



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 14 (HT - Autumn term; VT - Spring term).

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

Programme objectives

This programme syllabus, decided by the CSC dean 2013-09-27 is valid for students starting the programme during the study year 2014/2015. Which courses that belong a 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/student.

Computer Science and Engineering is the most influential factor on society and will remain so during the foreseeable future. An essential usage of Computer Science and Engineering is the efficiency of resource usage and communication in society for a sustainable development.

The Master of Science in Computer Science and Engineering programme at KTH aims to give the student the prerequisites and abilities to participate in and lead work with appraisal, development and influence of new Computer Science and Engineering technologies.

Besides the goals stated in the Swedish Higher Education Ordinance the following goals apply.

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.

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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 the first level. The first three years (180 ECTS credits) are on the first level. The final two years (120 ECTS credits) are mainly on the second level.

Master's programmes

The last two years the student takes a master's programme of his/her choice. The master's programmes consist of courses mainly in the second level. The education leads to a master's degree as well as a "civilingenjör" degree.

Each year a list of master's programmes that the students can choose from is presented. For some master's programmes there are restrictions as to choice of tracks or eligible courses.

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 mostly in English. For each course the language of instruction is found in the Course and programme directory on the KTH student web site.

Eligibility and selection

In order to be accepted to the Master of Computer Science and Engineering programme the basic eligibility requirements as well as the following requirements must be met: Mathematics E, Physics B, Chemistry A (according to the Swedish school system). All with at least a grade of Godkänd (Passed).

For eligibility requirements and selection, see the KTH admission policy

<http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/antagning/1.276066>

Implementation of the education

Structure of the education

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This programme syllabus decided by the CSC dean 2013-09-27 is valid for students starting the programme during the study year 2014/2015. Which courses that belong a 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/student.

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 first level degree project.
- courses within the master's programme that the student has chosen for study years 4–5, concluded by a second level degree project.
- elective first and second level courses 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.

Specialization in language engineering

The specialisation in Language Engineering begins in the fall semester in study year 2 with courses in linguistics taken at Stockholm University. These courses replace some of the compulsory courses. (See appendix 2)

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/student/schema/>

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 My pages.

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

Selection of courses

Admission to compulsory courses during study years 1–2 is currently automatic. Students choosing among alternative compulsory courses have to submit a special form.

From study year 3 and on the student is responsible for applying to all courses he/she wishes to take. This also applies to compulsory courses. The application for admission to a course is done according to instructions from the CSC school no later than

- May 15th for the fall semester
- November 15th for the spring semester

Applications made after this date are only granted if there are vacancies in the courses. 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 programme 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 report this as soon as possible.

Registration to a course requires formal acceptance to the course (by the school responsible for the course). Applications should be done according to instructions from the CSC school.

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 ECTS 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 ECTS credits from study years 1 and 2 must be completed whereof at least 50 higher education credits from study year 1.

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

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

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 programme office – make an individual study plan for continued studies.

Please see the KTH regulations: <http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/1.27217>

Recognition of previous academic studies

Credits for 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 programme office.

<http://intra.kth.se/en/regelverk/utbildning-forskning/grundutbildning/prestationer/1.27200>

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, first cycle

A degree project of 15 ECTS credits (first cycle) 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/1.27211>

Degree project, second cycle

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/1.27205>

In addition the following applies:

Not only the requirements set by the selected Master program to begin the degree project apply but also the following: The student must have 240 ECTS credits from completed courses within the Master of science of engineering program and may have at the most three unfinished compulsory courses from study years 1–3.

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

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
DD1339	Introduction to Computer Science	19.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering <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
DH1600	Communication in Engineering Sciences	7.5 hp	First cycle
DH1620	Human-Computer Interaction, Introductory Course	6.0 hp	First cycle
SF1547	Numerical Methods, Basic Course	6.0 hp	First cycle
SF1604	Linear Algebra	7.5 hp	First cycle
SF1625	Calculus in One Variable	7.5 hp	First cycle
SF1659	Mathematics, Basic Course	4.5 hp	First cycle

Year 2

Mandatory courses (63.0 Credits)

Code	Name	Credits	Edu. level
AG1814	Sustainable Development for Computer Science and Engineering	6.0 hp	First cycle
DD1350	Logic for Computer Science	6.0 hp	First cycle
DD1361	Programming Paradigms	7.5 hp	First cycle
DD1368	Database Technology	6.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering	6.0 hp	First cycle
DD1393	Software Engineering	10.5 hp	First cycle
IS1500	Computer Organization and Components	9.0 hp	First cycle
ME1010	Organization and Knowledge-Intensive Work	6.0 hp	First cycle
SF1901	Probability Theory and Statistics	6.0 hp	First cycle

Supplementary information

According to the study programme these courses are part of study year 2.

Year 3

Mandatory courses (45.0 Credits)

Code	Name	Credits	Edu. level
DD1352	Algorithms, Data Structures and Complexity	9.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering <i>One credit in year 3</i>	6.0 hp	First cycle
DD142X	Degree Project in Computer Science, First Cycle	15.0 hp	First cycle
ID2200	Operating Systems	6.0 hp	Second cycle
SF1630	Discrete Mathematics	9.0 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
DD1354	Models and Simulation <i>One of the courses DD1354 or SF1626 must be taken</i>	6.0 hp	First cycle
SF1626	Calculus in Several Variables <i>One of the courses DD1354 or SF1626 must be taken</i>	7.5 hp	First cycle

Recommended courses

Code	Name	Credits	Edu. level
DD1387	Program System Construction Using C++	6.0 hp	First cycle
DD1389	Internet Programming	6.0 hp	First cycle
DD2418	Language Engineering	6.0 hp	Second cycle
DD2471	Modern Database Systems and Their Applications	7.5 hp	Second cycle
DH2323	Computer Graphics and Interaction	6.0 hp	Second cycle
DH2642	Interaction Programming and the Dynamic Web	7.5 hp	Second cycle
DH2650	Computer Game Design	6.0 hp	Second cycle
DM2518	Mobile Development with Web Technologies	7.5 hp	Second cycle
DT1130	Spectral Transforms	7.5 hp	First cycle
EH2770	IT Management with Enterprise Architecture I	7.5 hp	Second cycle
EQ1110	Continuous Time Signals and Systems <i>Eligibility requirement for the master programme in wireless systems</i>	6.0 hp	First cycle
EQ1120	Discrete Time Signals and Systems <i>Eligibility requirement for the master programme in wireless systems</i>	6.0 hp	First cycle
ID2204	Constraint Programming	7.5 hp	Second cycle
ID2222	Data Mining	7.5 hp	Second cycle
IE1205	Digital Design <i>Eligibility requirement for the master programme in embedded systems, track embedded platforms</i>	6.0 hp	First cycle
IK1552	Internetworking <i>Eligibility requirement for the master programme in communication system</i>	7.5 hp	First cycle

ME1003	Industrial Management, Basic Course <i>Eligibility requirement for the master programme in industrial management</i>	6.0 hp	First cycle
ME2015	Project Management: Leadership and Control <i>Eligibility requirement for the master programme in industrial management</i>	6.0 hp	Second cycle
ME2063	Team Leadership and Human Resource Management <i>Eligibility requirement for the master programme in industrial management</i>	6.0 hp	Second cycle
MF1035	Electrical Engineering, Basic Course Media <i>Eligibility requirement for the master programme in medical engineering</i>	6.0 hp	First cycle
SF1634	Differential Equations II <i>Eligibility requirement for the master programme in Applied and Computational Mathematics</i>	9.0 hp	First cycle
SF1861	Optimization	6.0 hp	First cycle
SF1904	Markov Processes, Basic Course	3.0 hp	First cycle
SK180N	Introductory Modern Physics <i>Eligibility requirement for the master programme in medical engineering</i>	9.0 hp	First cycle

Supplementary information

Subject to changes

Language Technology (STEK)

Year 1

Supplementary information

Year 1 is read together with the Computer Science programme

Year 2

Mandatory courses (49.5 Credits)

Code	Name	Credits	Edu. level
DD1350	Logic for Computer Science	6.0 hp	First cycle
DD1368	Database Technology	6.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering <i>3 credits will be taken in year 2; 0,1 cr. in period 1; 0,4 cr. in period 2; 0,5 cr. in period 3 and 2 cr. in period 4.</i>	6.0 hp	First cycle
DD1393	Software Engineering	10.5 hp	First cycle
IS1500	Computer Organization and Components	9.0 hp	First cycle
ME1010	Organization and Knowledge-Intensive Work	6.0 hp	First cycle
SF1901	Probability Theory and Statistics	6.0 hp	First cycle

Supplementary information

In year 2 these courses are done at Stockholms university (SU):

- LIN131 Introduction to linguistics, 12 credits,
- LIN133 Linguistic Evolution, Development, and Variation, 7,5 credits.

These students shall take AG1814 and DD1361 in year 3 instead.

Year 3

Mandatory courses (52.5 Credits)

Code	Name	Credits	Edu. level
AG1814	Sustainable Development for Computer Science and Engineering	6.0 hp	First cycle
DD1352	Algorithms, Data Structures and Complexity	9.0 hp	First cycle
DD1361	Programming Paradigms	7.5 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering <i>1 cr belongs to study year 3; distribution over the periods: 0,1; 0,1; 0,2; 0,6</i>	6.0 hp	First cycle
DD143X	Degree Project in Computer Science, First Cycle	15.0 hp	First cycle
SF1630	Discrete Mathematics	9.0 hp	First cycle



Appendix 2: Specialisations

Degree Programme in Computer Science and
Engineering (CDATE)

Language Technology (STEK)

No information entered.