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 20 (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 corresponds to 5 years of full-time study (10 semesters). The first three years (180 ECTS credits) are on undergraduate level, and will be given in Swedish. The final two years (120 ECTS credits) will be given in English. Students in the Computer Science programme have a guaranteed place in the following master's programmes, but it can be changed. Note that there might be special course requirements for admission to some of the programmes.

- Computer Science
- Interactive Media Technology
- Software Engineering of Distributed Systems
- ICT Innovation
- Machine Learning

- Information and Network Engineering
- Systems, Controls and Robotics
- Communications Systems
- Embedded Systems
- Industrial Management
- Applied Computational Mathematics
- Medical Engineering

Eligibility and selection

General admission requirements and special admission requirements must be fulfilled in order to be admitted: Mathematics 4, Physics 2 and Chemistry 1, with the lowest grade E.

Selection is based on high school grades and results of the university examination, two thirds of the places are appointed on the basis of grades and one third on the basis of the university degree.

Implementation of the education

Structure of the education

Each academic year consists of two semesters which are 20 weeks each, and each semester is further divided into two study periods.

The syllabus for the Master of Computer Science and Engineering programme (300 ECTS) consists of

- mainly mandatory courses in study year 1–3 (180 ECTS), which concluded by a degree project at undergraduate level
- courses in study year 4-5 (120 ECTS), within the chosen master's programme, of which at least 60 credits must consist of courses in computer science at second cycle. The courses are mandatory, conditionally elective and elective. Year 5 is concluded by a degree project in second cycle.

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.

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.

Courses

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

Courses at KTH can be either mandatory, conditionally elective or elective.

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.

The grading scale is found in the course syllabus.

Conditions for participation in the programme

Participation requires admission and course registration for courses given within the programme.

For further studies, special admission requirements for the course are to be fulfilled. Special admission requirements are listed in the respective course syllabus.

Conditions for further studies
The student must apply in year 3 for the master's programme study years 4–5. In order to be eligible for advanced level studies within the integrated Master of Science programmes at KTH, you are required to complete 150 credits from year 1-3. Of these, 110 credits must be from the year 1-2 curriculum. In addition to these credits, the bachelor thesis needs to be completed before Master's level studies commence. Additional specific eligibility requirements may apply to certain programs and appear in the respective Education Plan.

Degree project

Within the programme there are requirements for two degree work courses, one in the first cycle in year 3 (15 credits) and one in year 5 within the second cycle (30 credits). The degree project is the final part of the education. The project work may begin when special admission requirements for the course are fulfilled.

Special conditions
For a student who does a degree project examined by any other school than EECS, the programme director for the Master of science of engineering programme in Computer Science and Engineering (CDATE) must approve the specification ***before*** the thesis can begin. The final report shall then also

be reviewed by the programme director for CDATE to certify the relevance of the degree project in relation to the programme.

Degree

The degree is entitled Degree of Master of Science in Engineering (Civilingenjörsexamen). The text on the degree certificate states the educational programme Computer Science.

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
DA1600	Writing in the Engineering Profession	4.5 hp	First cycle
DD1337	Programming	7.0 hp	First cycle
DD1338	Algorithms and Data Structures	6.0 hp	First cycle
DD1349	Project in Introduction to Computer Science	3.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering *Of which 2 credits belong to study year 1.*	6.0 hp	First cycle
DD1396	Parallel and Concurrent Programming in Introduction to Computer Science	3.0 hp	First cycle
DH1620	Human-Computer Interaction, Introductory Course	6.0 hp	First cycle
SF1547	Numerical Methods, Basic Course	6.0 hp	First cycle
SF1624	Algebra and Geometry	7.5 hp	First cycle
SF1625	Calculus in One Variable	7.5 hp	First cycle
SF1671	Mathematics, Basic course, with Discrete Mathematics	7.5 hp	First cycle

Year 2

Mandatory courses (57.0 Credits)

Code	Name	Credits	Edu. level
DD1351	Logic for Computer Scientists	7.5 hp	First cycle
DD1362	Programming Paradigms	6.0 hp	First cycle
DD1368	Database Technology	6.0 hp	First cycle
DD1369	Software Engineering in Project Form	10.5 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering *Of which 3 credits belong to study year 2.*	6.0 hp	First cycle
IS1500	Computer Organization and Components	9.0 hp	First cycle
ME1010	Organization and Knowledge-Intensive Work	6.0 hp	First cycle
SF1924	Probability Theory and Statistics	6.0 hp	First cycle

Conditionally elective courses

Code	Name	Credits	Edu. level
DD1354	Models and Simulation *At least one of DD1354 or SF1626 should be taken.*	6.0 hp	First cycle
SF1626	Calculus in Several Variables *At least one of DD1354 or SF1626 should be taken.*	7.5 hp	First cycle

Supplementary information

Information regarding conditionally elective courses

At least one of the two conditionally elective courses should be taken.

Year 3

Mandatory courses (50.0 Credits)

Code	Name	Credits	Edu. level
AL1504	Sustainable Development for Computer Science and Engineering	7.5 hp	First cycle
DA150X	Degree Project in Computer Science and Engineering, First Cycle	15.0 hp	First cycle
DD1390	Programme Integrating Course in Computer Science Engineering *Of which 1 credit belong to study year 3.*	6.0 hp	First cycle
DD2350	Algorithms, Data Structures and Complexity	9.5 hp	Second cycle
ID1200	Operating Systems	6.0 hp	First cycle
SF1688	Discrete Mathematics	6.0 hp	First cycle

Supplementary information

Year 4

Supplementary information

During study years 4-5 the students follow a master programme of their choice. The listed master programmes below will give a Degree of Master of Science in Engineering in Computer Science (but it can be changed). For admission to some of the programmes it can be special course requirements.

- Computer Science
- Interactive Media Technology
- Software Engineering of Distributed Systems
- ICT Innovation
- Machine Learning
- Information and Network Engineering
- Systems, Controls and Robotics
- Communications Systems
- Embedded Systems

- Industrial Management
- Applied Computational Mathematics
- Medical Engineering.

Year 5

Supplementary information

During study years 4-5 the students have to follow a master programme.

Appendix 2: Specialisations

Degree Programme in Computer Science and Engineering (CDATE)

This programme has no specialisations.