



# Programme syllabus

Master's Programme, Water System Technology, 120 credits

Masterprogram, vattensystemteknik

*120.0 credits*

---

*Valid for students admitted to the education from autumn 09 (HT - Autumn term; VT - Spring term).*

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

## Programme objectives

The programme is unique in providing students with a cutting edge in water technology combined with solid understanding of natural system dynamics. The key focus of the program is technology in a (classical) narrow sense and technology in a broad (meta-technology) sense, where water is approached on local, regional to global scales, from natural to anthropogenic system perspectives. A wide spectrum of water-related problems in the society will be addressed in the courses of the program, from classical water supply and sanitation, to hydraulic structures and flooding, to groundwater and coastal zone protection. In spite of the wide spectrum of problems, emphasis will be given on common aspects of engineering solutions. A socio-economic perspective on water use and protection from a stakeholder perspective and water conflict resolution will also be given within several courses.

In the programme we use modern pedagogical methods combining e-learning with classical teaching. As a student, you will have the opportunity to use simple as well as advanced models according to interest and skills, you will be challenged by field and as well as laboratory work and be exposed to case studies from technology implementation to evaluation of catchment-based water management strategies. Model use will always be accompanied with stimulation of critical thinking, with emphasis on understanding limitations of models and input uncertainties. Assignments with comprehensive multi-task problems that stretch through several courses will provide opportunities to address complexities of real world problems. Last but not least, projects-assignments will be whenever possible linked to ongoing national and international projects of leading Stockholm-based companies.

The aim of the programme which is outlined below is to explore all major aspects of use and protection of available water resources. The programme deals with all the complexities, challenges and opportunities in water resources management through water systems approaches and will allow participants to focus particular attention on preferred problem areas.

The programme targets participants who have already attained an acceptable level of general competence. Candidates are thus expected to have the personal qualities and the educational background that will allow them

## **Knowledge and understanding**

After completing the programme requirements students shall:

- have developed their skills in applied mathematics and broaden their understanding of the theory and technology relating to Water Systems Technology
- have a deeper understanding of available tools and methods, that are commonly used in the field of Water Systems Technology
- have a broad scientific and system based knowledge and understanding that can be applied to analyse and manage water systems at micro as well as macro scales

## **Skills and abilities**

After completing the programme requirements students shall:

- have developed their research skills and their professionalism in presenting oral and written reports
- be able to work constructively and efficiently in matters that depend on team work and good personal relations
- be able to routinely monitor practical and theoretical developments in the field of Water Systems Technology
- be able to apply concepts, tools and theoretical approaches in the different processes involved in water management
- be able to carry out advanced studies on current problems, opportunities and future needs in the field of water management at the local, national and international level

## **Ability to make judgements and adopt a standpoint**

After completing the programme requirements students shall be able to:

- develop their competence to identify and define water related problems and present alternative approaches in solving them
- approach professional challenges objectively and creatively and play a leading role in the search for solutions to complex water related problems

## **Extent and content of the programme**

The duration of the programme is two years, which correspond to 120 credits, higher education level. It consists of three semesters of course work (90 credits) and one semester (30 credits) of Degree project. The education is at the advanced level. The literature and all other course material are in English, which also is the teaching language.

## **Eligibility and selection**

### ***General admission requirements***

The general admission requirements are the same for all programmes General admission requirements (<http://www.kth.se/studies/master/application?l=en>)

## ***Specific admission requirements***

The specific requirements may be assessed as not fulfilled if

1. the average grade is in the lower third on the grading scale used (above pass level)
2. the degree awarding institution is not considered to meet acceptable quality standards by the authorities of the country in which the institution is located
3. the degree does not qualify for admission to equivalent Master level in the country where the degree is awarded

The specific admission requirement for the programme is a Bachelor degree in the field of engineering i.e. civil or environmental engineering or a degree in environmental/geosciences relevant to the scope of the programme. Students shall have basic skills in chemistry, physics and computer science and also a good knowledge of English, equivalent to Eng B. Students shall have documented proof of (through university-level studies) good knowledge in mathematics.

The selection process for Water System Technology is based on a total evaluation of the following selection criteria: university, GPA, course work related to the programme, thesis proposal, motivation letter, working experiences and references.

## **Implementation of the education**

### **Structure of the education**

The purpose of the Master's Programme is to fill the growing demand for a professional profile that will shape, manage and improve water resources management through applying advanced methods, techniques and modeling to identify, describe, and solve water resources problems.

The academic year covers 40 weeks, starting in September divided into two terms, which each consists of two study periods. Each study period concludes with a regular examination period of at least one week.

### **Courses**

The programme is course-based. Lists of courses are included in [appendix 1](#).

### **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.

### **Conditions for participation in the programme**

To be enrolled in the programme, you must be duly accepted into the programme with a valid admission letter issued by KTH Central Admissions Office. You must also pay your Student Union dues at the start of each semester in order to enrol in the programme.

In addition to signing in as course participant at the beginning of a course and attending lectures, participation in class exercises and projects is a compulsory part of enrolling in any course.

### **Conditions for being promoted to the next level**

*For studies in study year 2:* At least 45 higher education credits from study year 1 must be completed by the exam period in August. Students which have not fulfilled this requirement must set up an individual study plan. The main goal with the study plan is that the student should complete the remaining courses during the next study year. In the study plan, the remaining elements and also suitable courses from the next study year are included. Special regard should be taken to the courses prerequisites.

### **Recognition of previous academic studies**

The Royal Institute of Technology has a policy for recognising previous academic studies. The decision on recognising documented results from similar education at other universities is taken by the vice dean of education at the School of Architecture and the Build Environment upon application by the student.

### **Studies abroad**

It is presently not possible for Master's students at the School of Architecture and the Build Environment.

### **Degree project**

The programme is concluded with a Degree project which gives the student the opportunity to investigate a problem in depth, under the supervision of experienced practitioners and researchers.

The Degree Project (30 credits) is compulsory in order to apply for a Master Degree at KTH. The prerequisite for starting the degree project is completed courses corresponding to 60 credits. The Degree project is graded on a scale A-F, where A-E are passing grades with A as the highest grade.

The topic is identified in consultation with the programme management and the students are also recommended to try to find relevant thesis projects linked to important topics in their home countries. The degree project may be carried out either in an academic environment or in a practical/industrial setting and may be carried out individually or in a group of two.

### **Degree**

Students who have fulfilled all course requirements in the Master's programme (120 ECTS) will be awarded a "Teknologie masterexamen", translated into English as "Degree of Master of Science (two years)". An application for the degree certificate should be submitted to the Master administrator, together with a copy of a student union card, copy of receipts or a certificate from the student union office, and an attested photocopy of the previous university degree (B.Sc. or a B. Eng, or equivalent). The degree certificate will be mailed to the student's permanent address by registered mail.

Please note that this degree do not correspond to the Swedish degree "Civilingenjör".

[Appendix 1 - Course list](#)

[Appendix 2 - Programme syllabus descriptions](#)



# Appendix 1: Course list

Master's Programme, Water System Technology, 120 credits  
(TWSTM), Programme syllabus for studies starting in autumn 2009

---

## General courses

### Year 1

#### Mandatory courses (45.0 Credits)

Course code	Course name	Credits	Edu. level
<a href="#">AE2103</a>	<a href="#">Environmental Aquatic Chemistry</a>	7.5 hp	Second cycle
<a href="#">AE2202</a>	<a href="#">Dynamics of Environmental Systems</a>	7.5 hp	Second cycle
<a href="#">AE2504</a>	<a href="#">Water Governance</a>	7.5 hp	Second cycle
<a href="#">AE2505</a>	<a href="#">Water Systems and Geographic Information</a>	7.5 hp	Second cycle
<a href="#">AE2608</a>	<a href="#">Engineering Hydrology and Climate</a>	7.5 hp	Second cycle
<a href="#">AE2706</a>	<a href="#">Integrated Water Resources Management</a>	7.5 hp	Second cycle

#### Conditionally elective courses

Course code	Course name	Credits	Edu. level
<a href="#">AE2104</a>	<a href="#">Environmental Measuring and Monitoring</a>	7.5 hp	Second cycle
<a href="#">AE2301</a>	<a href="#">Water and Waste Handling</a>	7.5 hp	Second cycle
<a href="#">AE2602</a>	<a href="#">Applied Hydrology</a>	7.5 hp	Second cycle
<a href="#">AE2609</a>	<a href="#">Hydraulic Engineering Systems</a>	7.5 hp	Second cycle

### Year 2

#### Mandatory courses (22.5 Credits)

Course code	Course name	Credits	Edu. level
<a href="#">AE2106</a>	<a href="#">Project in Water System Technology</a>	15.0 hp	Second cycle
<a href="#">AE2406</a>	<a href="#">Research Methodology</a>	3.0 hp	Second cycle

[AK2030](#) [Theory and Methodology of Science \(Natural and Technological Science\)](#)

4.5 hp Second cycle

### Conditionally elective courses

<b>Course code</b>	<b>Course name</b>	<b>Credits</b>	<b>Edu. level</b>
<a href="#">AE2102</a>	<a href="#">Quantitative Hydrogeology</a>	7.5 hp	Second cycle
<a href="#">AE211X</a>	<a href="#">Degree Project in Ground Water Chemistry, Second Cycle</a>	30.0 hp	Second cycle
<a href="#">AE2302</a>	<a href="#">Water Treatment Processes and Technology</a>	7.5 hp	Second cycle



## Appendix 2: Specialisations

Master's Programme, Water System Technology, 120 credits  
(TWSTM), Programme syllabus for studies starting in autumn 2009

---

This programme has no specialisations.