



UNIVERSITY OF GÄVLE

STUDY PLAN

BASIC LEVEL

STUDY PROGRAMME FOR A DEGREE OF
BACHELOR OF SCIENCE IN GEOMATICS

Programme code: TGGEB

Confirmed by NT board 2007-03-13

Revised by the NT-board 2008-10-28

Study Programme Syllabus

Study Programme for a Degree of Bachelor of Science in Geomatics, 180 ECTS credits

This study plan applies to those students admitted autumn term 2010 or later.

**STUDY PROGRAMME FOR A DEGREE OF BACHELOR OF
SCIENCE IN GEOMATICS
University of Gävle**

1 General Organisation

The study programme in Geomatics combines courses towards a Bachelor's degree in Geomatics which experience shows the labour market to be interested in. The programme has a pronounced structure where the levels of project based learning steadily increase from more factual based knowledge to pure projects and the final thesis. The programme is given entirely in English.

2 Objectives

2.1 Objectives for higher education at foundation level according to the Higher Education Act chap 1. § 8 and examination description according to the Higher Education Ordinance section 2

2.1.1 Objectives for higher education at foundation level according to the Higher Education Act, chap1. § 8.

Education at foundation level shall chiefly be based on the achievement which pupils have reached from the national or specially formed programmes in upper secondary school or equivalent studies. The government may, however, allow exceptions where artistic education is concerned.

The education at foundation level shall develop the students

- ability to make independent and critical judgements
- ability to independently distinguish, formulate and solve problems and
- readiness to meet changes in working life

Within the field for which the programme is intended the students shall, besides skill and proficiency, develop the ability to

- find and evaluate knowledge at a scientific level
- follow the development of knowledge and
- exchange knowledge even with persons without specialist skills within the subject area

2.1.2 Examination description according to the Higher Education Ordinance section 2

Bachelor's degree

Extent

The bachelor's degree is attained after the student has completed the course requirements of 180 ECTS credits with particular focus decided by the individual college, of which at least 90 ECTS credits will be for gradual specialisation within the main field of study.

Objectives

Achievement and understanding

To gain a Bachelor's degree the student shall

- show achievement and understanding within the main field of study, including knowledge of the field's scientific basis, knowledge of suitable methods within the field of study, specialisation within a part of the area as well as information about ongoing research

Proficiency and ability

To gain a Bachelor's degree the student shall

- show the ability to seek, collect, evaluate and critically interpret relevant information in an approach to a problem as well as critically discuss facts, problems and situations
- show the ability to independently identify, formulate and solve problems as well as carry out tasks within a given time scale
- show the ability to both orally and in writing report on and discuss information, problems and solutions in conversation with different groups, and
- show the skill required to work independently within the area of study that the course involves

Assessment ability and attitude

To gain a Bachelor's degree the student shall

- show the ability to make judgements with regard to relevant scientific, social and ethical aspects within the main field of study
- show insight into the role of knowledge in society and of mankind's responsibility for how it is used and
- show the ability to identify the need for further knowledge and to develop competence

Independent work (thesis)

To gain the Bachelor's degree the student shall, within the framework of the course, have completed an independent work (thesis) of at least 15 ECTS credits within the main field of study.

Other

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

2.2 Particular objectives for the programme

The aim of the course is to develop knowledge and experience based competence to collect, make use of and present landscape information with the assistance of advanced computer technology. The course also aims to give incisive competence within some of the following areas: geodetic surveying or geographic information technology.

Knowledge and understanding

After completed studies the student shall have understanding and knowledge in

- geodesy, photogrammetry, cartography, geographic information technology (GIT) and mathematics
- the use of modern instruments and programme software within the main field of geomatics
- working with and carrying out projects

Proficiency and ability

As a result of the course the student shall have developed the skill and ability to

- understand the need of society for geographical information
- use modern geographical information technology
- use and evaluate different methods of working
- show an ability to work in the different roles required in project work
- present results both orally and in writing

Assessment ability and attitude

On completion of the course the student shall

- show the ability to make judgements of the methods of working within the main field of study
- have knowledge and insight of ethical values and issues within the main field of study

3 Programme description

3.1 Main field of study

3.1.1 Main field of study Geomatics

The programme consists of the main field of study Geomatics which is an internationally accepted comprehensive term for individual academic disciplines concerning geographical information. These comprise: photogrammetry, geodesy, surveying, cartography, GIT and remote sensing. In GIT, GIS (geographical information systems) plays a central role as an effective tool. Courses in these disciplines are sometimes identical with courses in geography and spatial planning

3.1.2 Thesis

The programme concludes with a bachelor's thesis. In the thesis the student shall show that they can independently carry out a bigger project where they both show proof of the ability to integrate knowledge from the areas studied and to choose relevant methods for solving complex problems. Generally it is important that in the thesis knowledge from earlier studies is applied, broadened and deepened. Students shall show through their thesis that those goals for a basic university education as given in the Higher Education Act and the Bachelor's degree education as given in the Higher Education Ordinance and the special goals stated in this course of teaching have been achieved.

3.2 Tuition and examination

3.2.1 Tuition

The pedagogical approach is based on all learning being an active dynamic process that is carried out in co-operation between teacher and student. All teaching and tutoring presupposes that the student takes responsibility for studies and the search for knowledge. Learning implies that the theoretical and practical elements of the courses will be integrated to useable knowledge and proficiency for every individual. In this way the student is given the possibility for personal development which is of great value for a forthcoming career and a life-long learning. Students should also be prepared for changes and the ability to re-evaluate their proficiency in order to be able to actively participate in the development and evaluation of the profession's area of competence. Different teaching and types of working will train the student in an active search for knowledge, critical thinking and reflection, practice in expression in speech and writing and the ability to make use of scientific literature.

Progression within the programme is maintained through successive in-depth studies in the chosen field of technology both through advanced subject studies and the development of a scientific approach. The programme also provides the qualification for continued studies for a master's degree.

3.2.2 Examinations

Within the programme's courses varying forms of examination are applied. The types of examinations are adapted to the demands of the different courses. There are written and oral tests, both individual and group. The type of examination, its extent and duration is adapted to the expected learning outcome indicated in the respective course. Examinations will also be related to the demands of working life for proven knowledge and proficiency.

3.3 Student involvement

There are student representatives in the university governing board, the faculty and research board and in the institution's governing body. Gefle Student Union elects the student representatives.

3.4 Internationalisation

The study programme for a BSc in Geomatics recruits both national and international. All teaching is carried out in English. The programme has at present exchanges with the universities of Guizhou, Sichuan and Jilin in China.

Generally within the area of geomatics there is possibility for international exchanges for both students and teachers. The University of Gävle (UG) has at present exchanges in geomatics with Curtin University of Technology and the University of Southern Queensland in Australia, Università degli

Studi di Cagliari in Italy, Thompson River University in Canada, Universidad de Extremadura and Universidad Politecnica de Valencia in Spain and Fachhochschule in Mainz and Fachhochschule in Munich in Germany. Both the courses and degree project work are suitable for study abroad. In the same way UG can accept exchange students from these colleges.

When there are exchange students present or non-Swedish speaking lecturers the courses in the programme are given in English. The course literature is usually in English. Assessment of and inclusion of the courses which are taken abroad are made by the subject representative in geomatics at the Institute for Technology and Built Environment at UG.

3.5 Technology and society

An important starting point for the programme is that through the Degree of Bachelor of Science in Geomatics course the student must be able to see new technology from a social point of view. Students need knowledge of and proficiency in managing products, processes and the work environment with regard to mankind's requirements and needs, and to society's aims regarding social conditions, resources, environment and economy. On completion of the course the student should be able to take into account the human scientific and environmental demands when solving problems and developing programmes, and has the prerequisites to work for an environmentally adapted technology. The working methods that practise these abilities are therefore central to the programme.

4 Courses within the programme

Students have guaranteed places for the courses within the programme. Applications for the courses for the forthcoming term should be made. Changes in the order of the courses can be made after discussion with students active in the programme. The faculty board decides on changes to the study programme's courses. Changes to the period when the courses are given are decided at institution level. Alternative course choices can be made after consultation with the person responsible for the programme with the condition that the objectives for the programme are fulfilled.

B = basic level (courses within the programme at foundation level).

Year 1

Period	Course name	Credits	Level	Main field of study
1	Introduction to Higher Studies	15	B	Technology
2	Geographical Information Technology	7,5	B	Geomatics
2-3	Engineering Mathematics	15	B	Mathematics
3	Basic Cartography	7,5	B	Geomatics
4	Basic Land Surveying	7,5	B	Geomatics
4	Multivariate Calculus	7,5	B	Mathematics

Year 2

Period	Course name	Credits	Level	Main field of study
1	GIS Raster/Vector	7,5	B	Geomatics
1	Advanced Engineering Mathematics	7,5	B	Mathematics
2	Digital Fotogrammetry	7,5	B	Geomatics
2	Remote Sensing and GIS Analysis	7,5	B	Geomatics
3	Environmental Geography	7,5	B	Geography
3	Programming in Visual Basic	7,5	B	Computer Science
4	Geodetic Instruments	7,5	B	Geomatics
4	GIS Databases	7,5	B	Geomatics

Year 3

Period	Course name	Credits	Level	Main field of study
1	Geovisualisation in Build Environment or Field Training in Land Surveying	7,5	B	Geomatics
1	Spatial Planning in Land Management	7,5	B	Spatial planning
2	GIS Application Development	7,5	B	Geomatics
2	Geodetic Theory of Errors	7,5	B	Geomatics
3	Engineering Surveying or Web Mapping	7,5	B	Geomatics
3	Scientific Writing	7,5	B	Geomatics
4	Bachelor's Thesis	15	B	Geomatics

5 Qualification

Those who qualify to be admitted to the Bachelor of Science programme in Geomatics are those who fulfil the conditions for basic qualification as given in the Higher Education Ordinance as well as the following particular qualifications (or equivalent), specific entry requirements 8,

Subject	Swedish High School Course
Mathematics	Ma D
Physics	Phys B
Chemistry	Chem A

The grade in every one of the above subjects must be a minimum Pass level.

6 Grades

Grades are set on the courses included in the programme according to the current curriculum.

7 Degree regulations

7.1 Degree title

Degree of Bachelor of Science in Geomatics.

7.2 Degree criteria

In order to obtain a Degree of Bachelor of Science in Geomatics all the courses given in the syllabus must be completed.

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 supplement, which describes the programme and its position in the education system (Higher Education Ordinance chap 6 §15). The supplement is called the Diploma Supplement. The Diploma Supplement will make acknowledgement easier and count as a Swedish degree on employment and for continued studies both in Sweden and abroad.