Programme syllabus

Master's Programme, Transport and Geoinformation Technology, 120 credits
Masterprogram, transport och geoinformatik
120.0 credits

Valid for students admitted to the education from autumn 13 (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 2013/2014. Later decisions may affect year 2 in the program. Please look at www.kth.se/studies?l=en_UK for further information.

Knowledge and understanding

After completing the programme the students will:

- Have knowledge about collecting, structuring, storing, analysing and visualisation of geospatial and transport data.
- Have knowledge about analysis, planning, assessment, and operations of transport systems and other urban and regional phenomena at different spatial levels.

Skills and abilities

After completing the programme, the students will acquire practical skills to:

- Process the measured data using appropriate mathematical tools
- Structure and visualize geospatial data using information technology
- Model transport or geospatial phenomena using appropriate decision support tools
- Solve complex problems and present decision support for policy-makers and the general public.

The programme also aims to help students develop capability to conduct independent, scientific research through critical analysis and synthesis. Students will receive training in scientific communication and presentation, both oral and in written form. Students will also learn how to work in project form and work in groups.

Ability to make judgements and adopt a standpoint

After completing the programme, the students will be able to:

- Choose proper method for data collection and analysis according to the requirements of given problem
- Assess the possibilities and limitations of decision support tools and their applications in different scientific and technological branches
- Identify the needs for new or the further development of existing methods, technologies and algorithms used in the process of collection, storing, analysing and visualisation of geospatial and transport data
- Apply a systems view of thinking and critically analyse the subject area’s tools of analysis and modelling.

Extent and content of the programme

The duration of the programme is two years which correspond to 120 credits of higher education: three semesters of course work (90 credits) and one semester (30 credits) of a Degree Project.
The education is at the advanced level (second cycle). The literature and all other course material are in English, which also is the teaching language. There are presently no specialisations.

**Eligibility and selection**

The general admission requirements are the same for all programmes. Please see the general admission requirements (http://www.kth.se/en/studies/programmes/master?l=en_UK).

Specific admission requirements for the programme are that the student has:

- Bachelor degree (180 credits) with a specialisation in civil engineering, urban planning, environmental science, geodesy, geographic information systems, computer science, or another field with a clear relevance to the program.
- At least 60 credits in transport engineering and planning, geomatics, physics, computer science, statistics, and/or mathematics, of which at least 6.0 credits per course should be in each of:
  - Computer programming.
  - Linear algebra.
  - One of geographic information systems, database technology, or geodetic surveying.
  - Mathematical statistics, and
  - Single-variable calculus.

Applicants are priority-rated using a ranking based on the following criteria: quality of undergraduate university (3.5), grades (4), subject area of degree (2.5), motivation letter and/or degree project idea (3), relevant work experience (1), reference letters (1.5), and proficiency in English (2).

**Implementation of the education**

**Structure of the education**

The academic year is 40 weeks and is divided into two semesters, autumn and spring. Each semester consists of two study periods.

For information on the extent of the school year, the exam period and the re-exam period see http://www.kth.se/student/schema.

**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**

*Course enrollment/term registration*

A prerequisite for studying at KTH is that every term, students must enroll in their courses and register for the term.

*Course registration*

Registration for courses requires course selection in LADOK (student registry). Course selection is done either through the course selection web application or through the student’s educational office. Course registration is done by the department giving the course. Students wishing to drop the course should notify the department that is giving the course.
Recognition of previous academic studies

Students may request to be given credit for a course/courses from another college/university within or outside Sweden. KTH’s policy for recognising previous academic studies is available in full in KTH’s regulations at www.kth.se.

Studies abroad

This programme offers opportunities to study abroad. In order to be eligible for studies abroad within the framework of any exchange agreement with foreign universities, students should be enrolled at KTH, have completed at least two years of studies, and be keeping pace with their studies.

Selection is based on weighted average grades in compulsory courses.

For more information, refer to KTH’s regulations at http://intra.kth.se/regelverk/utbildning-forskning/grundutbildning/utbytesstudier.

Degree project

The Degree Project (30 credits) is compulsory in order to complete a Master Degree at KTH. Students can choose between the Master’s Projects listed in Appendix 1. The prerequisite for starting the Degree Project is that they have completed the programme’s courses corresponding to 60 credits. Additional details for how the degree project should be carried out can be found in the KTH regulations.

Degree

To obtain master's degree students must have passed courses of at least 120 higher education credits, of which the following must be included:

- at least 90 higher education credits from courses on the second level that are included in the master programme (including the master thesis of 30 higher education credits), and at least 15 additional credits from courses in any engineering area
- a maximum of 15 higher education credits of entirely elective courses;
- an approved course in Theory and Methodology of Science

In the event that the master's program is a final part of the degree programme in Civil Engineering and Urban Management or of the degree programme in Energy and Environment, there may be additional requirements according to the corresponding study programmes. For example, a master of science degree in the above degree programmes should include mathematics and science subjects for a minimum of 45 higher education credits.

Application for Degree

An application for the degree is submitted to the educational administration (advising office).

Information about advising and other documents that should be submitted in conjunction with the application can be found at the link: http://www.kth.se/student/examen

Appendix 1 - Course list
Appendix 2 - Programme syllabus descriptions
Appendix 1: Course list

Master's Programme, Transport and Geoinformation Technology, 120 credits (TTGTM), Programme syllabus for studies starting in autumn 2013

General courses

Year 1

Optional courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG2411</td>
<td>GIS Architecture and Algorithms</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2416</td>
<td>Advanced Remote Sensing</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2425</td>
<td>Spatial Databases</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2925</td>
<td>Geodata Quality</td>
<td>3.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2171</td>
<td>Traffic Engineering and Management</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2173</td>
<td>Public Transport</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2301</td>
<td>Transport Policy and Evaluation</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2303</td>
<td>Transport and Sustainable Development</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2311</td>
<td>Transport and Travel Surveys</td>
<td>3.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2923</td>
<td>Global Navigation Satellite Systems (GNSS)</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Recommended courses

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG2414</td>
<td>Spatial Analysis</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2429</td>
<td>Geovisualization</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2177</td>
<td>Transport and Geodata Analysis</td>
<td>6.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2307</td>
<td>Urban Modeling and Decision Support</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>
Year 2

Mandatory courses (15.0 credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK2036</td>
<td>Theory and Methodology of Science with Applications (Natural and Technological Science)</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AK2038</td>
<td>Theory and Methodology of Science with Applications (Social Science)</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>AG2417</td>
<td>Web and Mobile GIS</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2421</td>
<td>A GIS Project</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG242X</td>
<td>Degree Project in Geoinformatics, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH201X</td>
<td>Degree Project in Traffic and Transport Planning, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2026</td>
<td>Railway Traffic - Market and Planning, Basic Course</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH202X</td>
<td>Degree Project in Railway Operation, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2102</td>
<td>Logistics and Transportation</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH213X</td>
<td>Degree Project in Logistics, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2174</td>
<td>Traffic Simulation Modelling and Applications</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH220X</td>
<td>Degree Project in Transport- and Location Analysis, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH221X</td>
<td>Degree Project in Systems Analysis and Economics, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2314</td>
<td>Individual Choice Modeling and Market Analysis</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2915</td>
<td>Laser Scanning Technology</td>
<td>7.5</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH292X</td>
<td>Degree Project in Geodesy, Second Cycle</td>
<td>30.0</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

Supplementary information

Students need to chose only ONE of the Theory and Methodolgy courses plus ONE degree project within year 2.
Appendix 2: Specialisations

Master's Programme, Transport and Geoinformation Technology, 120 credits (TTGTM), Programme syllabus for studies starting in autumn 2013

This programme has no specialisations.