

Programme Syllabus

Master's Programme in Computer Science (120 credits)

**Masterprogram i datavetenskap
(120 högskolepoäng)**

Established by: Pro-Vice-Chancellor and the Deans

Date of establishment: 23 April 2020

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Programme code: DVACC

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Reg no: BTH-4.1.13-0556-2026

Applies to students admitted: autumn 2026

Part 1 — Description of the degree programme

Entry requirements

Admission to the degree programme requires:

Bachelor of Science or Bachelor of Science in Engineering in an aspect of computing, e.g.: computer science, software engineering, computer engineering is required. The bachelor's degree must include at least 45 credits in the following areas: Programming, Data structures and Algorithms, Database Technology, Data Communication, Operating Systems, whereof at least 15 credits in Programming. The degree must also include at least 15 credits in Mathematics. English 6.

Outcomes and content

The master's Programme in Computer Science is a two-year scientific education. Computer science is a broad field that includes subjects such as programming languages, algorithms and complexity, data structures, intelligent systems, distributed systems, and network technologies. The education focuses on aspects closely related to the research frontier in computer science.

The programme includes elective courses and thus provides opportunities for specialization in information security, parallel and distributed systems, and intelligent systems.

The education is concluded with a master's thesis, which should be based on current research and scientific literature and/or self-designed studies.

After the student has obtained his or her master's degree, he or she is well prepared for both work in the business world and research studies.

National outcomes

Knowledge and understanding

For a Degree of Master (120 credits) the student shall:

- demonstrate knowledge and understanding in the main field of study, including both broad knowledge of the field and a considerable degree of specialised knowledge in certain areas of the field as well as insight into current research and development work, and
- demonstrate specialised methodological knowledge in the main field of study.

Competence and skills

For a Degree of Master (120 credits) the student shall:

- demonstrate the ability to critically and systematically integrate knowledge and analyse, assess and deal with complex phenomena, issues and situations even with limited information,
- demonstrate the ability to identify and formulate issues critically, autonomously and creatively as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames and so contribute to the formation of knowledge as well as the ability to evaluate this work,
- demonstrate the ability in speech and writing both nationally and internationally to clearly report and discuss his or her conclusions and the knowledge and arguments on which they are based in dialogue with different audiences, and
- demonstrate the skills required for participation in research and development work or autonomous employment in some other qualified capacity.

Judgement and approach

For a Degree of Master (120 credits) the student shall:

- demonstrate the ability to make assessments in the main field of study informed by relevant disciplinary, social and ethical issues and also to demonstrate awareness of ethical aspects of research and development work,
- demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and
- demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.

Content

The education offers courses mainly at the second cycle level in computer science and related fields. The courses offered within the education include both practical software development and more investigative work, often with great personal responsibility for the students and with elements of group work in various forms.

The program consists mainly of elective courses, and it is up to the student to choose these to form a direction that suits the student's goals. Courses are offered with a focus on, among other things, security, AI/ML, networks, and interaction design.

At the end of the education, a course at the second-cycle level in computer science and communication is carried out, in which the student prepares for the master's thesis.

The student is responsible for ensuring that the number of compulsory and elective courses at the undergraduate level does not exceed 30 higher education credits. Students are continuously informed about this, but the individual students are responsible for not exceeding this limit through their choices.

The courses and their positions in the degree programme are presented in Part 2.

The degree programme undergoes continuous evaluation and development, which may result in changes in the range of courses offered.

Implementation and instruction/teaching

The education is conducted through lectures, exercises, seminars, and laboratory sessions. Depending on the nature of the laboratory assignments, these are performed independently or in groups.

The programme is an international programme, and students from many different countries participate. This, together with the fact that a large part of the teaching staff is international, promotes students' opportunity to develop an international perspective in education.

The degree programme is taught in English.

The university's perspectives

At the university, several perspectives are central - partly to strengthen the strategic focus and profile, and partly to meet the legal requirements that apply to education. At BTH, the perspectives of responsible academia, innovative development, and collaboration are integrated into all degree programmes. Programme managers and teachers work continuously to weave these perspectives into the content of the programmes.

Conditions for participation in programme courses

In order to participate in the courses of the degree programme, the student must be admitted and registered on the courses. In order to be admitted to compulsory or elective courses, the student must be eligible, i.e. meet the course's entry

requirements, no later than at the start of the course. Eligibility checks are carried out before each course starts.

The number of study places on elective courses within the programme may be limited. If there are too few applicants, an elective course may be cancelled.

Degree

In order to obtain the degree stated below it is required that the objectives for qualifications in accordance with the Higher Education Ordinance as well as the requirements stated in the Local Degree Ordinance have been met.

The programme leads up to the following second-cycle degree:

Degree of Master of Science (120 credits)
Main field of study: Computer Science

Part 2 — Course in the programme

Master's Programme in Computer Science (120 credits)

Admitted: autumn 2026

The name of the course	Course code	Credits	Autumn Sp1	Autumn Sp2	Spring Sp3	Spring Sp4
Education year 1						
Applied Artificial Intelligence Computer Science; Second cycle; A1N	DV2618	7.5	X			
Programming in UNIX Computer Science, Software Engineering; First cycle; G1F	DV1734	7.5	X			
Network and System Security, Computer Science, Electrical Engineering; Second cycle; A1N	DV2636	7.5		X		
Introduction to Cloud Computing Computer Science, Technology, First cycle; G2F	DV1566	7.5		X		
Research Methodology Computer Science, Electrical Engineering; Second cycle; A1F	DV2657	7.5			X	
One or more elective courses. See choices below.			-	-	-	-
Elective courses education year 1						
Usability and Interaction Design Computer Science; First cycle; G1F	DV1557	7.5			X	
Secure Software Engineering Software Engineering, Computer Science; Second cycle; A1N	PA2562	7.5			X	
Advanced Networking Computer Science, Electrical Engineering; Second cycle; A1N	DV2601	7.5			X	
Decision Support System Computer Science; Second cycle; A1N	DV2573	7.5				X
Network and Service Operations Computer Science, Electrical Engineering; Second cycle; A1N	DV2602	7.5				X
Mathematical Statistics The course doesn't belong to any main field of study at BTH; First cycle; G1F	MS1411	7.5				X
Software Metrics Software Engineering; Second cycle; A1N	PA2559	7.5				X
Education year 2						
Sustainable development of information and communication technology Strategic Leadership towards Sustainability; Second cycle; A1N	SL2572	7.5	X			

Advanced Topic in Computing Computer Science, Software Engineering; Second cycle; A1N	DV2635	7.5		X		
Master's Thesis in Computer Science Computer Science; Second cycle; A2E	DV2572	30			X	X
One or more elective courses. See choices below.			-	-	-	-
Elective courses education year 2						
Malware Analysis Computer Science; Second cycle; A1N	DV2582	7.5	X			
Socket Programming in C/C++ for Internet Applications Computer Science; First cycle; G1F	DV1728	7.5	X			
Applied Cloud Computing and Big Data Software Engineering; Second cycle; A1N	PA2577	7.5	X			
Performance Optimization Computer Science, Software Engineering; First cycle; G1F	DV1674	7.5	X			
Softwarized Networks Computer Science; Electrical Engineering; Second cycle; A1F	DV2603	7.5		X		
Machine learning Computer Science; Second cycle; A1F	DV2626	7.5		X		
Multiprocessor Programming Computer Science; Second cycle; A1N	DV2597	7.5		X		
Software Security Computer Science, Software Engineering; Second cycle; A1N	DV2620	7.5		X		