Programme Syllabus

Master's Programme in Software Engineering (60 credits)

Magisterprogram i Software Engineering (60 högskolepoäng)

Established by: the Board of Education

Date of establishment: 15 June 2020

Reg no: BTH-4.1.10-0619-2020

Programme code: PAASA

Adopted by: Pro-Vice-Chancellor and the Deans

Date of adoption: 3 November 2025

Date of revision: 17 June 2026

Reg no: BTH-4.1.13-0675-2026

Applies to students admitted: spring 2027

Part 1 — Description of the degree programme

Entry requirements

Admission to the degree programme requires:
Bachelor of Science in Engineering or Bachelor of Science in a technical field, including a degree project of at least 15 credits. At least two years of professional experience of software development after graduation (shown by employer certificate). The work experience is expected to include programming skills (shown by employer certificates). English 6.

Outcomes and content

The degree program covers important areas of knowledge in software engineering, such as requirements engineering, software testing, and the software life cycle. The degree program also offers specialized knowledge in areas such as software security, machine learning technology, and cloud computing. Finally, the degree programme also includes a course in research methodology, which forms the basis for the implementation of the degree project, which is a central part of the degree programme.

In order to solve complex problems in software development, students are trained in knowledge areas in software development such as requirements engineering, adaptive software testing and agile product development. Issues that they learn to deal with include optimizing software processes, ensuring secure systems, and managing large-scale data. Skills in cloud computing and machine learning technology enable them to design scalable systems and maintain efficient machine learning operations. These abilities enable students to tackle real-world challenges in software development. Through this, they develop autonomy in project planning, scientific and critical thinking, and effective communication.

National outcomes

Knowledge and understanding

For a Degree of Master (60 credits) the student shall

- demonstrate knowledge and understanding in the main field of study, including both an overview of the field and 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 (60 credits) the student shall

- demonstrate the ability to 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 autonomously as well as to plan and, using appropriate methods, undertake advanced tasks within predetermined time frames
- demonstrate the ability in speech and writing to report clearly 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 employment in some other qualified capacity.

Judgement and approach

For a Degree of Master (60 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 degree programme begins with courses that provide students with a broad understanding of software development, such as requirements management, testing, and agile methodologies. Subsequent courses develop more specialized skills in areas such as cloud computing, security, and machine learning technology. In the second year, students complete a degree project, where they

can immerse themselves in an area of software development. This helps them to apply their knowledge and conduct in-depth research in their area of interest.

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 degree programme is 60 credits and is given at a distance with a 50 % study pace over a period of two years. During the first year, students take four courses. The second year consists of two courses in the selected areas of the degree programme and a degree project combined with research methodology for professionals.

The teaching is conducted via the university's web-based learning platform and includes, among other things, written instructions, recorded lectures, web meetings, assignments and smaller projects in groups.

The courses in the degree program primarily make use of problem-based learning by integrating real-world challenges into the curriculum. This gives students the opportunity to apply theoretical knowledge in practical situations. With the help of their work experience and experience from industrial contexts, students are able to solve complex problems in the various parts of the degree programme's courses.

Courses across semester boundaries

Research Methodology and Master's Thesis in Software Engineering for Professionals, 18 credits: 3 credits are studied semester 3 and 15 credits are studied semester 4.

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 too few applicants apply, 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, the degree objectives in the Higher Education Ordinance must have been achieved and the requirements stated in the *Local Degree Ordinance at BTH* must have been met.

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

Degree of Master of Science (60 credits)
Main field of study: Software Engineering

Part 2 — Course in the programme

Master's Programme in Software Engineering (60 credits)

Admitted: spring 2027

The name of the course	Course code	Credits	Spring Sp3	Spring Sp4	Autumn Sp1	Autumn Sp2
Education year 1						
Adaptive Lean Software Testing Software Engineering, Second cycle, A1N	PA2579	7.5	X	X		
Product and Requirements Management for digital environments Software Engineering, Second cycle, A1N	PA2578	7.5	X	X		
Agile and Lean development of software-intensive products Software Engineering, Second cycle, A1N	PA2580	7.5			X	X
Applied Cloud Computing and Big Data Software Engineering, Second cycle, A1N	PA2577	7.5			X	X
Education year 2						
Research Methodology and Master's Thesis in Software Engineering for Professionals Software Engineering, Second cycle, A1E	PA2592	18	X	X	X	X
Machine Learning Engineering Software Engineering, Computer Science, Second cycle, A1N	PA2595	6	X	X		
Introduction to Security in the Software Development Lifecycle Software Engineering, Second cycle, A1N	PA2585	6	X	X		