Programme syllabus

Master's Programme, Infrastructure Engineering, 120 credits
Masterprogram, teknisk infrastruktur
120.0 credits

Valid for students admitted to the education from autumn 11 (HT - Autumn term; VT - Spring term).

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

Programme objectives

The information is valid for students who started the program academic year 2010/2011. Later decisions may affect year 2 in the program. Please look at www.kth.se/studies?l=en_UK for further information.

There is a great need for well educated specialists within the area of Infrastructure Engineering. This, in fact unique, Master of Science programme in Infrastructure Engineering offered by the Department of Civil and Architectural Engineering provides students with the necessary competence to analyse and solve complex problems within infrastructure technology.

Knowledge and understanding

Students will learn how to design, build and maintain roads, streets, railway track, bridges and tunnels using advanced methods and techniques. They will also develop a certain capability of integrating technology with other aspects such as environment, sustainable development, aesthetics, and social and economic responsibility.

Skills and abilities

The programme is intended for students who wish to pursue careers within the Construction and Consulting industry, public authorities, such as the Road or Rail Administrations, or in other industries. The students will also be able to pursue an academic research career.

Ability to make judgements and adopt a standpoint

Through class discussions, project work and examinations we aim to train our graduates to be able to reason, reflect on their own studies and make sound judgment on issues relating to infrastructure engineering. In particular we aim to train graduates to be able to make good use of incomplete information to arrive at reasonable conclusions on a variety of issues.

Extent and content of the programme

The duration of the programme is two years; 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. All courses are in principal mandatory. There are at present no specialisations.

The programme focuses on techniques for designing, building and maintaining of roads, streets, railway track, bridges and tunnels. Special attention will be paid to social, environmental and sustainable aspects.
All the courses are, in principle, compulsory. However, students are able to replace compulsory courses by other KTH courses within the field of Infrastructure Engineering which correspond to a maximum of 15 ECTS. Such courses must be approved by programme management and the vice dean of education at the school of ABE. The fourth and last term is devoted to a Final Degree Project within Highway Engineering, Soil and Rock Mechanics or Bridge and Railway Track Engineering.

**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](http://www.kth.se/studies/master/application?l=en))

*Specific admission requirements*

The specific admission requirement for this Master’s programme is a Bachelor’s Degree in the field of civil engineering or architecture relevant to the scope of the programme.

Previous studies must have included fundamental courses in Structural mechanics and Design, involving materials such as concrete, steel, rock and soil.

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

*Selection process:* The selection process for Infrastructure Engineering – Roads/Railway track/Bridges/Tunnels is based on a total evaluation of the following selection criteria: university, GPA and course work related to the programme. The students are required to be proficient in English, equivalent to English studies at upper secondary level (post-16) in Sweden, called English B. Equivalent knowledge in English can be verified through an internationally recognised test as for example:

- IELTS (an overall mark of 6.5 and no section below 5.5)
- TOEFL.

**Implementation of the education**

*Structure of the education*

The Academic year in Sweden consists of an autumn and a spring term. The structure of the academic year, semesters and other study periods are described at the attached link.

The educational structure at KTH. The academic year covers 40 weeks, starting in September divided into two terms, which each consists of two study periods (KTH-Handbook 2, Flap 4.2). 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.

All courses, including compulsory courses, must be selected via [www.studera.nu](http://www.studera.nu). Read more about how to do this by carefully studying the information on the following link: [http://www.kth.se/student/program-kurser?programme=me](http://www.kth.se/student/program-kurser?programme=me)

*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.
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**Conditions for participation in the programme**

To be able to participate in the studies the student must enroll for the next term every spring and fall. This is done via “Mina Sidor” on KTH’s website between November 1st and 15th and between May 1st and 15th. With the enrollment, the student has submitted their intention of studying and participating in the programme.

In addition to signing an attendance list at the beginning of a course, participation in class exercises and projects are a compulsory part of enrolling in any course.

The prerequisite for starting the Master’s Project is completed courses corresponding to 60 credits.

**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**

There are at present not possible for Master’s students at the school of Architecture and the Build Environment to exchange semester one, two or three for studies abroad.

**Degree project**

The Degree Project (30 credits) is compulsory in order to apply for a Master Degree at KTH. The Master’s project for students at Infrastructure Engineering is within Highway Engineering, Soil and Rock Mechanics or Bridge and Railway Track Engineering, or other subject closely related to Infrastructure Engineering. The prerequisite for starting the degree project is completed courses corresponding to 60 credits.

**Degree**

Students who have successfully completed the programme will be awarded a "Teknologie masterexamen", translated into English as "Degree of Master of Science (two years)". The student must apply for the degree certificate. Before application all courses should be completed and reported. Documents to hand in to Masters administrator are: 1) The application form; 2) A copy of student union card, copy of receipts or a certificate from the student union office; 3) Attested photocopy of the previous university degree.

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, Infrastructure Engineering, 120 credits (TISEM), Programme syllabus for studies starting in autumn 2011

### General courses

#### Year 1

**Mandatory courses (60.0 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF2003</td>
<td>Structural Engineering, Advanced Course</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2004</td>
<td>Concrete and Steel Structures</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2024</td>
<td>Finite Element Methods in Analysis and Design</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2201</td>
<td>Bridge Design</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2602</td>
<td>Rock Mechanics</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2609</td>
<td>Foundation Engineering</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2901</td>
<td>Road- and Railway Track Engineering</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2903</td>
<td>Road Construction and Maintenance</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

#### Year 2

**Mandatory courses (7.5 credits)**

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF2023</td>
<td>Theory and Methodology of Science and Risk and Safety in Building Sciences</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

### Conditionally elective courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AF2024</td>
<td>Finite Element Methods in Analysis and Design</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF212X</td>
<td>Degree Project in Concrete Structures, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2203</td>
<td>Advanced Bridge Design</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>Course code</td>
<td>Course name</td>
<td>Credits</td>
<td>Edu. level</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------</td>
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<td>------------------</td>
</tr>
<tr>
<td>AF222X</td>
<td>Degree Project in Structural Design and Bridges, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF232X</td>
<td>Degree Project in Building Materials, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF242X</td>
<td>Degree Project in Building Technology, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF252X</td>
<td>Degree Project in Building Services Engineering, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2610</td>
<td>Tunnel Engineering</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF2611</td>
<td>Geotechnical Engineering, Advanced Course</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF262X</td>
<td>Degree Project in Soil and Rock Mechanics, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AF282X</td>
<td>Degree Project in Steel Structures, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2905</td>
<td>Advanced Pavement Engineering Analysis and Design</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Appendix 2: Specialisations

Master's Programme, Infrastructure Engineering, 120 credits (TISEM), Programme syllabus for studies starting in autumn 2011

This programme has no specialisations.