

Programme Syllabus

Master's Programme in Software Engineering (120 credits)

**Masterprogram i Software Engineering
(120 högskolepoäng)**

Established by: Pro-Vice-Chancellor and the Deans

Date of establishment: 18 May 2020

Reg no: BTH-4.1.10-0507-2020

Programme code: PAASW

Adopted by: Pro-Vice-Chancellor and the Deans

Date of adoption: 3 November 2025

Date of revision: 17 June 2026

Reg no: BTH-4.1.13-0673-2026

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

Software engineering combines computer science and engineering together with aspects of social and behavioral sciences (economics, management, sociology, and psychology). Software engineering deals with techniques, methods, and processes for the development, evolution, and maintenance of complex software systems. The subject includes the application of a systematic, disciplined, quantifiable, and sustainable approach to the development, operation, and maintenance of software systems.

The program's goals are secured through compulsory courses in areas such as:

- Methods, models, tools, and languages in software development.
- Planning, development, operation, and maintenance of software systems.
- Quality management of models, products, and processes for software systems.
- Project management and teamwork

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 program is two years long and consists of compulsory and elective courses. The compulsory courses provide a broad foundation and cover several advanced topics required by the software engineering industry.

The elective courses give students the opportunity to influence the content of their degree and contribute to increasing their attractiveness to future employers. The courses provide insight into proven methods, the latest developments, and the latest research findings.

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

Most courses consist of a number of lectures and seminars, as well as one or more assignments that the student is expected to work on individually or in groups. The second year begins with a project course in which the student is expected to perform maintenance work on existing software. This is followed by a course focused on research projects with an opportunity to conduct a scientific preliminary study before the master's thesis in the final semester.

Software engineering is inherently an international subject and profession, based on research and practice from around the world. The tools, techniques, and processes used and taught are thus widely accepted for the global industry by software developers.

The programme is designed in accordance with this international practice and prepares students to operate in a worldwide job market and an equally worldwide research frontier.

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

Degree

After completing the studies, the student can apply for a 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: Software Engineering

Part 2 — Course in the programme

Masterprogram in Software Engineering (120 credits)

Admitted: autumn 2026

The name of the course	Course code	Credits	Autumn Sp1	Autumn Sp2	Spring Sp3	Spring Sp4
Education year 1						
Agile and Lean Software Development Software Engineering; Second cycle; A1N	PA2555	7.5	X			
Seminar Series in Software Engineering Software Engineering; Second cycle; A1N	PA2550	7.5	X			
Software Architectures and Quality Software Engineering; First cycle; GIF	PA1453	7.5		X		
Requirements Engineering and Product Management Software Engineering; Second cycle; A1N	PA2591	7.5		X		
Software Testing Software Engineering; Second cycle; A1N	PA2552	7.5			X	
Research Methodology in Software Engineering and Computer Science Computer Science, Software Engineering; Second cycle; A1N	PA2554	7.5			X	
Software Metrics Software Engineering; Second cycle; A1N	PA2559	7.5				X
One or more elective courses. See choices below.			-	-	-	-
Elective courses education year 1						
Decision Support System Computer Science; Second cycle; A1N	DV2573	7.5				X
Mathematical Statistics The course does not belong to any main field of study at BTH; First cycle; GIF	MS1411	7.5				X
Behavioural Software Engineering Software Engineering, Second cycle; A1N	PA2570	7.5				X

Social Sustainability in Product- and Service Development Strategic Leadership towards Sustainability; Second cycle; A1N	SL2571	7.5				X
Education year 2						
Software Evolution and Maintenance Project Software Engineering; Second cycle; A1N	PA2558	7.5	X			
Advanced Topic in Software Engineering Software Engineering; Second cycle; A1F	PA2560	7.5		X		
Software Quality Management Software Engineering; Second cycle; A1N	PA2557	7.5		X		
Master's Thesis (120 credits) in Software Engineering Software Engineering; Second cycle; A2E	PA2534	30			X	X
One or more elective courses. See choices below.			-	-	-	-
Elective courses education year 2						
Applied Cloud Computing and Big Data Software Engineering; Second cycle; A1N	PA2577	7.5	X			
Applied Artificial Intelligence Computer Science; Second cycle; A1N	DV2618	7.5	X			
Performance Optimization Computer Science, Software Engineering; First cycle; G1F	DV1674	7.5	X			