**  
Students have the opportunity to apply for recognition of their results from the course or courses at another college / university within or outside the country. The form is available on the KTH website.  
The application for accreditation submitted to the study advisor at the CHE students office.

The complete KTH policy for recognition of previous academic studies is found in the KTH-handbook.


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

**Studies abroad**  
Students at the Degree programme, in Chemical Science and Engineering have the opportunity to study one or two semesters abroad through agreements KTH has with universities within and outside the EU. Exchange studies is appropriate in the fourth or fifth grade. It is also possible to make the thesis abroad.

For more information contact the international coordinator at CHE students office.

**Degree project**
**Degree project, first level**
In the programme a project work is done in grades 3, a thesis for a Degree of Bachelor of Science which is a course of 15 higher education credits.

Admission to start a degree project, first level, at least 120 higher education credits.

KTH comprehensive rules and guidelines for thesis 15 higher education credits for Degree of Bachelor of Science 180 higher education credits, and grading of the thesis is in the KTH-Study Handbook.

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examensarbete/1.27211

**Degree project, advanced level**
In the programme a project work is done, a thesis for the Degree of Master of Science in Engineering /Degree of Master of Science (Two Years) which is a course of 30 higher education credits.

Admission to start a degree project, advanced level, at least 240 higher education credits.

KTH comprehensive rules and guidelines for thesis 30 higher education credits for Degree of Master of Science in Engineering, Degree Programme in Chemical Science and Engineering 300 higher education credits, and grading of the thesis is in the KTH-Study Handbook.

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examensarbete/1.27205

**Degree project at advanced level for the Degree of Master of Science in Engineering, Chemical Science and Engineering, can be completed in exam working topics:**
Chemistry, Chemical Engineering and Fibre and Polymer Technology.

Other degree project topics may be considered upon application. For more information, contact the study advisor at the CHE students office.

It is the responsibility of the student to find a suitable project task.

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**Degree**

**Application for graduation**
Students have the opportunity to apply for the following degrees: Degree of Bachelor of Science and Degree of Master of Science in Engineering, Degree Programme in Chemical Science and Engineering. Students are also able to request for Degree of Master of Science (Two Years) of the requirements of this qualification is met.

Instructions for application for examination is made available on the KTH student web.

**Conditions for the Degree of Bachelor of Science 180 higher education credits**
The Degree of Bachelor of Science is received if the student applies for graduation after the completion of the grade 3 and fulfills the national degree requirements and complete all courses within the program corresponding to 180 higher education credits, of which
 mathematical-natural scientific courses of at least 25 higher education credits,
at least 90 higher education credits (including 15 higher education credits of degree project work)
with the gradual deepening of the main field of education.

**Degree Name**
Teknologie kandidatexamen
Degree of Bachelor of Science

**Conditions for the Degree of Master of Science in Engineering 300 higher education credits**
The Master of Science in Engineering degree is received after completing the programme. The programme
is formed so that the student fulfills the national degree requirements and has completed courses
corresponding to 300 higher education credits, of which

- mathematical-natural scientific courses of at least 45 higher education credits, and, in addition, at
  least 180 higher education credits (including 30 higher education credits of degree project work) in
  the subjects central to the technical area
- at least 90 higher education credits in the second level, whereof at least 60 higher education credits
  (including 30 higher education credits of degree project work) in the subjects central to the technical
  area

**Degree Name**
Civilingenjörsexamen
Degree of Master of Science in Engineering, Degree Programme in Chemical Science and Engineering

**Conditions for Degree of Master of Science (Two Years) 300 higher education credits.**
Degree of Master of Science (Two Years) is received after completing the programme. The programme is
formed so that the student fulfills the national degree requirements and has completed courses
corresponding to 120 higher education credits, of which

- at least 90 higher education credits in the second level, whereof at least 60 higher education credits
  (including 30 higher education credits of degree project work) in the subjects central to the technical
  area

**Degree Name**
Master of Science (120 credits)
Teknologie masterexamen

**Reference to KTH guidelines (KTH-Handbook)**
Local degree ordinance for degrees at first level and advanced level.

http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/examina/1.27227

**Appendix 1 - Course list**
**Appendix 2 - Programme syllabus descriptions**
Appendix 1: Course list

Degree Programme in Chemical Science and Engineering (CKEMV), Programme syllabus for studies starting in autumn 2011

General courses

Year 1

Mandatory courses (61.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>KD1020</td>
<td>Introductory Chemistry</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>KD1090</td>
<td>Organic Chemistry 1</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>KD1200</td>
<td>Chemical Equilibria</td>
<td>7.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>KE1050</td>
<td>Introduction to Chemical Engineering</td>
<td>12.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1624</td>
<td>Algebra and Geometry</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1625</td>
<td>Calculus in One Variable</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1626</td>
<td>Calculus in Several Variable</td>
<td>7.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SG1102</td>
<td>Mechanics, Smaller Course</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>KE1110</td>
<td>Introductory Course in Chemistry</td>
<td>1.5 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>SF1611</td>
<td>Introductory Course in Mathematics I</td>
<td>1.5 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Study year 1 consists of mandatory courses.

The optional course KE1040 Oral and Written Presentation for Chemists can be integrated with mandatory chemical and chemical engineering courses. The course will be given over 3 years, with start, study year 1.
Year 2

Mandatory courses (60.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN1212</td>
<td>Numerical Methods and Basic Programming</td>
<td>9.0 hp  First cycle</td>
</tr>
<tr>
<td>KD1040</td>
<td>Chemical Thermodynamics</td>
<td>7.5 hp  First cycle</td>
</tr>
<tr>
<td>KD1070</td>
<td>Molecular Structure</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>KD1080</td>
<td>Chemical Dynamics</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>KD1100</td>
<td>Organic Chemistry 2</td>
<td>7.5 hp  First cycle</td>
</tr>
<tr>
<td>KE1030</td>
<td>Transport Phenomena and Engineering Thermodynamics</td>
<td>10.5 hp First cycle</td>
</tr>
<tr>
<td>SF1633</td>
<td>Differential Equations I</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>SK1111</td>
<td>Electromagnetism and Waves</td>
<td>7.5 hp  First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Study year 2 consists of mandatory courses.

Year 3

Mandatory courses (60.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB1050</td>
<td>Biotechnology</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>KA101X</td>
<td>Degree Project in Chemical Science and Engineering, First Cycle</td>
<td>15.0 hp First cycle</td>
</tr>
<tr>
<td>KD1130</td>
<td>Inorganic Chemistry</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>KD1190</td>
<td>Chemical Measuring Techniques</td>
<td>9.0 hp  First cycle</td>
</tr>
<tr>
<td>KE1020</td>
<td>Reaction and Separation Engineering</td>
<td>10.5 hp First cycle</td>
</tr>
<tr>
<td>KE1130</td>
<td>Technology for Sustainable Development</td>
<td>6.0 hp  First cycle</td>
</tr>
<tr>
<td>KF1010</td>
<td>Polymer Technology with Cellulose Technology</td>
<td>7.5 hp  First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Study year 3 consists of mandatory courses and ends with a degree project, first level.

Year 4

Supplementary information
During study year 4 and 5 one of the three Masters programme should be taken:

*Chemical Engineering for Energy and the Environment*
*Macromolecular Materials*
*Molecular Science and Engineering*

For more detailed information about the programme, see:

- Master (Two years) - Chemical Engineering for Energy and the Environment, see http://www.kth.se/student/kurser/program/tkemm/?l=en_UK
- Master (Two years) - Macromolecular Materials, see http://www.kth.se/student/kurser/program/tmmmm/?l=en_UK
- Master (Two years) - Molecular Science and Engineering, see http://www.kth.se/student/kurser/program/tmvtm/?l=en_UK

**Year 5**

Supplementary information

During study year 4 and 5 one of the three Masters programme should be taken:

*Chemical Engineering for Energy and the Environment*
*Macromolecular Materials*
*Molecular Science and Engineering*

Study year 5 ends with a degree project, second level, 30 credits.

**Master, Chemical Science and Engineering (KEM)**

**Year 4**

Supplementary information

For more detailed information about the Master programme (Two Years), Chemical Engineering for Energy and Environment, see link below

http://www.kth.se/student/kurser/program/tkemm/?l=en_UK

**International Profile (KINT)**

**Year 1**

Mandatory courses (22.5 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1323</td>
<td>German, Advanced Beginners Level</td>
<td>7.5 hp First cycle</td>
</tr>
<tr>
<td>DS1339</td>
<td>French, Advanced Beginners Level</td>
<td>7.5 hp First cycle</td>
</tr>
</tbody>
</table>
Supplementary information

Those students who study the international profile will study the mandatory courses, study year 1 with the other students at the Degree programme in Chemical Science and Engineering.

The student will study one of the language courses below, in the selected language.

Year 2

Mandatory courses (27.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1324</td>
<td>Technical German, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS1334</td>
<td>Technical French, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
<tr>
<td>DS1348</td>
<td>Technical Spanish, Intermediate Level</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Those students who study the international profile will study the mandatory courses, study year 2 with the other students at the Degree programme in Chemical Science and Engineering.

The student will study one of the language courses below, in the selected language.

Year 3

Mandatory courses (27.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS2326</td>
<td>German B2</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>LS2336</td>
<td>French B2</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>LS2349</td>
<td>Spanish B2</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Those students who study the international profile will study the mandatory courses, study year 3 with the other students at the Degree programme in Chemical Science and Engineering.

The student will study one of the language courses below, in the selected language.

International Profile, Japanese (KJAP)

Year 1
### Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1381</td>
<td>Elementary Japanese and Japanese Studies</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

Those students who study the international profile japanese will study the mandatory courses, study year 1 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the japanese language course below.

### Year 2

### Mandatory courses (6.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>DS1383</td>
<td>Japanese, Advanced Beginners Level I</td>
<td>6.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

Those students who study the international profile japanese will study the mandatory courses, study year 2 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the japanese language course below.

### Year 3

### Mandatory courses (9.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS1385</td>
<td>Japanese A2</td>
<td>9.0 hp</td>
<td>First cycle</td>
</tr>
</tbody>
</table>

**Supplementary information**

Those students who study the international profile japanese will study the mandatory courses, study year 3 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the japanese language course below.

### Year 4

### Mandatory courses (9.0 Credits)
Course code | Course name | Credits | Edu. level
---|---|---|---
LS1386 | Japanese B1 | 9.0 hp | First cycle

**Supplementary information**

Those students who study the international profile japanese will study the mandatory courses at the selected Masters Programme, study year 4 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the japanese language course below.

**International Profile, Chinese (KKIN)**

**Year 1**

**Mandatory courses (6.0 Credits)**

Course code | Course name | Credits | Edu. level
---|---|---|---
DS1391 | Elementary Chinese and Chinese Studies | 6.0 hp | First cycle

**Supplementary information**

Those students who study the international profile in chinese will study the mandatory courses, study year 1 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the chinese language course below.

**Year 2**

**Mandatory courses (6.0 Credits)**

Course code | Course name | Credits | Edu. level
---|---|---|---
DS1393 | Chinese, Advanced Beginners Level I | 6.0 hp | First cycle

**Supplementary information**

Those students who study the international profile in chinese will study the mandatory courses, study year 2 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the chinese language course below.

**Year 3**

**Mandatory courses (9.0 Credits)**
Supplementary information

Those students who study the international profile in Chinese will study the mandatory courses, study year 3 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the Chinese language course below.

Year 4

Mandatory courses (9.0 Credits)

Supplementary information

Those students who study the international profile Chinese will study the mandatory courses at the selected Masters Programme, study year 4 with the other students at the Degree programme in Chemical Science and Engineering.

The students will also study the Japanese language course below.

Master, Macromolecular Materials (MMM)

Year 4

Supplementary information

For more detailed information about the Master programme (Two Years), Macromolecular Materials, see link below

http://www.kth.se/student/kurser/program/tmmmm/?l=en_UK

Master, Molecular Science and Engineering (MVT2)

Year 4

Supplementary information

For more detailed information about the Master programme (Two Years), Molecular Science and Engineering, see link below
http://www.kth.se/student/kurser/program/tmvtn/?l=en_UK
Appendix 2: Specialisations

Degree Programme in Chemical Science and Engineering (CKEMV), Programme syllabus for studies starting in autumn 2011

Master, Chemical Science and Engineering (KEM)

For more detailed information about the Master programme (Two Years), Chemical Engineering for Energy and Environment, see link below

http://www.kth.se/student/kurser/program/tkemm/?l=en_UK

International Profile (KINT)

International Profile, Japanese (KJAP)

International Profile, Chinese (KKIN)

Master, Macromolecular Materials (MMM)

For more detailed information about the Master programme (Two Years), Macromolecular Materials, see link below

http://www.kth.se/student/kurser/program/tmmmm/?l=en_UK

Master, Molecular Science and Engineering (MVT2)

For more detailed information about the Master programme (Two Years), Molecular Science and Engineering, see link below

http://www.kth.se/student/kurser/program/tmvtm/?l=en_UK