



UNIVERSITY OF GÄVLE

STUDY PLAN

ADVANCED LEVEL

MASTER'S PROGRAMME IN GEOMATICS

Programme code: TAGEM

Approved by the NT-board 2006-11-30

**Study Plan
Master's Programme in Geomatics
60 ECTS credits**

This study plan applies to students registered autumn term 2007 or later

MASTER'S PROGRAMME IN GEOMATICS

University of Gävle (HiG)

1 General organisation

The master's degree at Swedish Universities is given as an advanced programme after a bachelor's degree or a professional degree of 180 ECTS credits. The master's degree where all the courses are at advanced level is a preparation for doctoral studies, but it can also be given with a certain breadth with professional special competence in mind. According to the Higher Education Ordinance a master's degree is achieved after completed course requirements of exactly 60 ECTS credits. The education is directed towards those with a previous academic education within geomatic related subject fields who wish to further educate themselves in geomatics.

The master's advanced programme is given as studies at either full time or part time over a period of one respectively two years. At full time studies the part time courses are read two at a time except for the degree thesis work which is read full time. The programme is run preferably as a closely connected theme which embraces all aspects of the subject and discipline and is adapted for the needs of the labour market of a specially educated work force.

The programme is designed to build upon with the student's education at basic level in the Geomatics programme of 180 ECTS credits at HiG (University of Gävle) and any work experience, but it is also open for students with an equivalent Swedish or foreign background. Great demand is placed on the degree thesis being at advanced level, that is with an academic attitude to form and content. Furthermore it should clearly focus towards future professional work. The education may be wholly or partly given in English.

2 Objectives

2.1 Objectives for higher education at advanced level according to the Higher Education Act, chap 1, § 9 and the examination description according to the Higher Education Ordinance appendix 2

2.1.1 Objectives for higher education at advanced level according to the Higher Education Act, chap 1, § 9

Education at advanced level will essentially build on the proficiency which students gained within the education at basic level or equivalent attainment.

Education at advanced level shall involve a deepening of knowledge, skills and abilities in relation to the education at basic level and shall, in addition to that which applies for the education at basic level,

- further develop the students ability to independently integrate and use knowledge,
- develop the students ability to manage complex facts, problems and situations, and
- develop the students qualifications for a working life which places great demand on independence or for research and development work.

2.1.2 Degree description according to the Higher Education Ordinance, appendix 2

Master's Degree

Extent

The master's degree is obtained after the student has completed the course requirements of 60 ECTS credits with particular focus decided on by the individual college, with a minimum of 30 credits for specialisation within the main field of study. A further demand is a completed bachelor's degree; artistic bachelor's degree, professional degree of a minimum 180 ECTS credits or equivalent foreign degree.

Exception from the demand of a previous degree can be given for a student who has been accepted for the programme without having a basic qualification in the form of a degree. This however does not apply if on acceptance an exception has been made according to chap 7 § 28 second paragraph because the degree certificate has not yet been issued.

Objectives

Achievement and understanding

To gain a master's degree the student shall

- show achievement and understanding within the main field of study, including both a general view of the field as well as specialised attainment within certain sections of the subject along with an insight of current research and development work, and
- show advanced knowledge of method within the main field of study.

Skill and ability

To gain a master's degree the student shall

- show the ability to integrate knowledge and to analyse, form an opinion of and manage complex facts, problems and situations even with limited information,
- show the ability to independently identify and formulate problems as well as plan and with adequate methods carry out qualified tasks within a given time
- show the ability to report clearly both orally and in writing and discuss their conclusions and the knowledge and arguments which form the basis for these in dialogue with different groups, and
- show the skills needed to take part in research and development work or to be able to work in another qualified activity.

Assessment ability and attitude

To gain a master's degree the student shall

- show the ability to make judgements within the main field of study with consideration to relevant scientific, social and ethical aspects as well as show awareness of ethical aspects in research and development work,
- show insight into the possibilities and limitations of science, its role in society and mankind's responsibility for how it is used, and

- show the ability to identify their need of further knowledge and to take responsibility for their own development of knowledge.

Independent work (thesis)

To gain a master's degree the student shall within the framework of the course requirements have completed an independent work (degree thesis) of a minimum of 15 ECTS credits within the main field of study.

Other

For a master's degree with a particular direction the prescribed demands which each individual college has determined within the frame for the standards in this description shall also apply.

2.2 Particular objectives for the programme

The student shall obtain good knowledge, understanding and problem solving ability which means deepening and /or broadening of previous university studies.

After studies the student shall have the ability and skills for work which is largely autonomous and independent and that will be required to be able to be employed as an expert in geomatics related fields and/or for continued PhD studies.

The education shall have a high international standard and the degree received should be attractive internationally.

Ability and understanding

On completion of the education the student shall show

- ability and understanding within the field of geomatics with deepened knowledge in at least one of the fields geographic information technology (GIT) or geodesy,
- insight in relevant research and development within the field of Geomatics, and
- knowledge of advanced methods for managing and analysis of geographical data.

Skills and ability

On completion of the education the student shall be able to

- integrate knowledge from the field of geomatics and independently analyse, judge and manage complex problems,
- apply advanced methods,
- within a given time independently identify and formulate theoretical questions as well as plan and carry through advanced projects,
- both orally and in writing critically summarise the knowledge situation within the field of geomatics and neighbouring fields, including the latest results of research, and thereby give a correct and well balanced mixture of methods, results, conclusions and possible future application fields, and
- orally and through report writing on completed project work and in dialogue with both practioners and academics make clear the usefulness of the results.

Assessment ability and attitude

On completion of the education the student shall show,

- the ability to judge the effects of different methods from a technical and an environmental perspective,
- awareness of the ethical aspects of research and development work, and
- an attitude towards knowledge and life long learning which is characterised by an ability to be able to identify the need for further knowledge and a continued development of competence.

3 Programme description

3.1 Main field of study Geomatics

Geomatics is the collective name for individual academic disciplines, for example: photogrammetry, geodesy, land surveying, cartography, GIT, and remote sensing. The courses in this discipline are sometimes identical with courses in for example geography and spatial planning. Specialisation within the programme mainly deals with advanced uses or preparation for research courses in GIT and geodesy.

The programme consists of courses at both basic and advanced level. The breadth in the choice of courses offered allows for specialisation at an advanced level in one or two of the disciplines within geomatics. The courses given at basic level have two purposes. The first is to offer the opportunity for progression, that is students with insufficient knowledge in one of the disciplines in geomatics are given the possibility to catch up at basic level at the beginning of the programme and afterwards continue at advanced level. The other purpose is to offer students the chance to broaden knowledge in one or other of the subject's disciplines.

3.2 Tuition and examination

3.2.1 Tuition

The education is given through lectures, exercises, laboratory work, seminars and project work with guidance, Problem based project tasks are used with the purpose of stimulating the interplay between theory and practice and to increase the relevance of the education for the coming working life. In the final degree thesis the students are trained in working independently, both to show proof of their ability to choose relevant theories and methods and their problem solving ability

The progression within the programme allows for increased amounts of project based learning and where the learning outcomes are reached through factbased courses at basic level to pure project work at advanced level and in the thesis.

3.2.2 Examination

A variety of examination types are used in the programme courses: written examinations in the class room, tests done at home, work to be handed in,

seminars, project work, reports and oral tests. The choice of type of examination is governed by the content of the course with the ambition that the examination will function as a support for the learning process.

3.2.3 Degree thesis

The programme concludes with a degree thesis. In the thesis the students shall show that they can independently carry out a larger project, where they show proof of their ability to integrate knowledge from the main field and at the same time choose relevant methods and solve complex problems. Generally this means that the thesis involves applying, broadening and deepening knowledge from earlier studies. The student shall show through the thesis the objectives for a basic university education as given in the Higher Education Act, the goals for a master's education as given in the Higher Education Ordinance and the particular aims given in this education plan have been achieved. The thesis is done alone or in pairs. Only in exceptional cases larger groups can be accepted.

3.3 Student involvement

There are student representatives in the university governing board, the faculty board and in the institutions' governing bodies. Gefle Student Union selects the representatives.

3.4 Internationalisation

Within the field of geomatics there is the possibility for international exchange both for students and teachers. At the moment HiG has exchanges in geomatics with Curtin University and the University of Southern Queensland in Australia, Università degli Studi di Cagliari in Italy, Thompson Rivers University in Canada, Universidad de Extremadura and Universidad Politécnica de Valencia in Spain and Fachhochschule in Mainz and Fachhochschule in München in Germany. Both courses and thesis work are appropriate for study abroad. In the same way the geomatics programme can accept exchange students from the above colleges.

When there are exchange students, or non-Swedish speaking lecturers the courses in the programme are given in English. The course literature is usually in English. Judgement and acceptance of courses studied abroad is made by the Head of the division of Geomatics at the Department of Technology and Built Environment at HiG.

3.5 Technology and society

An important part of the education is to be able to see new technology from a social perspective. For this is needed knowledge of and skills in managing products, processes and the working environment with regard to mankind's conditions and needs and to the aims of society with respect to social conditions, the economisation of resources, environment and economy. On conclusion of the education the student should be able to take into account the human scientific and environmental demands when solving problems and have the prerequisites to work towards an environmentally adapted technology. The working methods which develop these abilities are, therefore, central to the education.

The programme is a freestanding continuation of the geomatics related 180 ECTS credit programme. The concentration of the courses allows for the possibility to study and work at the same time. This also makes it easier to study the programme from another place. Several of the courses are also given as distance courses.

4 Courses within the programme

Students have priority to courses within the programme. Students must apply for the courses in the following term. Changes in the order of the courses can be made after discussion with students active in the programme. Changes to the courses forming part of the programme are decided by the faculty board. Changes to the period when the courses are given are decided at institution level. An alternative choice of course can be made in discussion with the programme responsible with the condition that the objectives for the course are fulfilled.

There are two specialisations in the programme, one which focuses on GIT and the other towards geodesy.

B = Basic level

A = Advanced level

GIT course of studies

Period	Course name	Credits	Level	Main field of study
1:1	GIS raster/vector	7,5	B	Geomatics
1:1	Cartography 2	7,5	B	Geomatics
1:2	Spatial analysis and modelling	7,5	A	Geomatics
1:2	Remote sensing	7,5	A	Geomatics
1:3	GIT – Project	7,5	A	Geomatics
1:3	Time – GIS	7,5	A	Geomatics
1:4	Thesis	15	A	Geomatics

Geodesy course of studies

Period	Course name	Credits	Level	Main field of study
1:1	Field Training in Geodetic Engineering	7,5	B	Geomatics
1:1	GIS raster/vector	7,5	B	Geomatics
1:2	Advanced satellite geodesy	7,5	A	Geomatics
1:2	Geodetic reference systems	7,5	A	Geomatics
1:3	Engineering Surveying– outdoor	7,5	A	Geomatics
1:3	Industrial and special measurements	7,5	A	Geomatics
1:4	Thesis	15	A	Geomatics

The final thesis is written in the main subject field of geomatics. The demand for a thesis at advanced level is specified in the University's outlines for a degree thesis.

5 Qualification

Those qualified to be accepted for the Master's degree programme in Geomatics are those who have completed a degree of a minimum of 180 ECTS credits in a geomatics related field at a Swedish University or have an equivalent foreign degree.

6 Grades

Grades are awarded on the courses included in the programme according to the respective course curriculum.

7 Degree regulations

7.1 Degree title

Degree of Master of Science (One Year) with a major in Geomatics.

7.2 Degree criteria

To receive the master's degree students need, besides the education at basic level of a minimum of 180 ECTS credits, to have completed courses of 60 ECTS credits according to this study plan, of which at least 45 ECTS credits are for specialisation in courses at advanced level in the main subject Geomatics where at least 15 of these points are for a degree thesis at advanced level.

For a technology master's degree it is necessary that the student altogether must also have completed courses of at least 30 ECTS credits in mathematics, alternatively 22,5 credits in mathematics and 7,5 credits in applied mathematics.

7.3 Degree certificate

Students who fulfil the requirements for the degree shall on request receive a degree certificate. Every degree certificate will be accompanied by a degree supplement which describes the education and its position in the education system (Higher Education Ordinance chap 6 § 15) The supplement is called the Diploma Supplement. The Diploma Supplement will ease acknowledgement of a Swedish degree for employment and for continued studies in Sweden or abroad.

8 Other regulations

For students who have had an interruption of studies a special syllabus is created by the programme responsible in consultation with the student.

Judgement of and acceptance of courses which have been studied elsewhere are made by the Head of the division of Geomatics at the Department of Technology and Built Environment at HiG.