Programme syllabus

Master's Programme, Geodesy and Geoinformatics, 120 credits
Masterprogram, geodesi och geoinformatik
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

Knowledge and understanding

After completing the programme, students should have deep knowledge in geographic information technology.

Skills and abilities

After completing the programme, students should acquire practical skills to

- define and use geodetic coordinate systems
- carry out surveying tasks by terrestrial and satellite-based methods
- structure and visualize geospatial data using information technology
- build Geographic Information Systems (GIS)

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

Extent and content of the programme

The programme, taught entirely in English, will run for two years and include 90 credits of course work and 30 credits for the final degree project. The education level of the programme is at the second cycle.

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

Specific eligibility requirements for this master programme are documented proof of (through university-level studies):

- basic knowledge in surveying and mapping
- good knowledge and practical skills in computer science, especially in computer programming
- good knowledge in mathematics including mathematical analysis, linear algebra and mathematical statistics.

Selection criteria for the master programme are: previous BSc/MSc degree, university, grade of previous course work and relevant working experiences. Documented excellency in mathematics or computer programming is a recognized merit. The students are required a good knowledge of English, equivalent to Eng B.

**Implementation of the education**

**Structure of the education**

The programme consists of two academic years. Each academical year is divided into two semesters and four periods. The programme includes 90 credits of course work and 30 credits for the final degree project.

**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, a student must be duly accepted into the programme with a valid admission letter issued by KTH Central Admissions Office. Student must also pay the Student Union fees at the start of each semester in order to enroll in the programme. Students should select courses before the start of each semester. Course selection should observe the prerequisite condition stipulated for each course.

At the beginning of a course, a student should sign on a participation list in order to be registered for the course. A student should have completed at least 75% of courses, i.e. at least 22.5 credits each semester, before being allowed to continue studies in the following semester. Students should have completed 67.5 credits of courses before starting the final degree project.

**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 students of this master programme to study abroad in the first three semesters. However, students are allowed to carry out the master’s degree project abroad after approval by the programme coordinator.

**Degree project**

Degree project is administratively registered as a course of 30 credits. It is intended to give students an opportunity to apply knowledge and skills to solve scientific problems in geodesy, photogrammetry, geoinformatics and remote sensing. One of the main objectives is to help students develop capability to conduct independent, scientific research characterized by critical analysis and synthesis.

Through the degree project, a student will learn how to analyze, formulate and define scientific problems, find and evaluate possible solutions and finally present the results in a thesis which shall be presented and defended in a public seminar. In addition, students will get practical training in scientific communication and presentation, both orally and in written form. Literature review alone or just writing a computer programme is not sufficient for a degree project. Students should have completed 67.5 credits of courses before starting the final degree project.

A proposal to degree project can be worked out by the student or together with supervisors at or outside KTH. Before carrying out the degree project work, a project plan must be submitted and approved by the examiner. Degree project will be graded based on the ECTS scale: A-F.

**Degree**

Students who have completed programme courses of at least 90 credits as well as the final degree project of 30 credits will be awarded a "Teknologe masterexamen", translated into English as "Degree of Master of Science (two years)".
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, Geodesy and Geoinformatics, 120 credits (TGEGM), Programme syllabus for studies starting in autumn 2009

### General courses

#### Year 1

### Mandatory courses (45.0 Credits)

<table>
<thead>
<tr>
<th>Course code</th>
<th>Course name</th>
<th>Credits</th>
<th>Edu. level</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG2411</td>
<td>GIS Architecture and Algorithms</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2412</td>
<td>Geovisualisation</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2414</td>
<td>Spatial Analysis</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2921</td>
<td>Adjustment Theory</td>
<td>6.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2922</td>
<td>Map Projections and Reference Systems</td>
<td>9.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2923</td>
<td>Global Navigation Satellite Systems (GNSS)</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
</tbody>
</table>

### 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>AG2413</td>
<td>Digital Image Processing and Applications</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2415</td>
<td>Web-GIS</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2914</td>
<td>Physical Geodesy</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2915</td>
<td>Laser Scanning Technology</td>
<td>7.5 hp</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>AK2036</td>
<td>Theory and Methodology of Science with Applications (Natural and Technological Science)</td>
<td>7.5 hp</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>AG2421</td>
<td>A GIS Project</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2425</td>
<td>Spatial Databases</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG2426</td>
<td>Mobile GIS</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AG242X</td>
<td>Degree Project in Geoinformatics, Second Cycle</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2916</td>
<td>Integrated Navigation</td>
<td>30.0 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2917</td>
<td>Advanced Theory of Errors</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH2924</td>
<td>Engineering Surveying</td>
<td>7.5 hp</td>
<td>Second cycle</td>
</tr>
<tr>
<td>AH292X</td>
<td>Degree Project in Geodesy, Second Cycle</td>
<td>30.0 hp</td>
<td>Second cycle</td>
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Appendix 2: Specialisations

Master's Programme, Geodesy and Geoinformatics, 120 credits (TGEGM), Programme syllabus for studies starting in autumn 2009

This programme has no specialisations.