



# Programme syllabus

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

## Degree Programme in Computer Science and Engineering 300 credits

Civilingenjörsutbildning i datateknik

*Valid for students admitted to the education from autumn 17 (HT - Autumn term; VT - Spring term).*

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

### Programme objectives

The Engineering programme in Computer Science at KTH aims to give students opportunities and ability to participate in and lead the work on valuation, development and introduction of new computer technology.

### Knowledge and understanding

The programme has the goal that a Master of Computer Science and Engineering should:

- have fundamental knowledge within Computer Science and Engineering

- have profound knowledge in mathematics, i.e. have the ability to explain and carry out mathematical reasoning and define and analyse mathematical models.
- have knowledge in human- and natural sciences, especially such knowledge which has consequences for design of computerized systems.
- have knowledge about industrial entrepreneurship and relevant legislation.

## Skills and abilities

The programme has the goal that a Master of Computer Science and Engineering should:

- have prerequisites and abilities to participate in and develop the practices which are applied in industry, administration, and academic research.
- have the ability to independently define and solve computer-related construction problems.
- have the prerequisites for successful work in international and multidisciplinary project groups which consist of people from both technical and non-technical backgrounds. This includes the ability to orally, and in writing, present as well as argue in Swedish and English.

## Ability to make judgements and adopt a standpoint

The programme has the goal that a Master of Computer Science and Engineering should:

- Independently analyse and adopt a standpoint on economical, societal, environment-related and ethical consequences of computer science applications, and to design systems concerning this.
- Through self-development, retain one's professional abilities during a professional career.
- Follow and promote the discussion concerning technology in society.

## Extent and content of the programme

The Master of Computer Science and Engineering is composed of 300 ECTS credits, which, at normal study rate, corresponds to 5 years of full-time study (10 semesters).

The first three years (180 ECTS credits) are on undergraduate level.

The final two years (120 ECTS credits) the student follow a master programme. The master's programmes consist of courses mainly on advanced level. The education leads to a master's degree as well as a "civilingenjör" degree.

### ***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 are taught in English.

# Eligibility and selection

For eligibility requirements and selection, see the KTH admission policy, [www.kth.se](http://www.kth.se)

## Implementation of the education

### Structure of the education

#### Structure of the education

This programme syllabus decided by the CSC Dean 2016-09-15 is valid for students starting the programme during the study year 2017/2018. Which courses that belong to specific study year is decided in the fall the year before. Please see "Study year 1" etc. or the appendices. Changes may occur in the contents of the programme and in the KTH regulations, please see [www.kth.se/en/](http://www.kth.se/en/).

The syllabus for the Master of Computer Science and Engineering programme consists of

- compulsory first level courses during study years 1–3 concluded by a degree project at undergraduate level.
- courses within the master's programme that the student has chosen for study years 4–5, concluded by a degree project at graduate level.
- elective courses at undergraduate and graduate level giving the education the profile desired by the student.

#### International profile

The international profile starts in study year 2 and includes courses in the profile language and a possibility to spend one or two semesters at one of the KTH partner universities using the language of the profile. Currently the following profile languages are offered: Japanese, Chinese, French, German, and Spanish. Information about application, possible changes to the curriculum and the requirements to achieve an international profile is given during the spring semester of study year 1.

#### Language engineering profile

The specialisation in Language Engineering begins in the fall semester in study year 2. Information about application, possible changes to the curriculum is given during the spring semester of study year 1.

#### Bachelor's degree

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

## Academic year

The KTH academic year is 40 weeks, divided into four periods.

For details about the structure of the academic year see <http://www.kth.se/en/>

## Courses

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

The course goals, prerequisites, contents and examination requirements are found in the course syllabus in the Course and programme directory on the KTH student web. The programme consists of compulsory, conditionally elective and elective courses. The compulsory courses are defined in course lists for each study year.

Elective courses can be chosen from KTH's course selection for Master of Science in Engineering programmes. Courses from other universities can be recognized for credit, if the degree requirements are fulfilled.

For elective courses, the following restrictions apply:

- Elective courses can not be taken in study year 1
- Only in exceptional cases can elective courses be taken in study year 2
- The number of credits that can be chosen per semester can be limited.
- Elective courses may not overlap a course already taken to a considerable extent.
- Higher education preparation courses may not be counted as elective course.
- Courses on lower levels within a subject than the programme courses may not count as elective courses.

## 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.

Since the grading systems differ very much between different countries, the grades are not translated from exchange studies abroad.

## Conditions for participation in the programme

### *Semester enrollment*

At the start of each semester the student is required to make a study enrollment for the next semester at the Personal menu at [www.kth.se](http://www.kth.se)

The study enrollment is required for taking new courses and for study results to be registered.

### ***Selection of courses***

Application to the course is done:

- 1 to 15 May for the autumn semester
- 1 to 15 November for the spring semester

with student [kth.se](http://kth.se) account via [universityadmissions.se](http://universityadmissions.se)

If the student does not do their course selections by this system his/her application is only considered upon availability. Applications to language courses with prerequisites should be preceded by a qualification test.

In a few courses, the number of participants is limited. Selection is done by the school responsible for the course.

A student may only take courses that are included in the study plan.

### ***Choice of master's programme***

The student must apply for the master's programme he/she wishes to follow during study years 4–5 according to instructions given by the CSC education administration office.

### ***Course registration***

The student must, at course start, register for each course. Course registration for compulsory as well as elective courses must be done individually. If the student registers for a course and then decides to not continue, the student must remove the registration via the personal menu.

Registration to a course requires formal acceptance to the course.

### ***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 credits from study year 1 must be completed.

#### ***Requirements for promotion from study year 2 to study year 3:***

A total of at least 90 credits from study years 1 and 2 must be completed whereof at least 50 credits from study year 1.

***Requirements for promotion from study year 3 to study year 4:***

A total of at least 150 credits from study years 1-3 must be completed whereof 110 credits from study year 1-2, and the first level degree project must be completed

***Requirements for promotion from study year 4 to study year 5:***

In addition to what applies for promotion to study 4, at least 45 higher education credits from study year 4 must be completed.

***Individual study plan***

Students who do not fulfil these requirements must – in cooperation with the CSC educational administration office – make an individual study plan for continued studies.

Please see the KTH regulations: <http://www.kth.se/en/>

## Recognition of previous academic studies

Studies at another university can be transferred. An application form can be found on the KTH Student pages.

The application form is submitted to the CSC education administration office.

KTH's policy for recognition of previous academic studies are entirely in the KTH regulations

<http://www.kth.se/en>

## Studies abroad

Students at the Master of Science in Engineering in Computer Science and Engineering programme have the opportunity to study one or two semesters abroad through agreements KTH has with universities within and outside the EU. Exchange studies are not appropriate during the first and second study years. It is also possible to make the final degree project (second cycle) abroad.

For more information contact the international coordinator at CSC.

More information is found on the KTH student web and at:

<http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/utbytesstudier>

## Degree project

***Degree project, undergraduate level***

A degree project of 15 ECTS credits at undergraduate level is done during study year 3.

KTH comprehensive rules and guidelines for degree projects of 15 ECTS credits for Degree of Bachelor of Science 180 ECTS credits, and grading of the project are found in the KTH regulations.

<http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/examensarbete/>

### ***Degree project, graduate level***

A second degree project of 30 ECTS credits (second cycle) is done during study year 5.

KTH comprehensive rules and guidelines for degree projects of 30 ECTS credits for Degree of Master of Science in Engineering, Degree Programme in Computer Science and Technology 300 ECTS credits, and grading of the project is found in the KTH regulations.

<http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/examensarbete/>

### ***In addition the following applies:***

For a student who within the selected Master program does a degree project examined by any other school than CSC, the program director for the Master of science of engineering program in Computer Science and Engineering must approve the specification and the final report to certify the relevance of the degree project in relation to the program.

## **Degree**

### ***Application for graduation***

Students may apply for the following degrees: Degree of Bachelor of Science and Degree of Master of Science in Engineering, Degree Programme in Computer Science. Students can also request for Degree of Master of Science (Two Years) if the requirements for this degree are met.

Instructions for the application are available on the KTH student web.

### ***Conditions for the Degree of Bachelor of Science 180 ECTS credits***

The Degree of Bachelor of Science is received if the student applies for graduation after the completion of the 3rd study year and fulfils the national degree requirements, i.e. has completed courses corresponding to 180 ECTS credits, including

- Mathematics/natural science subjects carry at least 25 credits;
- At least 90 credits are (including a 15-credit degree project) with increasingly in-depth studies in the main field of study.

### ***Degree name***

Teknologie kandidatexamen  
Degree of Bachelor of Science

***Conditions for the Degree of Master of Science in Engineering 300 ECTS credits***

The Master of Science in Engineering degree is received after completing the programme. The programme is designed so that the student fulfills the national degree requirements and has completed courses corresponding to 300 ECTS credits, including

- Mathematics/natural science subjects must carry at least 45 credits, and in addition at least 180 credits (including a 30-credit degree project) must be within the framework of the engineering area;
- At least 90 credits at second level, of which at least 60 credits (including a 30-credit degree project) must be within the framework of the engineering area.

***Degree name***

Civilingenjörsexamen

Degree of Master of Science in Engineering, Degree Programme in Computer Science and Technology

***Conditions for Degree of Master of Science (Two Years) 120 ECTS credits.***

***See KTH regulations (see link below).***

***Degree name***

Teknologie masterexamen

Degree of Master of Science (Two Years)

***Information on degree requirements in the KTH regulations:***

<http://www.kth.se/en/>

Appendix 1 - Course list

Appendix 2 - Programme syllabus descriptions





# Appendix 1: Course list

## Degree Programme in Computer Science and Engineering (CDATE)

### General courses

#### Year 1

#### Mandatory courses (64.0 Credits)

| Code                   | Name  | Credits | Edu. level  |
|------------------------|---|---------|-------------|
| <a href="#">DA1600</a> | Writing in the Engineering Profession   | 4.5 hp  | First cycle |
| <a href="#">DD1337</a> | Programming   | 7.0 hp  | First cycle |
| <a href="#">DD1338</a> | Algorithms and Data Structures  | 6.0 hp  | First cycle |
| <a href="#">DD1349</a> | Project in Introduction to Computer Science   | 3.0 hp  | First cycle |
| <a href="#">DD1390</a> | Programme Integrating Course in Computer Science Engineering<br><i>2 cr belong to study year 1; distribution over the periods: 0,1; 1,5; 0,2; 0,2</i> | 6.0 hp  | First cycle |
| <a href="#">DD1396</a> | Parallel and Concurrent Programming in Introduction to Computer Science   | 3.0 hp  | First cycle |
| <a href="#">DH1620</a> | Human-Computer Interaction, Introductory Course   | 6.0 hp  | First cycle |
| <a href="#">SF1547</a> | Numerical Methods, Basic Course   | 6.0 hp  | First cycle |
| <a href="#">SF1624</a> | Algebra and Geometry  | 7.5 hp  | First cycle |
| <a href="#">SF1625</a> | Calculus in One Variable  | 7.5 hp  | First cycle |
| <a href="#">SF1671</a> | Mathematics, Basic course, with Discrete Mathematics  | 7.5 hp  | First cycle |

## Supplementary information

The introductory course in mathematics can not be included in the degree.

### Year 2

#### Mandatory courses (57.0 Credits)

| Code                   | Name   | Credits | Edu. level  |
|------------------------|--|---------|-------------|
| <a href="#">DD1351</a> | Logic for Computer Scientists  | 7.5 hp  | First cycle |
| <a href="#">DD1362</a> | Programming Paradigms  | 6.0 hp  | First cycle |
| <a href="#">DD1368</a> | Database Technology  | 6.0 hp  | First cycle |
| <a href="#">DD1390</a> | Programme Integrating Course in Computer Science Engineering<br><i>Three credits in year 2</i> | 6.0 hp  | First cycle |
| <a href="#">DD1393</a> | Software Engineering   | 10.5 hp | First cycle |
| <a href="#">IS1500</a> | Computer Organization and Components   | 9.0 hp  | First cycle |
| <a href="#">ME1010</a> | Organization and Knowledge-Intensive Work  | 6.0 hp  | First cycle |
| <a href="#">SF1924</a> | Probability Theory and Statistics  | 6.0 hp  | First cycle |

#### Conditionally elective courses

| Code                   | Name  | Credits | Edu. level  |
|------------------------|---|---------|-------------|
| <a href="#">DD1354</a> | Models and Simulation<br><i>Either DD1354 or SF1626 must be taken</i>         | 6.0 hp  | First cycle |
| <a href="#">SF1626</a> | Calculus in Several Variables<br><i>Either DD1354 or SF1626 must be taken</i> | 7.5 hp  | First cycle |

## Supplementary information

Subject to changes

## Year 3

### Mandatory courses (50.0 Credits)

| Code                   | Name  | Credits | Edu. level   |
|------------------------|---|---------|--------------|
| <a href="#">AL1504</a> | Sustainable Development for Computer Science and Engineering                                | 7.5 hp  | First cycle  |
| <a href="#">DD1390</a> | Programme Integrating Course in Computer Science Engineering<br><i>One credit in year 3</i> | 6.0 hp  | First cycle  |
| <a href="#">DD142X</a> | Degree Project in Computer Science, First Cycle   | 15.0 hp | First cycle  |
| <a href="#">DD2350</a> | Algorithms, Data Structures and Complexity  | 9.5 hp  | Second cycle |
| <a href="#">ID1200</a> | Operating Systems   | 6.0 hp  | First cycle  |
| <a href="#">SF1688</a> | Discrete Mathematics  | 6.0 hp  | First cycle  |

### Supplementary information

Subject to changes.



# Appendix 2: Specialisations

## Degree Programme in Computer Science and Engineering (CDATE)

This programme has no specialisations.