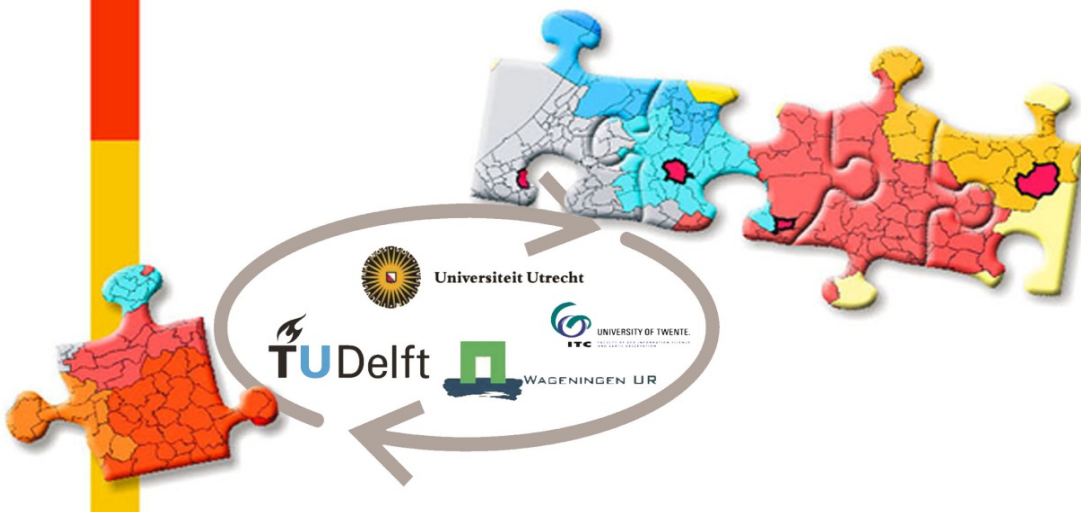


# GIMA

Geographical Information Management and Applications

## Course Catalogue

2013-2014





# Course Catalogue

Master of Science  
Geographical Sciences

Geographical Information Management and Applications\*

Delft University of Technology (TUD)  
University of Twente (UT) - ITC  
Utrecht University (UU)  
Wageningen University (WUR)

**YEAR 2013-2014**

August 2013

\*This MSc programme is officially registered by the Utrecht University under the name Geographical Sciences (CROHO 60732)

## Preface

This course catalogue describes the Master of Science programme 'Geographical Information Management and Applications' (GIMA), officially registered as the Master' degree programme 'Geographical Sciences' at Utrecht University (CROHO 60732) for the academic year 2013-2014.

The catalogue starts with an insight into the GIMA organization, and some practical information. The programme has a modular structure, and uses a blended learning concept. Blended learning means a mixture of periods of face-to-face contact and distance education. The face-to-face periods are required periods of attendance, so please keep an eye on the overview with required periods of attendance for the current year on p. 15.

The first section of the catalogue (Part I: GIMA Course Guide) gives an overview of the course. It includes the details of all course modules like name, code, time-slot, credits, coordinator and involved lecturers, learning objectives and content, type of education, assessment procedure, entry requirements and literature. The module information may be subject to some change. Therefore, during the programme, each module coordinator will provide you with a course guide to update (if necessary) the module information. The GIMA Blackboard site ([blackboard.utwente.nl](http://blackboard.utwente.nl)) will always offer the most up-to-date information. Change in a module described in a course guide overrules the module information in the course catalogue. Part I further presents GIMA staff, the venues - including route descriptions- and some frequently asked questions and answers.

The formal rights and obligations related to the programme follow in Part II: GIMA Regulations. The first two sections contain regulations that are applicable to all the Masters degree programmes of the Faculty of Geographical Sciences, Utrecht University: the Teaching and Examination Regulations, and the Regulations of the Board of Examiners. The last section contains the *additional* Teaching and Examination Regulations of the GIMA programme. Please note that specific GIMA Internship Regulations and Master Thesis Regulations have been added to the respective module descriptions.

Hopefully this GIMA catalogue provides you with answers to the most important questions you have as a student with respect to your GIMA studies. For additional questions and remarks, please do not hesitate to contact me or the GIMA secretary ([gima@geo.uu.nl](mailto:gima@geo.uu.nl)) directly.

Good luck and enjoy the GIMA studies!

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GIMA Programme Director  
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*Geo-Information Processing Department  
Faculty of Geo-Information Science and Earth Observation (ITC)  
University of Twente*

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# **Part I: GIMA Course Guide**

## General information

This chapter gives an overview of the organization and administrative structure of the GIMA studies and student facilities.

### GIMA Management

The management of GIMA consists of a Programme Board, a Programme Director; an Examination Committee and a Programme Committee (see **Error! Reference source not found.**below). The GIMA Secretary supports their functions. The contact details for the members mentioned hereafter can be found in the staff information section.

#### Programme Board

Prof. Dr. Menno-Jan Kraak (UT-ITC)  
 Prof. Dr. Ir. Arnold Bregt (WUR)  
 Dr. Stan Geertman (UU)  
 Prof. Dr. Ir. Peter van Oosterom (TUD)

#### Programme Director

Dr. Corné van Elzakker (UT-ITC)

#### Examination Committee

The Examination Committee is responsible for the assessment and determination of the results of exams, upholding the module rules and handing out the MSc degree in a public meeting. The Examination Committee is also responsible for giving exemptions to modules or regulations. Letters and requests to the Examination Committee can be sent via the chairman.

Members:

Prof. Dr. Ir. Arnold Bregt (WUR, chairman)  
 Dr. Stan Geertman (UU)  
 Prof. Dr. Menno-Jan Kraak (UT-ITC)  
 Prof. Dr. Ir. Peter van Oosterom (TUD)

#### Admission Committee

Dr. Corné van Elzakker (UT-ITC, Chair)  
 Dr. Stan Geertman (UU)

#### Programme Committee

The Programme Committee consists minimally of four staff members and four student members.

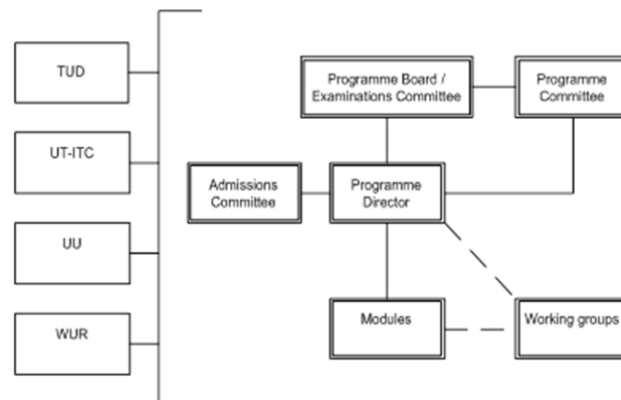
Members:

Dr. Bastiaan van Loenen (staff, TUD, chair)  
 Ir. Ellen-Wien Augustijn (staff, UT-ITC)  
 Dr. Ir. Arend Ligtenberg (staff, WUR)  
 Drs. Fred Toppen (staff, UU)  
 Joey Figiel (student, 2011)  
 Jasper Hogerwerf (student, 2010)  
 Robert-Jan Geldhof (student, 2012)  
 Martijn Snelder (student, 2010)  
 Sanne van der Neut (student, 2012, GIMA secretary)

#### GIMA Secretary

Sanne van der Neut

Any questions regarding this Course Catalogue or other facets of GIMA may be directed to the GIMA Secretary, over e-mail. The e-mail address is [gima@geo.uu.nl](mailto:gima@geo.uu.nl).



Organizational structure from a student's perspective



## Student facilities

As a GIMA student you are registered at Utrecht University (UU), this means that the facilities of the Faculty of Geosciences of UU are accessible for GIMA students. Most questions regarding UU facilities can be addressed at: [gdesk.uu.nl](mailto:gdesk.uu.nl) (both English and Dutch). For access to facilities at other universities, application forms are available at that specific institute.

### Library

As a GIMA student you are entitled to the use of the UU library. On the Internet ([www.library.uu.nl](http://www.library.uu.nl)) more information can be found about the locations of the libraries in Utrecht. Scientific articles are accessible via myuu.nl (use your UU student number and password). Furthermore, you can lend literature at the libraries of the participating universities. If this is desired, please contact the GIMA secretary ([gima@geo.uu.nl](mailto:gima@geo.uu.nl)).

### VPN

Access to libraries or datasets can be enhanced when you have a VPN connection. Once a year Maarten Zeylman organizes a workshop on how to connect through VPN with your own laptop and on how to access data.

## Housing

Students who plan on staying in the Netherlands for the entire duration of the programme can request to arrange housing via the international office of UU ([international@geo.uu.nl](mailto:international@geo.uu.nl)). But arranging housing yourself somewhere else in the Netherlands is also possible. For hotels to stay specifically during the contact days students may ask the GIMA secretary about the cheapest locations in the neighbourhood of the participating institutions.

### Social life

Foreign students staying in the Netherlands during the entire GIMA programme receive information about the Erasmus Student Network (ESN) together with their acceptance letter. This will help students to overcome any cultural differences and to establish a social network in the Netherlands. Also Utrecht has a very active entity of the European Geography Association for students and young geographers (EGEA), which organizes a lot of extra-curricular activities.

## Computers & computer facilities

Due to the blended-learning nature of the GIMA Master programme, all students are required to have a laptop, starting their first day at GIMA in September. This needs to have the required processing power, necessary for the execution of the software used during the master. An indication of the laptop specifications required are given below. It is also important to mention that service and computer help at the universities, as well as most of the software needed during the master course, is based around Windows operating systems. Although you are free to make your choice of laptops, you need to be aware that services and software often might not work for, for instance, a Mac.

### Laptop specifications:

#### Hardware requirements:

Processor	Dual core processor, W.E.I of at least 5.5
Memory	4 GB or more
Graphics	W.E.I of at least 3.5
Disk	C: drive must be 75GB of which 30 GB has to be available
Screen	Resolution of at least 1366 x 768

**Processor:** If your computer does not have a dual core processor than it will not be approved. In most laptops you cannot update your processor. Your processor should have a Windows Experience Index of at least 5.5. You can check this in the windows control panel.

**Memory:** At least 4GB of memory should be installed. Most laptops allow additional memory to be installed so that you can expand your memory if required.

**Graphics:** Your graphics adapter should have a Windows Experience Index of at least 3.5. Most recent laptops fulfill this requirement. You can check this index in the windows control panel.

**Disk:** Your C: drive should be at least 75 GB and have 30 GB of disk space available. You can free up disk space on your C: drive by uninstalling unnecessary software and moving data to an external drive.

**Screen:** Your screen resolution should be at least 1366 by 768 pixels. You can change your screen resolution from the windows control panel. Most recent laptops have this resolution available

Operating system requirements:

Version	Windows 7 or Windows 8 64 bit
Language	English or Dutch
Antivirus	Must be installed
Automatic updates	Must be enabled

**Version:** Only Windows 7 or Windows 8 is supported. If you do not have this windows version then please upgrade your windows. You should have the 64 bit version of windows installed to be able to use the full capacity of your memory.

**Language:** Only the English and Dutch version of windows can be supported. Some windows versions allow the installation of language packs from Windows Update. In this way you can switch between languages and you do not have to reinstall your windows.

**Antivirus:** An antivirus is required on your system. You can install a free antivirus from Microsoft, Security Essentials which can be downloaded from the Microsoft web site.

**Automatic updates:** Automatic updates should be enabled to make sure you have the latest security patches installed. This can be configured in the windows control panel.

**Computers available at the Universities**

It is also possible to get access to computers in labs of the different universities. At the universities of Utrecht and Wageningen, computers with GIS software can be accessed. To receive a login for Wageningen, you must enrol as a minor student at Wageningen University. You can do so by requesting a "bijvakkersformulier" from the Wageningen University website ( <http://www.wageningenur.nl/en/Education-Programmes/BSc-Minors/Minors-for-external-students.htm> ). Login for the GIS-lab (Willem van Unnik building, room 422) in Utrecht, can be obtained via Maarten Zeylmans ([m.j.zeylmansvanemichoven@uu.nl](mailto:m.j.zeylmansvanemichoven@uu.nl)).

**Registration of marks: Osiris (accessible via <http://www.osiris.universiteitutrecht.nl> )**

Osiris is the education registration system of Utrecht University. Via the Internet you can log in and see your **official marks**. For login you have to use your UU student number and password.

**Blackboard (<http://blackboard.utwente.nl> )**

Blackboard is the education platform we use and runs via the University of Twente. It will be used extensively in GIMA. Via the Internet you can log in with the username (student number) and password you have received from UT-ITC. This system will be used for all GIMA modules; here you can find information on the modules, lectures, a discussion board, the most current regulations, etc. It is also used for communication between staff and students, either via email or announcements in the general Blackboard module. The GIMA General Information module contains information that is not specific for a particular GIMA module. Amongst others, the timetables of the contact days are published here. The course catalogue is also accessible via the GIMA General Information module.

Each module of GIMA has its own Blackboard space. The naming convention is as follows: GIMA / [Course year] / [module number] / [module name]. This means that each year a new module will be created for every module. The only exceptions to this rule are module 7 and 8. These remain the same every year, but are continuously updated. All registered GIMA course participants have access to BB module 8 (right from the start of the GIMA programme) where you can find, for instance, all GIMA theses which have been produced over the past 10 years, newly suggested thesis research topics plus an overview of the current GIMA thesis researchers and their topics.

If you don't have access to a certain module you may contact the GIMA secretary at [gima@geo.uu.nl](mailto:gima@geo.uu.nl).

#### Student mail

As a GIMA student you receive two email accounts, one from the University of Utrecht and one from the University of Twente. As the UT account is linked to Blackboard, this account will mostly be used for communication between students and GIMA staff. Check your UU mail often for general notifications regarding your official registration.

#### Student Service Centre

GIMA students can turn to the Student Service Centre of Utrecht University for information, advice and services on studying. The service centre is located in *Bestuursgebouw* at Heidelberglaan 8, Utrecht. Also you can submit questions regarding admission requirements and registration via the Internet on <http://qdesk.uu.nl>

#### Surfspot

You are entitled to buy software at a discount at Surfspot (<http://www.surfspot.nl/>) or directly at the Faculty of Geosciences (<http://geo-ict.geo.uu.nl/software/surfspot.htm>) (the last one has a limited selection of software). For login, use your UU student account.

#### Educational Software

As a GIMA student you will acquire a student license of ArcGIS (ESRI). This license includes the extensions Spatial Analyst, Geostatistical Analyst and 3D Analyst. Furthermore, during some modules additional software packages will be provided, depending on the chosen subject.

## Other practical information

More comprehensive information is to be found in the manual on administrative procedures (also called the manual for registration and access to the services on the various institutes) on Blackboard, or at our website [www.msc-gima.nl](http://www.msc-gima.nl).

### Registration

Since four universities are involved in the GIMA programme, the registration procedure might be confusing for prospective students. The following needs to be done: a student will first apply for the MSc GIMA via Studielink ([www.studielink.nl](http://www.studielink.nl)); see for details the GIMA manual for all service and registrations on [www.msc-gima.nl](http://www.msc-gima.nl)). The student will receive (if accepted) a letter of acceptance or conditional acceptance. A confirmation letter is attached as well. Please send this confirmation letter back as soon as possible to confirm that you are going to attend GIMA. With the letter of (conditional) acceptance, the student can register him/her-self at Utrecht University. Payment of the tuition fees is part of the registration.

### **IMPORTANT – RE-REGISTRATION IS REQUIRED EACH YEAR!**

Re-registration by Studielink at the university has to be done **every year**, before August 31<sup>st</sup>. Failing to do so can have serious consequences for your participation in the programme (e.g. module results will not be filed because they become invalid, educational support and course facilities will not be available). Questions regarding re-registration can be asked via [www.qdesk.uu.nl](http://www.qdesk.uu.nl)

**!!! Please note that registration at the university is different from registration for a module via Blackboard !!!**

### Completion of MSc GIMA programme

Upon completion of the GIMA programme, you can apply for graduation by filling the form here: [http://www.formdesk.com/universiteitutrecht/GEO\\_applyforMAGraduation](http://www.formdesk.com/universiteitutrecht/GEO_applyforMAGraduation). You can use the form to indicate how you would like to receive your diploma: in a graduation ceremony, or sent by mail carrier. Wait with de-registering till you have received a confirmation!

### Termination of the MSc GIMA Programme

If, for some reason, you choose to stop with GIMA while you have not finished the entire programme, it is possible to request for a certificate of the completed modules. Request this at the Utrecht University student administration.

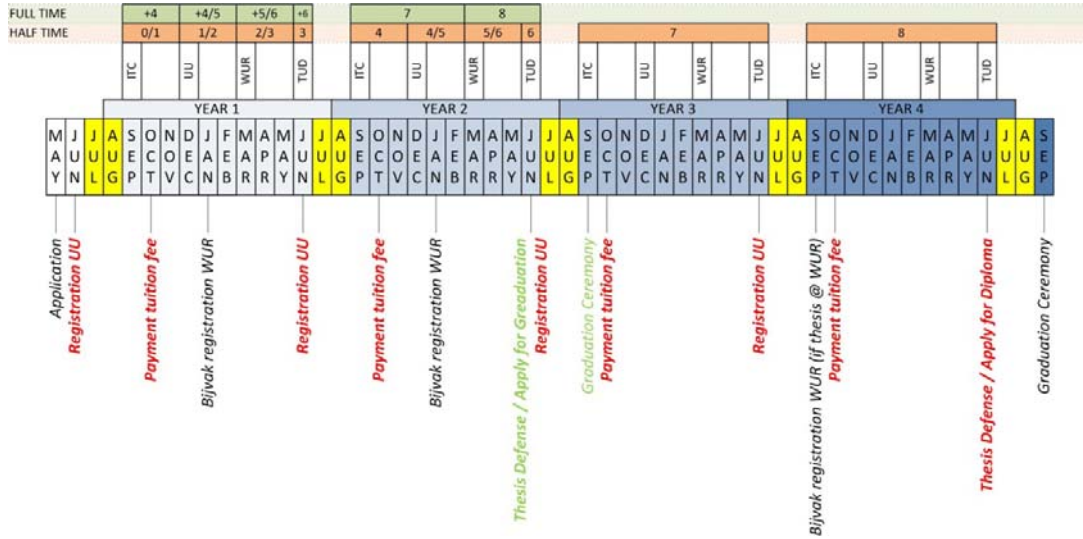
### Tuition fee refund

It is possible to get a refund of part of your tuition fee if you finish the MSc programme before the end of the academic year. You are advised to have a look at the [www.qdesk.uu.nl](http://www.qdesk.uu.nl) website; the steps required to stop with GIMA and possibly have a refund of tuition fees are all described there.

**Registration overview**

Additionally, registration at Wageningen University is needed to access the systems over there, or when you receive thesis or internship supervision from a staff member working at Wageningen University. This takes usually place in January. To summarize all registration moments, see the Figure below.

The flow diagram for re-enrolment can be found on <http://www.msc-gima.nl/uploads/images/ProcedureNew2011.pdf> as the scheme is too large to display.



Registration overview

**Required periods of attendance: academic year 2013 – 2014**

<b>GIMA schedule 2013 – 2014</b>				
<b>Week</b>	<b>Date</b>	<b>Activity</b>	<b>Where</b>	
<b>36</b>	<b>3 September 2013</b>	<b>GIMA introduction</b>	<b>ITC/UT Enschede</b>	
	<b>4 September 2013</b>			
	<b>5 September 2013</b>			
	<b>* 6 September 2013</b>			
<b>37</b>	<b>9 September 2013</b>	<b>Module 1 start</b>		
	<b>10 September 2013</b>	<b>Module 4 start</b>		
	<b>11 September 2013</b>			
	<b>12 September 2013</b>			
	<b>13 September 2013</b>			
38-42	Distance Learning			
43	<i>No Teaching</i>			
44-49	Distance Learning			
<b>50</b>	<b>9 December 2013</b>	<b>Module 1 end</b>		<b>Utrecht University</b>
	<b>10 December 2013</b>			
	<b>11 December 2013</b>	<b>Module 4 end</b>		
	<b>12 December 2013</b>			
	<b>13 December 2013</b>			
<b>51</b>	<b>** 16 December 2013</b>	<b>Module 2 start</b>		
	<b>17 December 2013</b>			
	<b>18 December 2013</b>	<b>Module 5 start</b>		
	<b>19 December 2013</b>			
	<b>20 December 2013</b>			
52-1	<i>No Teaching</i>			
2-12	Distance Learning			
<b>13</b>	<b>24 March 2014</b>	<b>Module 2 end</b>	<b>Wageningen University</b>	
	<b>25 March 2014</b>			
	<b>26 March 2014</b>	<b>Module 5 end</b>		
	<b>27 March 2014</b>			
	<b>** 28 March 2014</b>			
<b>14</b>	<b>31 March 2014</b>	<b>Module 3 start</b>		
	<b>1 April 2014</b>			
	<b>2 April 2014</b>	<b>Module 6 start</b>		
	<b>3 April 2014</b>			
	<b>4 April 2014</b>			
15-18	Distance Learning			
19	<i>No Teaching</i>			
20-26	Distance Learning			
<b>27</b>	<b>30 June 2014</b>	<b>Module 3 end</b>	<b>TU Delft</b>	
	<b>1 July 2014</b>			
	<b>** 2 July 2014</b>	<b>Module 6 end</b>		
	<b>3 July 2014</b>			
		<b>4 July 2014</b>		<b>Module 8 introduction</b>

\* Midterm presentations

\*\* Midterm presentations and defences

## The Programme

Geographical Information Management and Applications

(See also: [www.msc-gima.nl](http://www.msc-gima.nl))

### Content

There are a number of special features that give the GIMA programme a unique character: a large part of the programme is offered as distance learning. Only the first and the last week of each module are classroom learning. The remaining time you will work from your home or office, whether in the Netherlands or somewhere else. The interactivity will be guaranteed by the use of electronic communication (Blackboard e-learning environment and other means) by which you regularly interact with your teachers and fellow students. The use of various ICT means and didactic tools add to the attractiveness of the programme.

The programme has a high degree of flexibility and “knowledge on demand”. The programme is developed in co-operation between four renowned universities, each with its own tradition:

- Utrecht University (UU), with a focus on geography and planning;
- Delft University of Technology (TUD), with a focus on the legal, organizational and technical aspects of geo-information handling with an emphasis on large scale applications;
- the Faculty of Geo-Information Science and Earth Observation of the University of Twente (UT-ITC), with a focus on technical and application oriented courses, all dealing with GIS and Remote Sensing, mainly for developing countries;
- Wageningen University (WUR), with a focus on geo-information items related to land use, agricultural and rural applications.

The different approaches of the four universities will provide you with an optimal mix of GIS knowledge and skills.

The programme is offered in a full-time mode of 2 years (study load approx. 40 hrs per week) and a part-time mode of 4 years (study load approx. 20 hrs per week).

If you want to join the GIMA programme you have to meet these requirements:

- Bachelor degree in relevant field of science;
- Academic skills on par with those expected at the level of a *university* Bachelors’ degree;
- Basic knowledge of and practical experience in geo-information;
- English language proficiency (the MSc programme is an international programme; therefore, education will be offered in English).

### Aim and learning outcomes

The aim of this inter-university MSc-GIMA programme is to educate suitable candidates to become highly skilled and all-round geo-information managers and/or application specialists. Therefore, the candidates will be introduced into the theoretical, methodological, technological, and organizational principles of working with geographical information (GI), together with the use of GI-technology in spatial applications. The learning outcomes are described below.

The graduate is able to:

#### DOMAIN SPECIFIC

1. Identify and understand geo-information concepts, methods and techniques.
2. Use appropriate concepts, methods and techniques for the management and application of geo-information.
3. Analyze the quality and usability of geo-information processes.
4. Evaluate solutions for societal problems by applying knowledge of geo-information.
5. Design and implement proof-of-concept geo-information-based solutions for societal problems.

**SCIENTIFIC**

6. Independently formulate and execute research in accordance with academic standards within the field.
7. Communicate clearly (both orally and in writing) with specialists and non-specialists to present and discuss the outcomes of research and design projects.
8. Show awareness of the need to keep in touch with relevant developments within the discipline and show the ability to recognize, understand and apply new concepts and approaches as they emerge.
9. Demonstrate understanding of the moral and ethical dimensions of scientific research and its applications, and the importance of intellectual integrity.

**GENERAL LEARNING OUTCOMES**

10. Effectively organize, structure and plan phases in multidisciplinary teamwork.
11. Critically reflect on own performance and results, as well as on those of colleagues.
12. Design and plan a path to study in Geo-Information Science in a manner that is largely self-directed or autonomous.

**Labour market perspectives**

The MSc-GIMA programme aims at educating students to become all-round managers of geo-information or all-round geo-information application specialists. They will work in the private sector (utilities, oil companies, geo-marketing, consulting), the public sector (research institutes, municipalities, central and regional government services) and all combinations of these two. In recent years the demand for managers and application specialists in geo-information on the professional GIS market increased enormously.

With the MSc programme Geographical Information Management and Applications (GIMA) you can qualify for these professions, as you will acquire:

- Knowledge and skills of management; 'how to manage geo-information (projects/organizations)',
- Knowledge of geo-information application fields; 'where to apply geo-information',
- Technological and methodological geo-information skills; 'how to use geo-information technology'

**Programme Structure**

The programme can be followed full time or halftime

The programme consists of six modules: 1) basic GI-methods and tools; 2) basic GI-applications; 3) management in organizations; 4) management of GI-projects; 5) advanced GI-methods and tools; 6) advanced GI-applications. Thereafter the MSc-GIMA programme consists of an internship and of a MSc-thesis.

half-time	week 36	week 37 - 50	week 51 - 13	week 14 - 27	full-time
year 1	<i>Introduction</i>	<i>Module 1 methods and techniques</i>	<i>Module 2 basic applications</i>	<i>Module 3 management in organisations</i>	year 1
year 2		<i>Module 4 project management</i>	<i>Module 5 advanced methods and techniques</i>	<i>Module 6 advanced applications</i>	
year 3	<i>Internship / MSc Thesis</i>				year 2
year 4	<i>MSc Thesis / Internship</i>				



In the Osiris course list (Utrecht University course system) you will find the following codes and names:

Course code	Title	ECTS-credits
GEO4-GIMA1	Basic methods and techniques	10.0
GEO4-GIMA2	Basic applications	10.0
GEO4-GIMA3	Management in organizations	10.0
GEO4-GIMA4	Project management	10.0
GEO4-GIMA5	Advanced methods and techniques	10.0
GEO4-GIMA6	Advanced applications	10.0
GEO4-GIMA7	Internship GIMA	30.0
GEO4-GIMA8	Master thesis GIMA	30.0

*Additional information on the courses is available on the web ([www.msc-gima.nl](http://www.msc-gima.nl)) and on Blackboard (<https://blackboard.utwente.nl>). At the start of the course in Enschede you will receive a login for Blackboard.*

### **Relationship between learning outcomes and module objectives**

The table on the following two pages illustrates how the objectives of each of the modules (which are described in the next section) relate to the GIMA learning outcomes.

Course (module) objectives			GIMA programme learning outcomes														
			1	2	3	4	5	6	7	8	9	10	11	12			
No.	Code	Course	The graduate will / will be able to:	Domain-specific learning outcomes					Scientific learning outcomes			General learning outcomes					
1	GEO4-GIMA0	Introduction	Gain understanding of the nature of the GIMA course														
2	M0		Understand that different approaches toward geo-informatics are possible	X													
3	M0		Understand why geo-information is needed to solve problems			X	X										
4	M0		Obtain practical knowledge on how to use learning and communication tools the GIMA distance-learning mode														X
5	M0		Improve GIS skills		X												
1	GEO4-GIMA1	Basic Methods and Techniques	Describe and understand the basics of the geo-information process, including the role of data modelling	X	X					X					X		
2	M1		Understand the principles of data acquisition (including an introduction in Remote Sensing), data storage, data analysis, and visualization technologies	X	X					X					X		
3	M1		Understand the basics of quality issues of geo-information	X	X					X					X		
4	M1		Apply basic methods in handling geo-information using the ArcGIS software	X	X												
5	M1		Apply basic skills in searching and validating scientific literature							X						X	
6	M1		Analyse basic problems, decide on solutions and summarize findings in a technical report		X	X					X					X	
7	M1		Create a research proposal							X						X	
1	GEO4-GIMA2	Basic Applications	Use basic methods and techniques for geo-data handling		X			X		X							
2	M2		Employ multiple software packages and datasets to solve a GIS project		X			X		X							
3	M2		Explain the influence of data quality on the results of the GIS project		X			X		X							
4	M2		Integrate existing scientific knowledge into a case-study oriented GIS-project		X			X		X							
5	M2		Evaluate own methodology and project results as well as those chosen/produced by colleague students		X		X	X		X						X	
1	GEO4-GIMA3	Management in organisations	Remember key GI-organisations, their differences, their roles and their scale level of application.	X													
2	M3		Remember and understand the principles of management science and management information sciences and apply the organisational resources (Software, Hardware, 'Humanware', 'Dataware' and 'Orgware') to GI-organisations.	X	X	X											
3	M3		Understand the concepts, processes and main components of spatial data infrastructures and their requirements to support data sharing between GI-organisations.	X		X						X					
4	M3		Apply the main methods and tools for organisation (infrastructure) planning, development and management through the application of a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats), and a cost-benefit analysis.	X	X	X	X			X	X						
5	M3		Evaluate the existing management of GI of an organisation.			X	X			X	X						
6	M3		Create and present a business plan for the management of a GI-organisation.	X	X	X		X		X	X	X	X	X	X	X	X
1	GEO4-GIMA4	Geoinfo project management	Describe and understand the structure of organisations	X						X							
2	M4		Understand and use methods & techniques of project management to read and prepare a project proposal Identify and formulate objectives, tasks, resources, deliverables of a project	X	X					X			X				
3	M4		Identify and formulate objectives, tasks, resources, deliverables of a project	X	X	X	X			X				X			
4	M4		Identify and specify the phases in a project, as well as to break down the project in activities and sub-activities			X				X				X			
5	M4		Identify the need for human resources and allocate human resources within a GI project at an operational level (workflow management)			X				X				X			
6	M4		Use appropriate tools to evaluate GI project proposals and results	X	X		X			X						X	
7	M4		Use indicators to measure project performance		X	X	X			X							
1	GEO4-GIMA5	Advanced Methods and techniques	Have an overview of simple and advanced spatial data models and understand which model serves which purpose	X	X	X						X					
2	M5		Be proficient in elementary (query) spatial data operators, in both raster and vector domain	X*	X*	X*						X*					
3	M5		Understand and be able to set up and carry out spatial computations	X*	X*	X*						X*					
4	M5		Understand the principles of spatiotemporal modelling in GIS	X*	X*	X*						X*					
5	M5		Understand, and to some extent apply, the principles of spatial planning support	X*	X*	X*						X*					
6	M5		Understand how geodata can be made public using visualization technology developed for the internet	X*	X*	X*						X*					
7	M5		Have specialized themselves in one of the offered in-depth study topics					X*	X*	(4,6)	X*					X*	
1	GEO4-GIMA6	Advanced applications	Integrate knowledge and skills of the previous modules (1,2,4,5);			X	X			X						X	
2	M6		Apply project management and progress monitoring skills to prepare, plan, execute, manage and monitor a GIS project;		X										X		
3	M6		Independently use appropriate GI techniques and methods in the context of specific applications;		X	X											
4	M6		Present the methodology and results in an appropriate manner for a specific context;		X	X					X						
5	M6		Develop a critical attitude towards data and data processing methods;				X									X	
6	M6		Evaluate organisational restraints and consequences.				X									X	

			Course (module) objectives	GIMA programme learning outcomes													
				1	2	3	4	5	6	7	8	9	10	11	12		
No.	Code	Course	The graduate will / will be able to:	Domain-specific learning outcomes					Scientific learning outcomes			General learning outcomes					
1	GEO4-GIMA7	Internship	Have applied in practice and tested the theoretical and practical knowledge accumulated in modules 1-6. The module contributed to mastering the student's syllabus and improving the student's basis for graduation.		X	X		X		X					X		
2	M7		Have acquired or increased technical experience, insight into business, and social and other skills.	X	X						X						
3	M7		Have been given the opportunity to become familiar with a geo-information workplace.	X	X	X					X						X
1	GEO4-GIMA8	Thesis	Demonstrate her/his ability to use and integrate knowledge and competences acquired in modules 1-6 and preferably the internship for an advanced, master level research, development and/or design project that adheres to international scientific standards and shows originality and scholarship.		X	X	X	X	X		X					X	
2	M8		Demonstrate her/his ability to present the process and the results of the research project in both written and oral format and to defend and judge the value of one's work in conformity with international scientific conventions.								X					X	
3	M8		Demonstrate understanding of the moral and ethic dimensions of scientific research and its applications, and the importance of intellectual integrity while performing and reporting the MSc research.										X			X	

- X Course objective contributes to a GIMA programme learning outcome
- X\* Contribution of the course objective to a GIMA programme learning outcome depends on selected topic

#### GIMA programme learning outcomes (columns 1 to 12):

##### DOMAIN SPECIFIC

1. Identify and understand geo-information concepts, methods and techniques.
2. Use appropriate concepts, methods and techniques for the management and application of geo-information.
3. Analyse the quality and usability of geo-information processes.
4. Evaluate solutions for societal problems by applying knowledge of geo-information.
5. Design and implement proof-of-concept geo-information-based solutions for societal problems.

##### SCIENTIFIC

6. Independently formulate and execute research in accordance with academic standards within the field.
7. Communicate clearly (both orally and in writing) with specialists and non-specialists to present and discuss the outcomes of research and design projects.
8. Show awareness of the need to keep in touch with relevant developments within the discipline and is able to recognise, understand and apply new concepts and approaches as they emerge.
9. Demonstrate understanding of the moral and ethical dimensions of scientific research and its applications, and the importance of intellectual integrity.

##### GENERAL LEARNING OUTCOMES

10. Effectively organize, structure and plan phases in multidisciplinary team work.
11. Critically reflect on own performance and results, as well as on those of colleagues.
12. Design and plan a path to study in Geo-Information Science in a manner that is largely self-directed or autonomous.



**Module 0: Introduction**

<b>Course name</b>	<b>Introduction</b>	
<b>Course code</b>	<b>GEO4-GIMAO</b>	
<b>ECTS credits</b>	0.0	
<b>Level</b>	Master	
<b>Course language</b>	English	
<b>Period / time-slot</b>	Week 36	
<b>Coordinators</b>	Main: Menno-Jan Kraak (UT-ITC)	[t] +31 (0) 53 487 4463 [e] <a href="mailto:m.j.kraak@utwente.nl">m.j.kraak@utwente.nl</a>
	Assistant: Stan Geertman (UU)	[t] +31 (0) 30 253 4527 [e] <a href="mailto:S.C.M.Geertman@uu.nl">S.C.M.Geertman@uu.nl</a>
<b>Lecturers</b>	Menno-Jan Kraak (UT-ITC) Arnold Bregt (WUR) Stan Geertman (UU) Peter van Oosterom (TUD) Corné van Elzakker (UT-ITC)	[e] <a href="mailto:m.j.kraak@utwente.nl">m.j.kraak@utwente.nl</a> [e] <a href="mailto:Arnold.Bregt@wur.nl">Arnold.Bregt@wur.nl</a> [e] <a href="mailto:S.C.M.Geertman@uu.nl">S.C.M.Geertman@uu.nl</a> [e] <a href="mailto:p.j.m.vanOosterom@tudelft.nl">p.j.m.vanOosterom@tudelft.nl</a> [e] <a href="mailto:c.vanelzakker@utwente.nl">c.vanelzakker@utwente.nl</a>
<b>Entry requirements</b>	Letter of acceptance of the master programme Geographical Information Management and Applications	
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Exercises</li> </ul>	
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Perspectives on geo-information and geo-informatics</li> <li>- Need for geo-information</li> <li>- Study program introduction and facilities</li> </ul>	
<b>Profile</b>	The course is meant as introduction to the six content modules.	
<b>Contents</b>	<ul style="list-style-type: none"> <li>- During several lectures, the basics of geo-information and geo-informatics as seen from the perspectives of the four participating universities are conveyed.</li> <li>- Exercise on needs assessment for geo-information: case study - Enschede Fireworks Disaster</li> <li>- Hands-on experience with Blackboard and GIS.</li> </ul>	
<b>Course objectives</b>	<i>The participant will:</i> <ul style="list-style-type: none"> <li>- Gain understanding of the nature of the GIMA course.</li> <li>- Understand that different approaches towards geo-informatics are possible.</li> <li>- Understand why geo-information is needed to solve problems.</li> <li>- Obtain practical knowledge on how to use learning and communication tools of the GIMA distance-learning mode.</li> <li>- Improve GIS skills.</li> </ul>	
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Manuals and guides</li> <li>- Powerpoint presentations</li> <li>- Blackboard</li> <li>- Adobe Connect</li> </ul>	



	- ESRI campus courses
<b>Examination</b>	Presentation of case study results (0%)
<b>Schedule</b>	<p>Tuesday (week 36): Lectures, exercises</p> <p>Wednesday (week 36): Lectures, exercises, intake interviews</p> <p>Thursday (week 36): Lectures, presentations, excursion</p>

## Module 1: Basic Methods and Techniques

<b>Course name</b>	<b>Basic methods and techniques</b>
<b>Course code</b>	<b>GEO4-GIMA1</b>
<b>ECTS credits</b>	10.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period / time-slot</b>	Week 36-50
<b>Coordinators</b>	Main: [t] +31 (0) 53 487 4414 Ellen-Wien Augustijn (UT-ITC) [e] <a href="mailto:p.w.m.augustijn@utwente.nl">p.w.m.augustijn@utwente.nl</a>  Assistant: [t] +31 (0) 317-481802 Jan Clevers (WUR) [e] <a href="mailto:jan.clevers@wur.nl">jan.clevers@wur.nl</a>
<b>Lecturers</b>	Ellen-Wien Augustijn (UT-ITC) [e] <a href="mailto:p.w.m.augustijn@utwente.nl">p.w.m.augustijn@utwente.nl</a> Corné van Elzakker (UT-ITC) [e] <a href="mailto:c.vanelzakker@utwente.nl">c.vanelzakker@utwente.nl</a> Jan Clevers (WUR) [e] <a href="mailto:jan.clevers@wur.nl">jan.clevers@wur.nl</a> Richard Knippers (UT-ITC) [e] <a href="mailto:r.knippers@utwente.nl">r.knippers@utwente.nl</a>
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the MSc Geographical Science programme Geographical Information Management and Applications</li> <li>- Understanding of Geo-Information Science terminology as presented for example in Principles of Geographic Information Systems (ITC)</li> <li>- Preferably also basic level of GIS skills</li> <li>- Basic academic skills</li> </ul>
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Practical exercises</li> <li>- Distance learning</li> <li>- Data analysis and visualization</li> <li>- Reading assignments</li> <li>- Technical documentation</li> <li>- Proposal writing</li> <li>- Individual written assignments</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Academic research &amp; writing</li> <li>- Introduction to remote sensing</li> <li>- Introduction to data modelling</li> <li>- Introduction to analytical modelling &amp; spatial analysis</li> <li>- Introduction to spatial referencing &amp; positioning</li> <li>- Introduction to cartography &amp; visualization</li> </ul>
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The course is meant as introduction of in-depth contents of geo-information and serves as the basic methods and techniques for all other modules.</li> <li>- Module 5 will enhance the knowledge with respect to database technology and data analysis.</li> </ul>
<b>Contents</b>	This module focuses on the technological aspects of geo-information management. The geo-information process can be split up into four main aspects: (1) data acquisition including Remote Sensing, (2) data storage, (3) data manipulation and analysis, and

	(4) visualization.  The aim of the module is to provide a major introduction to these aspects. After completion of this module, students have basic knowledge about data acquisition methods and tools. Besides the technological content, time is allocated to build scientific research skills. Main focus during this module is on translation of a problem definition into a research proposal.														
<b>Course objectives</b>	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Describe and understand the basics of the geo-information process, including the role of data modelling</li> <li>- Understand the principles of data acquisition (including an introduction in Remote Sensing), data storage, data analysis, and visualization technologies</li> <li>- Understand the basics of quality issues of geo-information</li> <li>- Apply basic methods in handling geo-information using the ArcGIS software</li> <li>- Apply basic skills in searching and validating scientific literature</li> <li>- Analyse basic problems, decide on solutions and summarize findings in a technical report</li> <li>- Create a research proposal</li> </ul>														
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Parts of the textbooks, announced in the description of this course module (<i>books might change in time, consult module coordinator or secretary</i>):           <ul style="list-style-type: none"> <li>o Kraak, M.J. &amp; F.J. Ormeling (2009), Cartography, Visualization of Spatial Data, 3<sup>rd</sup> edition. Harlow: Pearson</li> <li>o Heywood, D.I., S.C. Cornelius and S.J. Carver (2011), An Introduction to Geographical Information Systems, 4th edition. Harlow: Pearson Education</li> <li>o De Smith, M.J., M.F. Goodchild and P.A. Longley (2009), Geospatial Analysis, A comprehensive Guide to Principles, Techniques and Software Tools, 3rd edition. Leiceister: Matador. Available as printed book, but also free of charge as a web version or pdf: <a href="http://www.spatialanalysisonline.com">www.spatialanalysisonline.com</a></li> </ul> </li> <li>- ArcGIS</li> <li>- Blackboard</li> <li>- Specialized websites</li> </ul>														
<b>Examination</b>	Active participation Eight graded Individual written assignments (50%) Written closed book examination (50%)														
<b>Exemption</b>	Not possible														
<b>Schedule</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Friday (week 36):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Monday (week 37):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Thursday (week 37):</td> <td>Lectures, exercises, field work</td> </tr> <tr> <td colspan="2"><i>Distant learning:</i></td> </tr> <tr> <td></td> <td><i>On-going feedback and monitoring</i></td> </tr> <tr> <td>Monday (week 50):</td> <td>Feedback lectures</td> </tr> <tr> <td>Tuesday (week 50):</td> <td>Computer examination, evaluation</td> </tr> </table>	Friday (week 36):	Lectures, exercises	Monday (week 37):	Lectures, exercises	Thursday (week 37):	Lectures, exercises, field work	<i>Distant learning:</i>			<i>On-going feedback and monitoring</i>	Monday (week 50):	Feedback lectures	Tuesday (week 50):	Computer examination, evaluation
Friday (week 36):	Lectures, exercises														
Monday (week 37):	Lectures, exercises														
Thursday (week 37):	Lectures, exercises, field work														
<i>Distant learning:</i>															
	<i>On-going feedback and monitoring</i>														
Monday (week 50):	Feedback lectures														
Tuesday (week 50):	Computer examination, evaluation														
<b>Degree of freedom</b>	<i>No free choice of contents within this module</i>														



## Module 2: Basic Applications

<b>Course name</b>	<b>Basic applications</b>
<b>Course code</b>	<b>GEO4-GIMA2</b>
<b>ECTS credits</b>	10.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period / time-slot</b>	Week 50-13
<b>Coordinators</b>	<p>Main: [t] +31 (0) 30 253 4527  Stan Geertman (UU) [e] <a href="mailto:S.C.M.Geertman@uu.nl">S.C.M.Geertman@uu.nl</a></p> <p>Assistant: [t] +31 (0) 317 48 1865  Willy ten Haaf (WUR) [e] <a href="mailto:willy.tenhaaf@wur.nl">willy.tenhaaf@wur.nl</a></p>
<b>Lecturers</b>	<p>Stan Geertman (UU) [e] <a href="mailto:S.C.M.Geertman@uu.nl">S.C.M.Geertman@uu.nl</a>  Willy ten Haaf (WUR) [e] <a href="mailto:willy.tenhaaf@wur.nl">willy.tenhaaf@wur.nl</a>  Raul Zurita-Milla (UT) [e] <a href="mailto:r.zurita-milla@utwente.nl">r.zurita-milla@utwente.nl</a></p>
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the master programme Geographical Information Management and Applications</li> <li>- Passed (or actively participated in, and about to pass) Module 1 (GEO4-GIMA1)</li> </ul>
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Excursion</li> <li>- Supervisors discussions</li> <li>- Distance learning</li> <li>- Writing project plan</li> <li>- Literature research</li> <li>- Preparing &amp; analyzing data</li> <li>- Visualization of results</li> <li>- Writing group report</li> <li>- Presentation</li> <li>- Evaluation</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Basic GI analysis in the form of a project</li> <li>- Peer review processing</li> <li>- Introduction to spatial data quality issues</li> <li>- Introduction to geo-data handling issues</li> <li>- Introduction to searching for and dealing with scientific literature</li> <li>- Introduction to writing a scientific report</li> <li>- Application of analytical modelling &amp; spatial analysis</li> <li>- Application of cartography &amp; visualization of project results</li> </ul>
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The course is meant to use the acquired knowledge of module 1 (GEO4-GIMA1), by carrying out a project in an academic fashion.</li> <li>- The course serves as an introduction to the later Module 6, where similar up-scale and enhanced projects have to be performed.</li> </ul>
<b>Contents</b>	<p>During the first days the participants will be introduced to different types of projects and the data sets needed in them. Issues like data quality, project planning and data handling will be dealt with, as well as methodological reflexion. Thereafter the students</p>

	<p>will work group wise on a project. Therein the participants are not only asked to work on their own project but they will also be involved in monitoring and evaluating the progress and results of a counter group.</p> <p><b>Students can select one from four cases (preliminary list):</b></p> <ul style="list-style-type: none"> <li>- Case 1 (green) Vineyards in Wageningen</li> <li>- Case 2 (red) Sustainable Urbanisation</li> <li>- Case 3 (grey) Enschede school planning</li> </ul>														
	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Use basic methods and techniques for geo-data handling</li> <li>- Employ multiple software packages and datasets to solve a GIS project</li> <li>- Explain the influence of data quality on the results of the GIS project</li> <li>- Investigate existing scientific knowledge applicable to the GIS project</li> <li>- Evaluate own methodology and project results as well as those chosen/produced by colleague students</li> </ul> <p><i>Final attainment level:</i>          At the end of module 2 participants are able to prepare, plan and execute basic GIS application projects in a scientific manner and demonstrate the results of their projects in oral and written form with a critical awareness of relevant data quality aspects.</p>														
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Literature is dependent on the selected case to serve as academic theory</li> <li>- ArcGIS or any other GI-software</li> <li>- Blackboard</li> <li>- Powerpoint or any other presentation software</li> </ul>														
<b>Examination</b>	<ul style="list-style-type: none"> <li>- Final project proposal (10%)</li> <li>- Final project report (60%)</li> <li>- Final project presentation (15%)</li> <li>- Peer reviews by counter group (15%)</li> </ul> <p><i>Percentages subject to amendments.</i></p>														
<b>Exemption</b>	<p>Possible in exceptional cases, if proof exists he/she did similar, scientific-oriented GI-application courses with the same ECTS value before at the same level.</p>														
<b>Schedule</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Friday (week 50):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Monday (week 51):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Tuesday (week 51):</td> <td>Lectures, exercises, excursion</td> </tr> <tr> <td colspan="2"><i>Distant learning:</i></td> </tr> <tr> <td></td> <td><i>On-going supervision</i></td> </tr> <tr> <td>Monday (week 13):</td> <td>Presentations</td> </tr> <tr> <td>Tuesday (week 13):</td> <td>Presentations, evaluation</td> </tr> </table>	Friday (week 50):	Lectures, exercises	Monday (week 51):	Lectures, exercises	Tuesday (week 51):	Lectures, exercises, excursion	<i>Distant learning:</i>			<i>On-going supervision</i>	Monday (week 13):	Presentations	Tuesday (week 13):	Presentations, evaluation
Friday (week 50):	Lectures, exercises														
Monday (week 51):	Lectures, exercises														
Tuesday (week 51):	Lectures, exercises, excursion														
<i>Distant learning:</i>															
	<i>On-going supervision</i>														
Monday (week 13):	Presentations														
Tuesday (week 13):	Presentations, evaluation														
<b>Degree of freedom</b>	<p><i>Free choice of project type (value of approx. 9.5 ECTS)</i></p>														

### Module 3: Management in Organizations

<b>Course name</b>	<b>Management in Organizations</b>
<b>Course code</b>	<b>GEO4-GIMA3</b>
<b>ECTS credits</b>	10.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period/time-slot</b>	Week 13-27
<b>Coordinators</b>	<p>Main: [t] +31 (0) 15 278 2554          Bastiaan van Loenen (TUD) [e] <a href="mailto:b.vanloenen@tudelft.nl">b.vanloenen@tudelft.nl</a></p> <p>Assistant: [t] +31 (0) 317 48 1697          Łukasz Grus [e] <a href="mailto:lucas.grus@wur.nl">lucas.grus@wur.nl</a>          Frederika Welle Donker (TUD) [e] <a href="mailto:f.m.welledonker@tudelft.nl">f.m.welledonker@tudelft.nl</a></p>
<b>Lecturers</b>	<p>Bastiaan van Loenen (TUD) [e] <a href="mailto:b.vanloenen@tudelft.nl">b.vanloenen@tudelft.nl</a>          Łukasz Grus (WUR) [e] <a href="mailto:lucas.grus@wur.nl">lucas.grus@wur.nl</a>          Frederika Welle Donker (TUD) [e] <a href="mailto:f.m.welledonker@tudelft.nl">f.m.welledonker@tudelft.nl</a>          Arnold Bregt (WUR) [e] <a href="mailto:arnold.bregt@wur.nl">arnold.bregt@wur.nl</a>          Walter de Vries (UT-ITC) [e] <a href="mailto:w.t.devries@utwente.nl">w.t.devries@utwente.nl</a></p>
<b>Entry requirements</b>	Letter of acceptance of the master programme Geographical Information Management and Applications
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Distance learning</li> <li>- Writing of business plan</li> <li>- Literature research</li> <li>- Supervisor discussions</li> <li>- Distance presentations</li> <li>- Presentation</li> <li>- Evaluation</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- GI as department in organizations</li> <li>- Managerial aspects of GI</li> <li>- Spatial Data Infrastructures (SDI)</li> <li>- Policies, legal and jurisdictional issues</li> </ul>
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The course tries to raise the awareness of how geo-information should be organised and promoted in the real world. It emphasizes on <i>why</i> geo-information should be used and <i>how</i> that is possible.</li> <li>- The course relates to Module 4 (GEO4-GIMA4), although in this case geo-information is embedded in an organization; it is business driven rather than project driven.</li> <li>- The course comes with many deadlines and thus simulates real world business.</li> </ul>
<b>Contents</b>	The main objective is to be able to write for a specific GI-organization a management strategy (business) plan that focuses mainly on the incorporation of SDI-facilities to improve the data sharing between organizations, based on internal resources and external conditions using business methods and tools for organization (infrastructure)

	<p>planning, development and management.</p> <p>The module deals with several types of GI-organizations, which differ in role (governmental vs. industrial; GI-Producer vs. GI-User oriented) and scale (Global, Regional, National, State, Local and Corporate). When planning, developing and managing a suitable environment for a specific GI-organization, GI-managers should focus on several organization-internal resources (hardware, software, humanware, dataware and orgware) and on several external conditions like legal, cultural, technological, economic and institutional aspects. Special emphasis is put on spatial data infrastructures, which intention is to improve and to support the management of dataware. To support the decisions made, several business methods and tools exist for organization planning, development and management. Application of these knowledge and methods/tools in a management strategy (business) plan is core business of this module, so that GI-managers are able to make efficient use of available (desired) resources.</p> <p>The course is split in five parts:</p> <ol style="list-style-type: none"> <li>1. Concepts of GI-organizations (week 13 - 16)</li> <li>2. GI-Organization development and management aspects (week 17 – 18)</li> <li>3. SDI-concepts/Nature and hierarchy (week 19 – 20)</li> <li>4. SDI-Components (technical components) (week 21 – 22)</li> <li>5. Application (Creation) of SDI-GI-Organization integration (week 23 – 25)</li> </ol>
<b>Course objectives</b>	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Remember key GI-organizations, their differences, their roles and their scale level of application.</li> <li>- Remember and understand the principles of management science and management information sciences and apply the organizational resources (Software, Hardware, 'Humanware', 'Dataware' and 'Orgware') to GI-organizations.</li> <li>- Understand the concepts, processes and main components of spatial data infrastructures and their requirements to support data sharing between GI-organizations.</li> <li>- Apply the main methods and tools for organization (infrastructure) planning, development and management through the application of a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats), and a cost-benefit analysis.</li> <li>- Evaluate the existing management of GI of an organization.</li> <li>- Create and present a business plan for the management of a GI-organization.</li> </ul>
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Parts of the textbooks, announced in the description of this course module, which includes (<i>books might change</i>):</li> <li>-</li> <li>o Reeve, D. &amp; J. Petch (1999), GIS Organisations and People, A socio-technical Approach. GIS for beginners. London: Taylor &amp; Francis.</li> <li>o Further to be announced in the description of this course module</li> <li>- Lecture notes</li> <li>- Blackboard</li> <li>- Distance presentation software</li> <li>- Powerpoint or any other presentation software</li> </ul>
<b>Examination</b>	<ul style="list-style-type: none"> <li>- Individual (sub) case presentations (10%),</li> <li>- Individual exercises (10%), (written, open book)</li> <li>- Individual (business) plan assessment (10%) (written, business plan can be accessed)</li> <li>- Group's statement explanations (10%) (written, open book)</li> <li>- Group's management strategy (business) plan (30%),</li> <li>- Individual exam (30%) (written, closed book)</li> </ul>

	<i>Percentages subject to amendments.</i>	
<b>Exemption</b>	Not possible	
<b>Schedule</b>	Friday (week 13): Monday (week 14): Tuesday (week 14):  <i>Distant learning:</i>  Monday (week 27): Tuesday (week 27):	Lectures, exercises Lectures, exercises Lectures, presentations  <i>On-going supervision</i>  Presentations Examination, presentations, evaluations
<b>Degree of freedom</b>	<i>Free choice of company set-up (approx. 3.0 ECTS)</i>	



## Module 4: Project Management

<b>Course name</b>	<b>Project Management</b>
<b>Course code</b>	<b>GEO4-GIMA4</b>
<b>ECTS credits</b>	10.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period/time-slot</b>	Week 37-50
<b>Coordinators</b>	<p>Main: [t] +31 (0) 30 253 3877 Fred Toppen (UU) [e] <a href="mailto:f.j.toppen@uu.nl">f.j.toppen@uu.nl</a></p> <p>Assistant: [t] +31 (0) 53 487 4377 Bert Raidt (UT-ITC) [e] <a href="mailto:bert.raidt@utwente.nl">bert.raidt@utwente.nl</a></p>
<b>Lecturers</b>	<p>Fred Toppen (UU) [e] <a href="mailto:f.j.toppen@uu.nl">f.j.toppen@uu.nl</a></p> <p>Bert Raidt (UT-ITC) [e] <a href="mailto:bert.raidt@utwente.nl">bert.raidt@utwente.nl</a></p> <p>Stan Geertman (UU) [e] <a href="mailto:s.geertman@uu.nl">s.geertman@uu.nl</a></p> <p>Marien de Bakker (RUG) [e] <a href="mailto:m.debakker@rug.nl">m.debakker@rug.nl</a></p>
<b>Entry requirements</b>	Letter of acceptance of the master programme Geographical Information Management and Applications
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Distance learning</li> <li>- Writing of project plan</li> <li>- Academic reviewing</li> <li>- Literature research</li> <li>- Individual assignments</li> <li>- Case study</li> <li>- Supervisor discussions</li> <li>- Presentation</li> <li>- Evaluation</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- (GI) projects</li> <li>- General project management</li> <li>- Time management</li> <li>- Risk management</li> <li>- Human management</li> <li>- Evaluation</li> <li>- Academic skills and writing</li> </ul>
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The course emphasizes on (GI) projects management. However, not the geo-information itself is being assessed, but rather the organizational set-up in project-like environments.</li> <li>- The course relates to Module 3 (GEO4-GIMA3), although in this case geo-information is project based, and not embedded in an organization.</li> <li>- The course assesses the academic approach of project management.</li> </ul>
<b>Contents</b>	<p>The course is split in the following parts.</p> <ul style="list-style-type: none"> <li>- Introduction to organizations, project management approaches, project management life cycle</li> <li>- Getting acquainted to project management related tools and issues in the</li> </ul>

	<p>project set up phase: definition of scope / objectives / resources / deliverables / activities / tasks</p> <ul style="list-style-type: none"> <li>- Getting acquainted to project management related methods &amp; techniques (e.g. Gant, PERT)</li> <li>- Applying knowledge and skills on project management for the purpose of the operational phase: human resource issues, workflow management issues, risk management</li> <li>- Evaluating GI projects: project performance issues, reviewing project proposals, project presentation issues</li> </ul>														
<b>Course objectives</b>	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Describe and understand the structure of organizations</li> <li>- Acquire knowledge on methods &amp; techniques of project management, in order to be able both to prepare and read a project proposal</li> <li>- Identify and formulate objectives, tasks, resources, deliverables of a project</li> <li>- Identify and specify the phases in a project, as well as to break down the project in activities and sub-activities</li> <li>- Identify the need for human resources and allocate human resources within a GI project at an operational level (workflow management)</li> <li>- Use appropriate tools to evaluate GI project proposals and results</li> <li>- Use indicators to measure project performance</li> </ul>														
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Parts of the textbooks, announced in the description of this course module, which includes: <ul style="list-style-type: none"> <li>o Mantel, Samuel J., Jack R. Meredith, Scott M. Shafer and Margaret M. Sutton (2011) Project management Practice ISBN 978-0-470-64620-5 paperback ((International Student Version).) 4th edition.</li> <li>o Further to be announced in the description of this course module.</li> </ul> </li> <li>- Lecture notes</li> <li>- MS Office Project</li> <li>- Blackboard</li> <li>- Powerpoint or any other presentation software</li> </ul>														
<b>Examination</b>	<ul style="list-style-type: none"> <li>- Written Examination (closed book) covering the lectures and literature list(25 %)</li> <li>- Individual assignment literature paper (25 %)</li> <li>- Project proposal, including all the elements that should be part of such a proposal, such as scope, deliverables / activities / tasks, resources (time, human), budget, risk . Also: an individual literature based task on a p.m. aspect related to the project and a group based process report and project presentation. (together: 50 %)</li> </ul> <p><i>Percentages subject to amendments.</i></p>														
<b>Exemption</b>	Only possible for the project contents, if one can prove his/her experience.														
<b>Schedule</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Wednesday (week 37):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Thursday (week 37):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Friday (week 37):</td> <td>Lectures</td> </tr> <tr> <td colspan="2"><i>Distant learning:</i></td> </tr> <tr> <td></td> <td><i>On-going supervision</i></td> </tr> <tr> <td>Wednesday (week 50):</td> <td>Examination, preparations, discussions, presentations</td> </tr> <tr> <td>Thursday (week 50):</td> <td>Presentations, evaluation</td> </tr> </table>	Wednesday (week 37):	Lectures, exercises	Thursday (week 37):	Lectures, exercises	Friday (week 37):	Lectures	<i>Distant learning:</i>			<i>On-going supervision</i>	Wednesday (week 50):	Examination, preparations, discussions, presentations	Thursday (week 50):	Presentations, evaluation
Wednesday (week 37):	Lectures, exercises														
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<i>Distant learning:</i>															
	<i>On-going supervision</i>														
Wednesday (week 50):	Examination, preparations, discussions, presentations														
Thursday (week 50):	Presentations, evaluation														
<b>Degree of freedom</b>	<i>Free choice of project company set-up (approx. 3.5 ECTS)</i>														



## Module 5: Advanced Methods and Techniques

<b>Course name</b>	<b>Advanced methods and techniques</b>
<b>Course code</b>	<b>GEO4-GIMA5</b>
<b>ECTS credits</b>	10.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period/time-slot</b>	Week 51-13
<b>Coordinators</b>	Main: [t] +31 (0) 53 487 4529 Rob Lemmens (UT-ITC) [e] <a href="mailto:r.l.g.lemmens@utwente.nl">r.l.g.lemmens@utwente.nl</a>  Assistant: [t] +31 (0) 30 253 2768 Derek Karssenber (UU) [e] <a href="mailto:d.karssenberg@uu.nl">d.karssenberg@uu.nl</a>
<b>Lecturers</b>	Rob Lemmens (UT-ITC) [e] <a href="mailto:r.l.g.lemmens@utwente.nl">r.l.g.lemmens@utwente.nl</a> Javier Morales (UT-ITC) [e] <a href="mailto:j.morales@utwente.nl">j.morales@utwente.nl</a> Derek Karssenber (UU) [e] <a href="mailto:karssenberg@uu.nl">karssenberg@uu.nl</a> Barend Kobbén (UT-ITC) [e] <a href="mailto:b.j.kobben@utwente.nl">b.j.kobben@utwente.nl</a> Peter van Oosterom (TUD) [e] <a href="mailto:p.i.m.vanoosterom@tudelft.nl">p.i.m.vanoosterom@tudelft.nl</a> Sisi Zlatanova (TUD) [e] <a href="mailto:s.zlatanova@tudelft.nl">s.zlatanova@tudelft.nl</a> Tom de Jong (UU) [e] <a href="mailto:t.dejong@uu.nl">t.dejong@uu.nl</a>
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the master programme Geographical Information Management and Applications</li> <li>- Passed (or actively participated in, and about to pass) Module 1 (GEO4-GIMA1)</li> <li>- Passed (or actively participated in, and about to pass) Module 2 (GEO4-GIMA2)</li> </ul>
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Distance learning</li> <li>- Academic reviewing</li> <li>- Literature study</li> <li>- Individual assignments</li> <li>- Case study (in-depth analysis)</li> <li>- Reporting</li> <li>- Presentation</li> <li>- Evaluation</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Geodatabases and SQL</li> <li>- Spatiotemporal modelling</li> <li>- Spatial network analysis</li> <li>- 3D</li> <li>- Geostatistics computer programming</li> <li>- Web-based dissemination</li> </ul>
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The course continues on where Module 1 (GEO4-GIMA1) left off.</li> <li>- The course addresses more than Module 1 (GEO4-GIMA1) on the processes behind GI.</li> <li>- The course will be followed by the application of the contents in Module 6 (GEO4-GIMA6).</li> </ul>

<b>Contents</b>	<p>Two phases: a breadth-first phase, and an in-depth phase.</p> <p>The breadth-first phase covers in principle five components:</p> <ul style="list-style-type: none"> <li>- Simple and advanced geodata models</li> <li>- Geodatabases and their design and use</li> <li>- Spatio-temporal modelling</li> <li>- Geostatistical models</li> <li>- Python programming</li> <li>- Spatial Network Analysis</li> <li>- Web-based dissemination of geo-information</li> </ul> <p>The in-depth phase will build on one of the breadth-first topics.</p>										
<b>Course objectives</b>	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Describe and understand the structure of organizations</li> <li>- Acquire knowledge on methods &amp; techniques of project management, in order to be able both to prepare and read a project proposal</li> <li>- Identify and formulate objectives, tasks, resources, deliverables of a project</li> <li>- Identify and specify the phases in a project, as well as to break down the project in activities and sub-activities</li> <li>- Identify the need for human resources and allocate human resources within a (GI) project at an operational level (workflow management)</li> <li>- Use appropriate tools to evaluate (GI) project proposals and results</li> <li>- Use indicators to measure project performance</li> </ul>										
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- Reader with background information for breadth-first topics</li> <li>- Software tools comprising ArcGIS, UML editor, PostGIS, PCRaster, MapServer, OpenLayers, Flowmap, and Blackboard</li> <li>- Powerpoint or any other presentation software</li> </ul>										
<b>Examination</b>	<ul style="list-style-type: none"> <li>- Breadth-first topics (written exam (closed book) and exercises)(50%)</li> <li>- In-depth topic (written report and presentation) (50%)</li> </ul> <p><i>Percentages subject to amendments.</i></p>										
<b>Exemption</b>	Not possible										
<b>Schedule</b>	<table border="0"> <tr> <td>Wednesday (week 51):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Thursday (week 51):</td> <td>Lectures, exercises</td> </tr> <tr> <td>Friday (week 51):</td> <td>Lectures</td> </tr> <tr> <td><i>Distant learning:</i></td> <td><i>On-going supervision</i></td> </tr> <tr> <td>Wednesday and Thursday (week 13):</td> <td>Examination, preparations, discussions, presentations, evaluation</td> </tr> </table>	Wednesday (week 51):	Lectures, exercises	Thursday (week 51):	Lectures, exercises	Friday (week 51):	Lectures	<i>Distant learning:</i>	<i>On-going supervision</i>	Wednesday and Thursday (week 13):	Examination, preparations, discussions, presentations, evaluation
Wednesday (week 51):	Lectures, exercises										
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<i>Distant learning:</i>	<i>On-going supervision</i>										
Wednesday and Thursday (week 13):	Examination, preparations, discussions, presentations, evaluation										
<b>Degree of freedom</b>	<i>Free choice of in-depth topic (approx. 3.0 ECTS)</i>										

## Module 6: Advanced Applications

<b>Course name</b>	<b>Advanced Applications</b>	
<b>Course code</b>	<b>GEO4-GIMA6</b>	
<b>ECTS credits</b>	10.0	
<b>Level</b>	Master	
<b>Course language</b>	English	
<b>Period/time-slot</b>	Week 14-27	
<b>Coordinators</b>	Main: Arend Ligtenberg (WUR)	[t] +31 (0) 317 481845 [e] <a href="mailto:arend.ligtenberg@wur.nl">arend.ligtenberg@wur.nl</a>
	Assistant: Marian de Vries	[t] +31 (0) 15 2784268 [e] <a href="mailto:m.devries@tudelft.nl">m.devries@tudelft.nl</a>
<b>Lecturers</b>	Arend Ligtenberg (WUR) Marian de Vries (TUD) Rob Lemmens (UT-ITC) Derek Karssenber (UU) Maarten Zeylmans van Emmichoven (UU) John Stuiwer (WUR) Sytze de Bruin (WUR)	[e] <a href="mailto:arend.ligtenberg@wur.nl">arend.ligtenberg@wur.nl</a> [e] <a href="mailto:m.devries@tudelft.nl">m.devries@tudelft.nl</a> [e] <a href="mailto:r.l.g.lemmens@utwente.nl">r.l.g.lemmens@utwente.nl</a> [e] <a href="mailto:d.karssenber@uu.nl">d.karssenber@uu.nl</a> [e] <a href="mailto:m.i.zeylmansvanemmichoven@uu.nl">m.i.zeylmansvanemmichoven@uu.nl</a> [e] <a href="mailto:john.stuiver@wur.nl">john.stuiver@wur.nl</a> [e] <a href="mailto:sytze.debruin@wur.nl">sytze.debruin@wur.nl</a>
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the master programme Geographical Information Management and Applications</li> <li>- Passed Module 1 (GEO4-GIMA1)</li> <li>- Passed (or actively participated in, and about to pass) Module 2 (GEO4-GIMA2)</li> <li>- Passed (or actively participated in, and about to pass) Module 5 (GEO4-GIMA5)</li> </ul>	
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Lectures</li> <li>- Supervisor discussions</li> <li>- Distance learning</li> <li>- Reviewing</li> <li>- Literature research</li> <li>- Project Plan</li> <li>- Reporting</li> <li>- Presentation</li> <li>- Evaluation</li> </ul>	
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Dissemination</li> <li>- Data alignment</li> <li>- Modelling</li> <li>- Data analysis</li> <li>- Visualization</li> </ul>	
<b>Profile</b>	<ul style="list-style-type: none"> <li>- The module synthesises all other content modules 1-5.</li> <li>- The module is a follow up of Module 2 (GEO4-GIMA2) regarding the applications.</li> <li>- The module is a follow up of Module 5 (GEO4-GIMA5) regarding the contents.</li> <li>- The module provides an impression of the remaining part of the GIMA course</li> </ul>	

<b>Contents</b>	<p>During the first two days the participants have lectures about the course set-up, project and organizational management, research methods and case specific information. Examples of projects are given and discussed and a start is made with setting up the project.</p> <p>Depending on the topic chosen in module 5, students choose from different cases, which include:</p> <ul style="list-style-type: none"> <li>- Generalization and aggregation of spatial information (TUD)</li> <li>- Analyzing geo-data produced by the crowd (ITC)</li> <li>- Spatial temporal land use modelling (WUR)</li> <li>- Generation DEM from stereophotos (UU)</li> </ul> <p>Together with one or two other students, the student works on the case he/she picked. The group work includes: writing a project plan, preparing data, data analysis, visualizing results and writing a scientific report and an executive summary. In the last week of the module the students will present their case. The participants are not only asked to work on their own project, but they are also involved in monitoring and evaluating the progress and results of a counter group.</p>																		
<b>Course objectives</b>	<p><i>After successful completion, the student will be able to:</i></p> <ul style="list-style-type: none"> <li>- Integrate knowledge and skills of the previous modules (1,2,4,5);</li> <li>- Apply project management and progress monitoring skills to prepare, plan, execute, manage and monitor a GIS project;</li> <li>- Independently use appropriate GI techniques and methods in the context of specific applications;</li> <li>- Present the methodology and results in an appropriate manner for a specific context;</li> <li>- Develop a critical attitude towards data and data processing methods;</li> <li>- Evaluate organizational restraints and consequences.</li> </ul>																		
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- <i>Literature is dependent on the selected case to serve as academic theory</i></li> <li>- ArcGIS or any other GI-software</li> <li>- Blackboard</li> <li>- Powerpoint or any other presentation software</li> </ul>																		
<b>Examination</b>	<ul style="list-style-type: none"> <li>- Mid-term report (20%)</li> <li>- Final project results (presentation, report, poster) (65%)</li> <li>- Counter group evaluations (15%)</li> </ul> <p><i>Percentages subject to amendments.</i></p>																		
<b>Exemption</b>	Not possible																		
<b>Schedule</b>	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Wednesday (week 14):</td> <td>Lectures</td> </tr> <tr> <td>Thursday (week 14):</td> <td>Lectures</td> </tr> <tr> <td>Friday (week 14):</td> <td>Discussion with supervisor</td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td><i>Distant learning:</i></td> <td><i>On-going supervision</i></td> </tr> <tr> <td colspan="2"> </td> </tr> <tr> <td>Wednesday (week 27):</td> <td>Presentations, visit to mid-terms and defences,</td> </tr> <tr> <td>Thursday (week 27):</td> <td>Poster sessions</td> </tr> <tr> <td></td> <td>Presentations, poster sessions, evaluation</td> </tr> </table>	Wednesday (week 14):	Lectures	Thursday (week 14):	Lectures	Friday (week 14):	Discussion with supervisor	 		<i>Distant learning:</i>	<i>On-going supervision</i>	 		Wednesday (week 27):	Presentations, visit to mid-terms and defences,	Thursday (week 27):	Poster sessions		Presentations, poster sessions, evaluation
Wednesday (week 14):	Lectures																		
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Wednesday (week 27):	Presentations, visit to mid-terms and defences,																		
Thursday (week 27):	Poster sessions																		
	Presentations, poster sessions, evaluation																		
<b>Degree of freedom</b>	<i>Free choice of project and contents of project (approx. 7.0 ECTS)</i>																		

**Module 7: Internship**

<b>Course name</b>	<b>Internship</b>
<b>Course code</b>	<b>GEO4-GIMA7</b>
<b>ECTS credits</b>	30.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period/time-slot</b>	All time (six months full-time or twelve months part-time)
<b>Coordinators</b>	Main: [t] +31 (0) 317 48 1628 John Stuiver (WUR) [e] <a href="mailto:john.stuiver@wur.nl">john.stuiver@wur.nl</a>  Assistant: [t] +31 (0) 15-2781383 Frederika Welle Donker (TUD) [e] <a href="mailto:f.m.welledonker@tudelft.nl">f.m.welledonker@tudelft.nl</a>
<b>Lecturers</b>	All GIMA staff
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the master programme Geographical Information Management and Applications</li> <li>- Passed at least five out of the six content modules (GEO4-GIMA1 – GEO4-GIMA6). In the case that five modules are completed and one uncompleted, the uncompleted module must be near finalization.</li> </ul>
<b>Activities / Education</b>	<ul style="list-style-type: none"> <li>- Internship or (optional individual programme) internship and additional university course</li> <li>- Internship report or article</li> <li>- Personal reflection report</li> <li>- <i>Optional</i>: activities related to the selected university course</li> </ul>
<b>Themes</b>	<ul style="list-style-type: none"> <li>- Gaining work experience.</li> <li>- <i>Optional</i>: additional relevant university course</li> </ul>
<b>Profile</b>	This module serves as a module where the student has to gain work experience and apply all the knowledge obtained in previous modules in the real world.
<b>Contents</b>	<p>The internship allows the student to gain practical experience in a (geo-information) working environment. The internship contributes to the successful fulfillment of the needed knowledge and experience of an academic and professional GIMA graduate. It allows the student to expand his/her professional experience and creates a sound basis for graduation. The internship is carried out within geo-information companies, agencies and research institutes in the Netherlands or abroad.</p> <p>There are three internship options:</p> <ol style="list-style-type: none"> <li>1. The first option is that the internship (30 credits) is completely carried out in one company, institute or external university (other than the four universities involved in GIMA: Delft, Utrecht, Wageningen and Twente).</li> <li>2. The second option is that the internship is carried out in two different companies, institutes or external universities, or combinations of the previous. For example, a person enrolled in the full-time degree programme could do two internships, each lasting 3 months. If the internship is divided between two internship providers, the total internship must be 30 credits and the internship regulations apply in full to each of the two internships. This</li> </ol>

	<p>means two report sets and assessments.</p> <p>3. The third option is a combination of an internship of at least 20 credits and additional university courses, whereby the total package must be about 30 credits. The additional courses can be at an external university or at GIMA universities. The courses must be relevant and new (supplementary) to the GIMA curriculum. For this third option, a written request must be submitted to the GIMA course director and internship coordinator for acceptance. If the course is also considered relevant for the MSc thesis, the request must also be submitted to the MSc thesis coordinator.</p>
<b>Course objectives</b>	<p><i>The graduate will have:</i></p> <ul style="list-style-type: none"> <li>- Applied in practice and tested the theoretical and practical knowledge accumulated in modules 1-6 (GEO4-GIMA 1 – GEO4-GIMA6). The modules contributed to mastering the student's syllabus and improving the student's basis for graduation.</li> <li>- Acquired or increased technical experience, insight into business, and social and other skills.</li> <li>- Been given the opportunity to become familiar with a geo-information workplace.</li> </ul>
<b>Learning materials</b>	<ul style="list-style-type: none"> <li>- GIMA Master Internship Regulations;</li> <li>- Rubric for assessment of MSc GIMA version 2012-03.</li> </ul>
<b>Examination</b>	<p><i>Internship (options 1, 2 and 3 above):</i></p> <ul style="list-style-type: none"> <li>- Professional skills 45%</li> <li>- Internship report or article 45%</li> <li>- Personal reflection report 10%</li> </ul> <p>The assessment of professional skills is done by the supervisor of the providing internship. The internship report/article and personal reflection report are assessed by the GIMA supervisor. The elements are graded according to the developed rubric of assessment for internships. The elements of assessment are:</p> <p><b>A Professional skills (45%)*</b></p> <ol style="list-style-type: none"> <li>1. Initiative and creativity</li> <li>2. Insight in functioning of another organization</li> <li>3. Adaptation capacity</li> <li>4. Commitment and perseverance</li> <li>5. Independence</li> <li>6. Handling supervisor's comments and development skills</li> <li>7. Time management</li> </ol> <p><b>B Report internship (45%) *</b></p> <ol style="list-style-type: none"> <li>1. Formulation goals, frame work project</li> <li>2. Theoretical underpinning, use of literature</li> <li>3. Use of methods and processing data</li> <li>4. Reflection on results</li> <li>5. Conclusions and discussion</li> <li>6. Fluency of language and writing skills</li> </ol> <p><b>C Personal reflection on internship (10%)*</b></p> <ol style="list-style-type: none"> <li>1. Report on personal reflection</li> </ol> <p><i>Optional additional university course (option 3 above):</i>          As defined in the description of the course in the course catalogue or study guide concerned.</p>

<b>Exemption</b>	An internship exemption is possible when specific conditions are fulfilled as described in the Internship regulations below (article 7).
<b>Schedule</b>	Not applicable
<b>Degree of freedom</b>	<i>Optional university course (approx. 10.0 ECTS)</i>
<b>Regulations</b>	<p><b>Article 1 – General</b></p> <ol style="list-style-type: none"> <li>1. These regulations on the internship (in Dutch <i>stage</i>; also referred to in English as the work placement or traineeship) apply to all students enrolled in the GIMA MSc degree programme, whether full-time or part-time.</li> <li>2. The final stage of the programme includes a mandatory internship period of 30 ECTS. The duration of this internship will be at least 6 months for full-time students or 12 months for part-time students, excluding public holidays, personal holidays and sick leave.</li> <li>3. There are three options to fill in the internship period:       <ul style="list-style-type: none"> <li>- The first option is that the internship (30 ECTS) is done in one company, institute or university.</li> <li>- The second option is that the internship can be done at two different companies, institutes or external universities, or combinations of the previous. For example, a student enrolled in the full-time degree programme could do two internships, each lasting 3 months. If the internship is divided between two internship providers, the total internship must be 30 ECTS and the internship regulations apply in full to each of the two internships.</li> <li>- The third option is the combination of an internship of at least 20 ECTS and additional university courses, whereby the total package must be about 30 credits. The additional courses can be at an external university or at GIMA universities. The courses must be relevant and new (supplementary) to the GIMA curriculum. For this third option, a written request must be submitted to the GIMA course director and internship coordinator for acceptance. If the course is also considered relevant for the MSc thesis, the request must also be submitted to the MSc thesis coordinator.</li> </ul> </li> <li>4. The internship will preferably not be in one of the universities involved in GIMA.</li> </ol> <p><b>Article 2 – Aims of the internship</b></p> <ol style="list-style-type: none"> <li>1. To apply in practice and test the theoretical and practical knowledge the student has accumulated in the first six modules, thereby contributing to mastering the student's syllabus and improving the student's basis for graduation.</li> <li>2. To enable the student to acquire or increase technical experience, insight into business, and social and other skills.</li> <li>3. To give the student the opportunity to become familiar with a geo-information workplace.</li> </ol> <p><b>Article 3 – Organization and set-up</b></p> <ol style="list-style-type: none"> <li>1. The internship will be done in either of the following: commercial companies, non-profit organizations or research institutes in the Netherlands or abroad.</li> <li>2. The work the student is expected to do must be of a level appropriate for a person with a university master degree in geo-information.</li> <li>3. The student is expected to take the initiative to find an internship, if necessary aided by the GIMA internship coordinator appointed on behalf of the four GIMA universities.</li> <li>4. When looking for and arranging their internship, students may use the designated notice board (on Blackboard) or contact the <i>GIMA internship coordinator</i>.</li> <li>5. The internship workplace and internship assignment will be chosen in</li> </ol>

	<p>consultation with the GIMA <i>internship supervisor</i>.</p> <ol style="list-style-type: none"> <li>6. Wherever possible, an internship agreement will be drawn up between the internship providing party and the student.</li> <li>7. Well before the commencement of the internship the student will submit a concise internship plan to the <i>internship supervisor</i> in the GIMA institution concerned, for approval.</li> <li>8. The internship plan must contain information about the period of the internship, the providing internship organization, the supervision of the providing organization, the location, an estimate of the level of the duties, and the name, address, telephone and email details of the <i>internship provider supervisor</i>.</li> </ol> <p><b>Article 4 - The GIMA internship supervision</b></p> <ol style="list-style-type: none"> <li>1. In consultation with the GIMA internship coordinator and before beginning the internship, the student will be assigned an internship supervisor from one of the GIMA universities.</li> <li>2. The GIMA internship supervisor must approve the student's internship plan before the student starts the internship.</li> <li>3. The GIMA internship supervisor is responsible for checking the suitability of the content and standard of the student's internship duties.</li> <li>4. The day-to-day supervision of the student is the responsibility of the internship provider supervisor from the internship organization.</li> <li>5. If the provider supervisor and/or student have any complaints or problems they should take them to either the GIMA internship supervisor or the GIMA internship coordinator.</li> </ol> <p><b>Article 5 – The internship report</b></p> <ol style="list-style-type: none"> <li>1. The student will hand in three written documents: a report or article, a summary of the internship and a personal reflection report.</li> <li>2. The student will write a report or article of the work done during the internship and submit it as a digital document, no later than 1 month after the internship has ended. A report must be at least 25 A4-pages long. An article can either be for a professional or peer-reviewed publication. Verification of publication of the article must be given to the GIMA internship supervisor and -coordinator. The article must be at least 8 A4-pages long.</li> <li>3. One copy of the report or article will be given to the GIMA internship supervisor, one copy is for the internship provider and the third copy is for the GIMA internship coordinator.</li> <li>4. The report must contain at least the following: <ul style="list-style-type: none"> <li>- a description of the student's introduction in and supervision within the providing internship organization;</li> <li>- a description of the nature and organizational structure of the internship providing party;</li> <li>- the student's duties during the internship;</li> <li>- a reflection on results and products made. It is expected that conclusions, recommendations and discussions of the results and made products are well-founded.</li> </ul> </li> <li>5. A digital summary of the internship report (approximately 1000 words) must be submitted. It will be posted on Blackboard for a period of at least 4 years. This document must be sent to the GIMA supervisor and coordinator.</li> <li>6. A personal reflection paper is made. The reflection paper must contain the following: <ul style="list-style-type: none"> <li>- the student's academic opinion of the level and usefulness of the internship and the terms of employment;</li> <li>- the student's academic opinion of the contribution or non-contribution of each GIMA module to the internship;</li> <li>- the student's academic opinion of what is lacking in the GIMA curriculum in relationship to the tasks carried out during the internship.</li> </ul> </li> </ol>
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	<p>The reflection paper must be at least 3 A4-pages long. A copy of the personal reflection report will be sent to the GIMA internship supervisor and coordinator.</p> <p><b>Article 6 - Assessment</b></p> <ol style="list-style-type: none"> <li>1. The internship has three assessment parts. These are professional skills, internship report or article and personal reflection paper. The contribution percentage of each assessment part to the final mark is as follows:       <ul style="list-style-type: none"> <li>- Professional skills 45%</li> <li>- Internship report or article 45%</li> </ul> </li> <li>2. Personal reflection report 10%        The internship provider will assess the professional skills. The internship report or article and personal reflection report will be assessed by the GIMA internship supervisor. The assessment form is available from the GIMA internship coordinator or can be downloaded from Blackboard.</li> <li>3. All parts are assessed according to GIMA guidelines given in a rubric. The rubric is available from GIMA internship coordinator or can be downloaded from Blackboard.</li> <li>4. Students who do not submit their internship report to their internship supervisor before the 1-month deadline for submission has expired will be penalised: their maximum final mark will be reduced from 10 to 6.</li> <li>5. The GIMA internship supervisor submits the assessment form to the GIMA internship coordinator and GIMA course secretary.</li> </ol> <p><b>Article 7 – Exemption</b></p> <ol style="list-style-type: none"> <li>1. A student may only be exempted from the internship requirement if the following conditions are met:       <ul style="list-style-type: none"> <li>- proof can be supplied that the student has a minimum of 3 years work experience in a geo-information environment;</li> <li>- the student has written a 3000-word essay (in English or Dutch) discussing how the work he or she did in the geo-information environment is related to the GIMA modules;</li> <li>- the student has handed in a portfolio of the projects in which he or she was involved when working in a geo-information environment;</li> <li>- the student has submitted a written request for exemption to the GIMA Examination Committee.</li> </ul>       All documents relating to the points above must be submitted to the GIMA Examination Committee through the GIMA programme director.     </li> <li>2. In the event of a situation arising that is not covered by these internship regulations, or if there is good reason to deviate from these regulations, a written request must be submitted to the GIMA Examination Committee. The final decision rests with this GIMA Examination Committee.</li> </ol>
<b>Remarks</b>	<p><b>Graduation ceremony and deregistration</b></p> <p>Upon successfully completing the thesis OR the internship as the last course module, the student can choose to obtain the diploma during a graduation ceremony (which is earliest the next examination date after the last assessment results have been submitted), or to receive the diploma by mail carrier (see also: Completion of MSc GIMA programme, in the section General Information of this course catalogue.</p>



**Module 8: Thesis**

<b>Course name</b>	<b>Thesis</b>
<b>Course code</b>	<b>GEO4-GIMA8</b>
<b>ECTS credits</b>	30.0
<b>Level</b>	Master
<b>Course language</b>	English
<b>Period/time-slot</b>	All time (six months fulltime or twelve months parttime)
<b>Coordinators</b>	Main: [t] +31 (0) 15 278 2714 Sisi Zlatanova (TUD) [e] <a href="mailto:s.zlatanova@tudelft.nl">s.zlatanova@tudelft.nl</a>  Assistant: [t] <i>to be appointed</i> [e]
<b>Lecturers</b>	All GIMA staff
<b>Entry requirements</b>	<ul style="list-style-type: none"> <li>- Letter of acceptance of the master programme Geographical Information Management and Applications</li> <li>- Passed at least five out of six content modules (GEO4-GIMA1 to GEO4-GIMA6)</li> </ul>
<b>Activities / Education</b>	Independent thesis research
<b>Themes</b>	Thesis
<b>Profile</b>	This is the last or one but last module, where the student needs to prove he/she can master all knowledge and skills in the form of a thesis.
<b>Contents</b>	The (individual) academic research that results in a master thesis deals with a specific need or issue that is relevant to the present-day practice of geo-information management and application. In some cases the subject of the thesis will originate from a student project carried out in module 6 or the internship; in other instances the subject of the thesis will be brought in front by the candidate or GIMA lecturers. In all cases the subject of study should reflect the main objectives of the GIMA programme.
<b>Course objectives</b>	<i>After successful completion, the student will be able to:</i> <ul style="list-style-type: none"> <li>- Demonstrate her/his ability to use and integrate knowledge and competences acquired in the six modules and preferably the internship for an advanced, master level research, development and/or design project that adheres to international scientific standards and shows originality and scholarship.</li> <li>- Demonstrate her/his ability to present the process and the results of the project in both written and oral format and to defend and discuss one's work in conformity with international scientific conventions.</li> </ul>
<b>Learning materials</b>	GIMA Master Thesis Regulations
<b>Examination</b>	<i>Entry requirement for the thesis defence:</i> Must have passed all six content modules GEO4-GIMA1 to GEO4-GIMA6.

	<ul style="list-style-type: none"> <li>- Written thesis (50%)</li> <li>- Research/design process (30%)</li> <li>- Presentation (10%)</li> <li>- Discussions (10%)</li> </ul> <p><i>Percentages subject to amendments.</i></p>								
<b>Examination dates 2013-2014</b>	<p>At the following dates, the final defences will be assessed:</p> <ul style="list-style-type: none"> <li>- Thursday August 29<sup>st</sup>, 2013, UU, Utrecht</li> <li>- Monday December 16<sup>th</sup> 2013, UU, Utrecht</li> <li>- Friday March 28<sup>st</sup>, 2014, WUR, Wageningen</li> <li>- Wednesday July 2<sup>nd</sup> 2014, TUD, Delft</li> </ul> <p>In general rule, the defences will be presented in the afternoon of the designated date. The mid-term presentations will take place at the same date in the morning. The only exception to this rule is Thursday August 29<sup>th</sup>, 2013, at UU, Utrecht; on this day, only defences will take place. The midterms take place on <i>Friday September 6<sup>th</sup>, 2013, at UT-ITC, Enschede.</i></p> <p><b>In the event there is a large amount of candidates, the dates for the mid-term presentations might alter with one or two days. Due to the go/no-go decisions (see procedures), this might occur within four weeks before the deadline. Communication will be done via e-mail to the involved persons, and will also be communicated via BlackBoard.</b></p>								
<b>Exemption</b>	Not possible								
<b>Schedule</b>	<table> <tr> <td>Friday (week 27):</td> <td>Lectures, Scientific writing course</td> </tr> <tr> <td><i>Given moment 1:</i></td> <td>Mid-term attendance</td> </tr> <tr> <td><i>Given moment 2:</i></td> <td>Mid-term presentation</td> </tr> <tr> <td><i>Given moment 3:</i></td> <td>Thesis Defense presentation</td> </tr> </table>	Friday (week 27):	Lectures, Scientific writing course	<i>Given moment 1:</i>	Mid-term attendance	<i>Given moment 2:</i>	Mid-term presentation	<i>Given moment 3:</i>	Thesis Defense presentation
Friday (week 27):	Lectures, Scientific writing course								
<i>Given moment 1:</i>	Mid-term attendance								
<i>Given moment 2:</i>	Mid-term presentation								
<i>Given moment 3:</i>	Thesis Defense presentation								
<b>Degree of freedom</b>	<i>Not applicable</i>								
<b>Regulations</b>	<p><b>Article 1 – General</b></p> <ol style="list-style-type: none"> <li>1. These regulations apply to all students enrolled in the GIMA MSc programme, whether full-time or part time.</li> <li>2. The last or one but last part of the programme consists of carrying out a scientific research, development and/or design project resulting in a written thesis and two presentations.</li> <li>3. In line with the objectives of the GIMA programme, the master thesis should have a substantial empirical and/or design content.</li> <li>4. Students are expected to work on their thesis for a time period equivalent to 30 ECTS.</li> <li>5. The thesis should be based on individual, independent and original research, development and/or design work.</li> <li>6. The thesis project may deal with an issue of interest to the student's employer under strict conditions relating to the scientific level and independence of the thesis project, as well as clarity on the final say by supervisor and professor.</li> <li>7. Part of the thesis work may be conducted outside the Netherlands with 'distance supervision'. A special arrangement should be drafted and approved by the student, the supervisor and the Thesis Coordinator (see Article 4 below). The arrangement should specify tasks and responsibilities of the student and the supervisor and arrangements for regular communication.</li> </ol> <p><b>Article 2 – Aims of the master thesis</b></p> <ol style="list-style-type: none"> <li>1. <i>See course objectives above</i></li> </ol>								

**Article 3 – Scientific standards**

1. Both the research, development and/or design, as well as the written thesis and publications, will have to adhere to international scientific standards.
2. The thesis should include:
  - a. an introduction to and conceptualization of the topic (conceptual model based on an international review of relevant scientific literature),
  - b. clearly stated goals and objectives,
  - c. a dedicated, well worked out and justified methodology and application of methods and techniques,
  - d. a transparent description of the work process and the outcomes of the study,
  - e. a thorough, critical discussion of results in line with the project goals and objectives, and
  - f. an abstract or summary, publishable in a magazine for peers.
3. The thesis has to be produced according to international standards for a scientific publication with respect to complete listing of sources used, full insight into methods used and systematic literature references.
4. During the project, the Dutch code of conduct for scientific work (The Netherlands Code of Conduct for Scientific Practice) of the Association of Universities in the Netherlands has to be followed.
5. Plagiarism or other scientific misconduct will not be accepted. Submitted theses will be checked on plagiarism with the help of plagiarism detection software. In case of plagiarism, the Thesis Examination Committee will decide not to assess the thesis, further consequences will be decided by the GIMA Examination Board.

**Article 4 – Organization**

1. The Board of the GIMA MSc programme appoints MSc Thesis Coordinator and a second, substitute coordinator. The Thesis Coordinator executes his/her task in accordance with the Programme Director.
2. The Thesis Coordinator organizes the contacts, meetings, seminars, et cetera of the thesis phase of the GIMA programme, monitors the progress of the thesis projects and resolves conflicts between students and supervisors.
3. The Thesis Coordinator informs the GIMA Program Director on a regular base in favour of the overall organization of Midterm presentations, Defences and Examinations
4. Students can choose to propose a theme, approach and/or supervisor for the thesis project themselves or select a theme/approach/supervisor from a list posted on the GIMA Blackboard site. The list will be maintained by the Thesis Coordinator and will be updated at the beginning of every school year.
5. The students make their choice/preference known to the Thesis Coordinator and he/she will discuss the preferences with the students and try to grant the requests or mediate an alternative.
6. The Thesis Coordinator takes the final decision about the allocation of projects and supervisors.
7. Each student will be allocated one supervisor, who takes care of 'daily' supervision, and a reviewer who will read and co-assess the thesis when officially submitted for defence. The reviewer must be from a university, different than the university of the supervisor(s).
8. Each student will be allocated one full professor (from the same university as the supervisor) guarding for the scientific quality (see Article 3) by approving the research outline and study plan (see Articles 5.1 a/b and 6.1) and final thesis.
9. The total amount of time available for supervision is 50 hours, including the time of the supervisor(s), reviewer, full professor, and Thesis Coordinator.
10. The student prepares a thesis plan, which has to contain detailed information about research topic, methodology, time schedule and contact hours with the

	<p>supervisors. The thesis plan has to be submitted to the Thesis Coordinator, who uses it to register formally the begin of the research period.</p> <p><b>Article 5 – Phasing</b></p> <ol style="list-style-type: none"> <li>1. The project work follows the regular phasing of a scientific study:       <ol style="list-style-type: none"> <li>a. developing a thesis plan (theme, objectives, approach, schedule, contact hours),</li> <li>b. writing the first chapters based on the literature review, resulting in a conceptual model and an analysis/design scheme,</li> <li>c. carrying out empirical analysis and/or design activities,</li> <li>d. writing the empirical and/or design chapters,</li> <li>e. writing the final chapters on interpretation of results, evaluation and discussion.</li> </ol> </li> <li>2. After the phases a and b are completed, students have to participate in a seminar in which they will report, within a 20 minutes presentation, on their progress and discuss their and other progress reports.</li> <li>3. Upon approval of the completed research by the responsible professor and the supervisor, the student submits at least 5 printed copies of his/her thesis and a CD-ROM or DVD with a PDF-file containing the thesis text and illustrations and, when applicable, produced data sets and software. <i>Further details about the submission requirements are given under Procedures below.</i></li> <li>4. After the thesis is finished and all content modules GEO4-GIMA1 to GEO4-GIMA6 have been successfully completed, the student will give a second (graduation) presentation of 30 minutes on the outcomes of his study and defend the research by participating in discussion. <i>Further details are given under Procedures below.</i></li> <li>5. The Thesis Coordinator will organize four seminars per year to accommodate these presentations during the ‘contact education’ period.</li> <li>6. Before starting a MSc thesis project every student must have to attend the one day Introduction on research skills and thesis writing. The Thesis Coordinator will organize this introduction twice a year.</li> <li>7. During the MSc thesis project every student must attend at least one more session of midterm presentations. All attendances will be registered on behalf of the Thesis Coordinator.</li> </ol> <p><b>Article 6 – Assessment</b></p> <ol style="list-style-type: none"> <li>1. After phase a mentioned in article 5.1, a go/no-go decision on the project will be taken by the supervisor and professor and discussed with the student. The go/no-go decision is registered by the Thesis Coordinator.</li> <li>2. In case of a no-go decision, the student has first to revise his/her Thesis Plan before he/she can continue with the project work. The coordinator has to be involved in the guidelines for revision given by the supervisor.</li> <li>3. After the phases a and b are completed a mid-term review will take place. Part of this review is the presentation as mentioned in art. 5 part 2. After the presentation, the supervisor will review progress and presentation with the student and report the outcome to the Thesis Coordinator.</li> <li>4. After all the phases are completed, the student submits his work to the responsible professor and supervisor, who approve the research and inform the Thesis Coordinator.</li> <li>5. In case the work is not accepted, the student has to revise/extend his work according to the recommendations of the supervisors. The required additional work and expected delay is registered by the Thesis Coordinator.</li> <li>6. In case the work is still not acceptable after the revision based on these recommendations, a new thesis project has to be started.</li> <li>7. After the presentation mentioned in article 5, part 4, the student will receive a written and motivated individual assessment of the thesis work with a mark between 1 and 10, undersigned by supervisor and reviewer. <i>Further details are given under Procedures below.</i></li> <li>8. All MSc-theses graded with a positive mark will be made public with a short</li> </ol>
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	<p>announcement in national and international magazines by the Thesis Coordinator.</p> <p>9. <i>The weights for the different parts of the thesis work can be found under examination.</i></p> <p>10. The MSc thesis will be available for the public via the digital UU thesis library. Theses that obtained a mark 7 or higher are published on the GIMA website. All MSc theses will be available on Blackboard.</p> <p><b>Article 7 – Final regulations</b> In the event of a situation arising that is not covered by these master thesis regulations, or when there is a good reason to deviate from these regulations, a written request can be submitted to the GIMA Examination Board by the student and/or the supervisor. The final decision rests with the GIMA Examination Board.</p>
<p><b>Procedures</b></p>	<p><b>The rounding off of the MSc research</b> When rounding off the graduation research and completing the thesis, the student is expected to have fulfilled the final requirements and be ready to defend his/her research.</p> <p>The thesis must be written in English and must contain a one-page-long summary. The thesis must be prepared in A4 format, must have a binding system, and must use the GIMA cover page.</p> <p><b>Four weeks</b> before the graduation presentation date, at the very latest, the supervisor must inform the GIMA MSc Thesis Coordinator about the upcoming defence and will request assembling of the MSc. Thesis Examination Committee.</p> <p><b>Four weeks</b> before the graduation presentation date, at the very latest, the student must submit at least 5 printed copies of his/her thesis and a CD-ROM with a PDF-file containing the thesis text and illustrations (if applicable, produced data sets and software) to the MSc Thesis Coordinator and the thesis supervisors. The MSc Thesis Coordinator will distribute the material to the MSc Thesis Examination Committee and the GIMA Secretariat.</p> <p><b>The Examination Components</b> The examination is split up into the following four parts, which are to be considered by the GIMA MSc Thesis Examination Committee (TEC):</p> <ol style="list-style-type: none"> <li>1. written thesis,</li> <li>2. research process,</li> <li>3. graduation presentation,</li> <li>4. discussion.</li> </ol> <p><b>1. The written thesis</b> The written thesis is the most important part of the evaluation. While evaluating the thesis, the following three general points are taken into consideration:</p> <ul style="list-style-type: none"> <li>- scientific content and level: problem definition, relevance of research questions, critical discussion, understanding and mastering of the topic and innovation.</li> <li>- scientific method: methodology, appropriateness of case studies, data and data collection procedures, objectives vs. results and conclusions.</li> <li>- presentation of the work: structure, logical sequencing, insight revealed, layout, organization, language use, total length and expressive skills.</li> </ul> <p><b>2. The research process</b> This part of the evaluation judges the candidate's working method and actual research process. The following important points are considered:</p> <ul style="list-style-type: none"> <li>- originality and motivation,</li> <li>- independence of thought and own initiative,</li> <li>- planning of time and how that has been adhered to,</li> </ul>

	<ul style="list-style-type: none"> <li>- communication with supervisors and other involved staff.</li> </ul> <p><b>3. The graduation presentation (public)</b>          The graduation presentation is oral and lasts for 30 minutes. The presentation should be of an academic standard and should expose the thesis motivation, followed approach and obtained results in the best possible way. The aspects to be assessed in the oral presentation are:</p> <ul style="list-style-type: none"> <li>- structure, logical sequencing, insight revealed,</li> <li>- quality of the overhead slides, organization, use of language, length, expressive skills.</li> </ul> <p><b>4. The discussion (public)</b>          The discussion is the process of defending the thesis in the presence of the GIMA MSc Thesis Examination Committee (TEC) and the public. The discussion always takes place after the graduation presentation has been given. Generally, such sessions last between 30-35 minutes. The GIMA MSc Thesis Committee members ask questions first, starting with the reviewer. After the members of the TEC, the public is invited to ask questions.</p> <p>Questions can be asked which:</p> <ul style="list-style-type: none"> <li>- focus directly on the thesis and work on the thesis,</li> <li>- pertain to subjects directly related to the field of study in which the student is graduating.</li> </ul> <p><b>The Assessment Approach</b>          The whole graduation process is assessed by the TEC consisting of <u>at least 3 persons</u> (from GIMA programme):</p> <ul style="list-style-type: none"> <li>- the supervisor (GIMA staff member),</li> <li>- a reviewer (the reviewer will only review the final report),</li> <li>- the chairperson of the TEC (a member of the GIMA Examination Committee).</li> </ul> <p>In exceptional cases, if no member of the GIMA Examination Committee is available, the GIMA Examination Committee appoints a chairperson.</p> <p>If the thesis research is practically oriented (involving a supervisor from a company), then the supervisor will be invited to witness the defence of the thesis. The GIMA supervisor will seek opinions about the quality of the research undertaken from the same practical supervisor and will subsequently report these findings to the TEC.</p> <p>The MSc Thesis Examination Committee evaluates the MSc project results with respect to the four Examination Components during a closed session (15-20 min) bearing in mind the knowledge and skills that the GIMA student is expected to possess by the time he/she has completed his/her studies. This is to say, the student should be able to demonstrate capabilities of:</p> <ul style="list-style-type: none"> <li>- working in an individual and independent fashion,</li> <li>- overseeing the implications of an assignment,</li> <li>- carrying out research,</li> <li>- demonstrating professional competence,</li> <li>- giving written and oral presentations,</li> <li>- carrying out discussions.</li> </ul> <p>The MSc Thesis Examination Committee draws up proposals for:</p> <ul style="list-style-type: none"> <li>- the marks to be given for each of the four graduation components,</li> <li>- the final mark.</li> </ul> <p>The final mark is based on the four graduation components, which are weighted according to the percentages as stated under <i>examination</i>.</p>
<b>Remarks</b>	<b>Graduation ceremony and deregistration</b>



	<p>Upon successfully completing the thesis OR the internship as the last course module, the student can choose to obtain the diploma during a graduation ceremony (which is earliest the next examination date after the last assessment results have been submitted), or to receive the diploma by mail carrier (see also: Completion of MSc GIMA programme, in the section General Information of this course catalogue, and the GIMA Module 8 (MSc thesis research) step-by-step guidelines for course participants below).</p>
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## GIMA Module 8 (MSc thesis research) step-by-step guidelines for course participants

### Notes:

These “step-by-step” guidelines complement the official “GIMA Master Thesis Regulations” and the “Procedure MSc Thesis Examination Regulations”, as they are published in Blackboard and in this Course Catalogue. In case of doubt, the official Regulations are leading. The guidelines below are only meant to assist GIMA course participants in their planning of activities.

The course participants themselves are responsible for time planning and management and for executing the steps listed below.

### Contact details GIMA Module 8 Co-coordinator:

Sisi Zlatanova: [s.zlatanova@tudelft.nl](mailto:s.zlatanova@tudelft.nl) (tel: +31 15 2782714)

### Snail mail address:

Sanne van der Neut (GIMA Secretary) ([gima@geo.uu.nl](mailto:gima@geo.uu.nl)), c/o University of Twente, Faculty ITC, Department of Geo-Information Processing, P.O. Box 217, 7500 AE Enschede / Hengelosestraat 99, 7514 AE Enschede, the Netherlands

### Starting up

- Before starting with the thesis research, every student must participate in an one day introduction on research skills and thesis writing, organized by one of the GIMA Module 8 Co-coordinators.
- Find topic. You may either formulate your own research topic or select one from those that are offered / suggested in GIMA Blackboard Module 8. The (individual) research that results in a MSc thesis deals with a specific need or issue that is relevant to the present-day practice of geo-information management and applications.
- Find supervisor(s). Contact a supervisor from one of the 4 GIMA universities of whom you think he / she is knowledgeable in your intended field of research and discuss your research ideas with him / her. You may find a potential supervisor knowledgeable because of the subjects he / she taught in earlier GIMA modules, or you may have a look at the list of potential supervisors with their fields of specialization in this course catalogue, or you may find the name connected to the proposed topics.
- Course participants may only proceed to the next step in case they have completed (passed) at least 5 of the first 6 GIMA Modules (1 to 6).
- Complete form “research identification” (BB\_Form in Blackboard) and submit this form to the GIMA Module 8 Co-ordinator Sisi Zlatanova (with cc. to GIMA Secretary Sanne van der Neut). After the approval of this research identification by the Module 8 Co-ordinator you are formally registered for the GIMA thesis research (Module 8).
- Make sure that you are formally registered at Utrecht University as a participant of the GIMA programme.
- Students with a supervisor from Wageningen University will also have to complete a so-called “bijvakformulier”, that is available through the GIMA Blackboard module.
- Later on in the thesis research process you will have to give a mid-term presentation of your work (see below). In addition to that, you will have to attend at least one other session of GIMA MSc thesis research mid-term presentations held 4 times a year at one of the universities. It is best to plan your attendance to one of these sessions as early as possible. Your actual attendance will be registered during the sessions.

### Extended research proposal

- Prepare an extended research proposal / thesis plan (see “Template for thesis plan” in Blackboard) and ask your supervisor(s) for approval. There is no need to ask for the approval of the responsible professor as well. It is left

to your supervisor to inform the responsible professor or ask for his/her approval. The same holds for other situations in this procedure where you need the approval of the supervisor(s).

- Send the extended research proposal / thesis plan with the approval of the supervisor(s) to the GIMA Module 8 Co-ordinator Sisi Zlatanova (with cc. to GIMA Secretary Sanne van der Neut). This must be done 4 weeks before the date of the mid-term presentation, at the latest.

### **Mid-term presentation**

- Ask your supervisor(s) for their approval of you giving your mid-term presentation.
- Inform the GIMA Module 8 Co-ordinator Sisi Zlatanova (with cc. to GIMA Secretary Sanne van der Neut) about your planned date for the mid-term presentation and the approval of the supervisor(s). This must be done 4 weeks before the planned date of the mid-term presentation, at the latest.

*Note: the "rules" are as follows:*

*"After the phases a and b are completed, students have to participate in a seminar in which they will report, within a 20 minutes presentation, on their progress and discuss their and other progress reports."*

*"These phases a and b are:*

- o *developing a thesis plan (theme, objectives, approach, schedule, contact hours),*
- o *writing the first chapters based on the literature review, resulting in a conceptual model and an analysis/design scheme"*
- Prepare for and give your mid-term presentation (duration 20 minutes + 10 minutes for questions).
- Immediately after the mid-term presentation you must complete the mid-term thesis review form together with your supervisor, who has to sign it. The form can be found in GIMA Blackboard Module 8 (>Documents>Forms and Templates). The signed form must be submitted to the GIMA Module 8 Co-ordinator Sisi Zlatanova.

### **Research completion and thesis defense**







- GIMA thesis research must be finished 4 weeks before the date of the final (graduation) presentation / thesis defense: on that date (i.e. 4 weeks before the final defense), at the very latest, the final thesis (approved by the supervisor(s)) must be submitted in digital format to GIMA Module 8 Co-ordinator Sisi Zlatanova.
- "Final thesis" ALSO means: 3 printed copies, plus one digital copy in pdf format on CD-ROM or on DVD. If applicable, this CD-ROM or DVD should also contain the produced data sets and software. These three printed copies and the CD-ROM / DVD should be sent to GIMA Secretary Sanne van der Neut (see snail mail address above) and should also be at UT-ITC in Enschede 4 weeks before the final defense).
- The GIMA course participant him/herself submits additional printed copies of the final thesis to his or her supervisor(s) and the responsible professor (So, at least 2 copies. The number of copies increases if there are more supervisors involved).
- For the "final thesis" the GIMA cover page must be used, which can be found in GIMA Blackboard Module 8 (>Documents>Forms and Templates). The printed thesis must also be bound (glue or spiral).
- Defend your thesis in a public graduation presentation of 30 minutes duration on one of the 4 GIMA thesis defense days that are organized every year. Immediately after the presentation you will have to answer the questions posed by the members of the TEC and public. The duration of this discussion is also 30 minutes.
- Shortly before, on, or immediately after your defense day: complete the forms "Student assessment of Module 8" and "Alumni form". Both forms can be found in GIMA Blackboard Module 8 (>Documents>Forms and Templates). The forms must be submitted to GIMA Module 8 Co-ordinator Sisi Zlatanova.







### **After the defense**







- After your defense day: upload the digital version of your thesis to the digital UU thesis library ( <https://osiris.library.uu.nl/scrol2/index.html?ou=GEO> ).
- If you have successfully completed all GIMA modules, you should now check in OSIRIS whether all marks are there and correct.
- If you have also completed the internship, the next step is to apply for graduation through the form which can be found at: [http://www.formdesk.com/universiteitrecht/GEO\\_applyforMAGraduation](http://www.formdesk.com/universiteitrecht/GEO_applyforMAGraduation)
- For the next steps in your career, it is worthwhile to consider to publish your GIMA thesis research results in a scientific or professional journal or to present it at a conference. This is normally done in consultation with your supervisor, who will then be a co-author. Successful publications will be presented on the GIMA website.


## Staff Information

Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
UT-ITC	Ir.	<b>Augustijn, Ellen-Wien</b> Simulation models Data structures and analysis	1 8		+31 (0) 53-4874414 <a href="mailto:p.w.m.augustijn@utwente.nl">p.w.m.augustijn@utwente.nl</a>	ITC 2-068
WUR	Prof Dr. Ir.	<b>Bregt, Arnold</b> Spatial Data Infrastructures and Environmental Modelling Land Use	0 3 8		+31 (0) 317-481699 <a href="mailto:arnold.bregt@wur.nl">arnold.bregt@wur.nl</a>	GAIA C310
WUR	Dr. Ir.	<b>Clevers, Jan</b> Remote Sensing: Crop Monitoring, Vegetation Indices, Vegetation Monitoring, Imaging Spectroscopy	1 8		+31 (0) 317-481802 <a href="mailto:jan.clevers@wur.nl">jan.clevers@wur.nl</a>	GAIA C305
WUR	Dr. Ir.	<b>de Bruin, Sytze</b> Spatial data quality assessment and modelling Remote sensing, uncertainty analysis, geostatistics, spatial variation	8		+31 (0) 317-481830 <a href="mailto:sytze.debruin@wur.nl">sytze.debruin@wur.nl</a>	GAIA C308E
UT-ITC	Dr. Ir.	<b>de By, Rolf</b> Space-time data Storage and computation Social networks Databases	8		+31 (0) 53-4874553 <a href="mailto:r.a.deby@utwente.nl">r.a.deby@utwente.nl</a>	ITC 2-054
UU	Dr.	<b>de Jong, Tom</b> Network Analysis Methods & techniques of human geography and planning	5 8		+31 (0) 30-2531393 <a href="mailto:t.dejong@uu.nl">t.dejong@uu.nl</a>	UNNIK 403

Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
TUD	Drs.	<b>de Vries, Marian</b> Distributed geo-information systems 3D Geodata Interoperability	6 8		+31 (0) 15-2784268 <a href="mailto:m.e.devries@tudelft.nl">m.e.devries@tudelft.nl</a>	OTB 2.230
UT- ITC	Dr. Ir.	<b>de Vries, Walter</b> Institutional, organizational and economic aspects of geoinformation, Strategy and management of geoinformation organizations and geoinformation infrastructures (SDIs)	1 4		+31 (0) 53-4874475 <a href="mailto:w.t.devries@utente.nl">w.t.devries@utente.nl</a>	ITC 3-016
UU	Dr.	<b>Geertman, Stan</b> Planning Support Systems Spatial Analysis Urban Planning	0 2 4 8		+31 (0) 30-2534527 <a href="mailto:S.C.M.Geertman@uu.nl">S.C.M.Geertman@uu.nl</a>	UNNIK 418B
WUR	Dr.	<b>Grus, Łukasz</b> Spatial Data Infrastructures Open data Basisregistraties (e.g. BRT)	3 8		+31 (0) 317-481697 <a href="mailto:lucas.grus@wur.nl">lucas.grus@wur.nl</a>	GAIA C214
WUR	Dr.	<b>Heuvelink, Gerard</b> Geostatistics Spatial Uncertainty Analysis	8		+31 (0) 317-482716 <a href="mailto:gerard.heuvelink@wur.nl">gerard.heuvelink@wur.nl</a>	GAIA B121
UU	Dr.	<b>Karssenber, Derek</b> Geostatistics and Dynamic modelling	5 6 8		+31 (0) 30-2532768 <a href="mailto:d.karssenber@uu.nl">d.karssenber@uu.nl</a>	ZON 103

Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
UT-ITC	Drs.	<b>Knippers, Richard</b> GI Education Mapping and Geovisualization Spatial Referencing	1 8		+31 (0) 53-4874450 <a href="mailto:r.knippers@utwente.nl">r.knippers@utwente.nl</a>	ITC 1-056
UT-ITC	Drs.	<b>Köbben, Barend</b> Distributed Geo-Services (Web)Cartography Web Applications	5 6 8		+31 (0) 53-4874253 <a href="mailto:b.j.kobben@utwente.nl">b.j.kobben@utwente.nl</a>	ITC 1-065
UT-ITC	Prof Dr.	<b>Kraak, Menno-Jan</b> Geovisualization	0 8		+31 (0) 53-4874463 <a href="mailto:m.j.kraak@utwente.nl">m.j.kraak@utwente.nl</a>	ITC 2-050
UT-ITC	Dr. Ir.	<b>Lemmens, Rob</b> Open GIS and internet GIS Mobile GIS and Interoperability Semantic modelling Crowd-sourcing, VGI	5 6 8		+31 (0) 53-4874529 <a href="mailto:r.j.lemmens@utwente.nl">r.j.lemmens@utwente.nl</a>	ITC 1-064
WUR	Dr.Ir	<b>Ligtenberg, Arend</b> GIS modelling for land use planning Information Management Spatial models Mobile applications 3D Visualization	6 8		+31 (0)317- 481845 <a href="mailto:arend.ligtenberg@wur.nl">arend.ligtenberg@wur.nl</a>	GAIA C212
UT-ITC	Dr.	<b>Morales, Javier</b> Design of geo-information services Architectures for distributed (geo-information) systems Spatial Data Infrastructures Web technology Business process management	8		+31 (0) 53-4874299 <a href="mailto:j.morales@utwente.nl">j.morales@utwente.nl</a>	ITC 1-058

Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
TUD	Drs.	<b>Quak, Wilko</b> Performance of spatial databases Geography Markup Language (GML) Oracle Spatial Topological and temporal modelling	8		+31 (0) 15-2783756 <a href="mailto:c.w.quak@tudelft.nl">c.w.quak@tudelft.nl</a>	OTB 2.260
WUR	Ir.	<b>Stuiver, John</b> Spatial data use and lineage in environmental applications Geodesy	7 8		+31 (0) 317-481628 <a href="mailto:John.stuiver@wur.nl">John.stuiver@wur.nl</a>	GAIA C308F
WUR	Ing.	<b>Ten Haaf, Willy</b> GI Education Geovisualization	2 8		+31 (0) 317-481865 <a href="mailto:willy.tenhaaf@wur.nl">willy.tenhaaf@wur.nl</a>	GAIA C309
UU	Drs.	<b>Toppen, Fred</b> AGILE Project Management and GI Education	4 8		+31 (0) 30-2533887 <a href="mailto:f.i.toppen@uu.nl">f.i.toppen@uu.nl</a>	UNNIK 419
UT-ITC	Dr.	<b>Van Elzakker, Corné</b> Uses, users and usability in GI processing and dissemination Cartography and Geovisualization	1 8		+31 (0) 53-4874478 <a href="mailto:c.vanelzakker@utwente.nl">c.vanelzakker@utwente.nl</a>	ITC 1-062
WUR	Dr. Ir.	<b>Van Lammeren, Ron</b> Representation of spatio-temporal phenomena Geodata visualization Spatial thinking Landscape architecture Land use planning Collaborative planning, Animal & human behaviour	8		+31 (0) 317-481553 <a href="mailto:ron.vanlammeren@wur.nl">ron.vanlammeren@wur.nl</a>	GAIA C306

Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
TUD	Dr. Ir.	<b>Van Loenen, Bastiaan</b> Information Policies Open data Spatial Data Infrastructures (SDI) Location privacy Land registration	3 8		+31 (0) 15-2782554 <a href="mailto:b.vanloenen@tudelft.nl">b.vanloenen@tudelft.nl</a>	OTB 1.240
TUD	Prof Dr. Ir.	<b>Van Oosterom, Peter</b> Spatial databases Map generalization (various-scale) Land administration	5 8		+31 (0) 15-2786950 <a href="mailto:p.j.m.vanoosterom@tudelft.nl">p.j.m.vanoosterom@tudelft.nl</a>	OTB 2.280
TUD	Ir.	<b>Welle Donker, Frederika</b> Open data	3 8		+31 (0) 15-2781383 <a href="mailto:f.m.welledonker@tudelft.nl">f.m.welledonker@tudelft.nl</a>	OTB 1.190
UT- ITC	Prof Mr. Dr.	<b>Zevenbergen, Jaap</b> Land administration systems	8		+31 (0) 53-4874351 <a href="mailto:j.a.zevenbergen@utwente.nl">j.a.zevenbergen@utwente.nl</a>	PGM 3-001
UU	Drs.	<b>Zeylmans van Emmichoven, Maarten</b> Geodata ArcGIS ERDAS/Imagine Remote Sensing	6 8		+31 (0) 30-2531237 <a href="mailto:m.j.zeylmansvanemmichoven@uu.nl">m.j.zeylmansvanemmichoven@uu.nl</a>	UNNIK 405
TUD	Dr. Dipl. Ing.	<b>Zlatanova, Sisi</b> 3D Data models 3D Data integration CityGML IndoorGML 3D Navigation 3D for emergency response	5 6 8		+31 (0) 15-2782714 <a href="mailto:s.zlatanova@tudelft.nl">s.zlatanova@tudelft.nl</a>	OTB 2.220

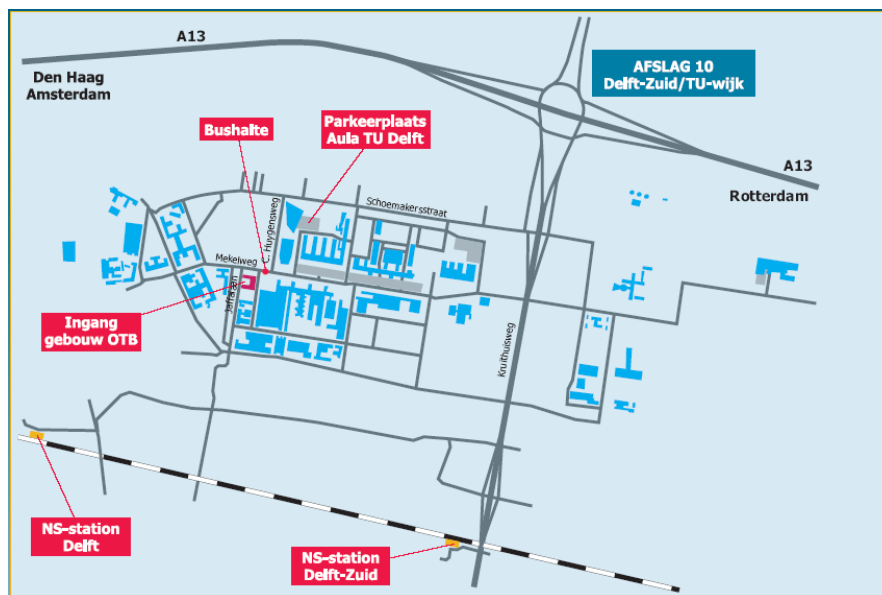
Inst.	Title	Name / Field of work	Mod.	Picture	Phone / Email	Room
UT- ITC	Dr. Ir.	<b>Zurita-Milla, Raul</b> Spatio-temporal analytics Geocomputation Quantitative methods Remote Sensing, GIS and VGI Data integration	2 8		+31 (0) 53-4874367 <a href="mailto:r.zurita-milla@utwente.nl">r.zurita-milla@utwente.nl</a>	GIP 2-066



## Course Venues

### Delft University of Technology

Technische Universiteit Delft  
 Onderzoeksinstituut OTB  
 Jaffalaan 9, 2628 BX Delft  
 Postbus 5030, 2600 GA Delft  
 tel. (015) 278 30 05  
 fax (015) 278 44 22  
 URL: <http://www.otb.tudelft.nl>  
 e-mail: [mailbox@otb.tudelft.nl](mailto:mailbox@otb.tudelft.nl)



#### Route description to OTB institute:

##### By public transport:

From Rotterdam/Dordrecht/Amsterdam/Schiphol/Den Haag/Utrecht:

Get off the train at NS-Station Delft. Take bus 51 (Zoetermeer Centrum West), 69 (Delft Zuid/TU wijk), 121 (Zoetermeer Centrum West via Pijnacker), 174 (Zoetermeer Centrum West via Bleiswijk) or 40 (Rotterdam Centraal Station). Get off at bus stop "Aula TU Delft" (bus 40 calls at Jaffalaan instead). Walk back and take the first turn to the left. The OTB institute is at number 9, building 30 (take the side exit, not the student affairs entrance!)

##### By car:

From the A13, heading Den Haag/Amsterdam and Rotterdam: exit Delft-Zuid. Keep the right hand side of the road, direction TU-Wijk. At the bottom of the viaduct, turn right (Schoemakersstraat). Then turn into the third street to the left (C. Huygensweg), end of the road turn right (Mekelweg). Then it is the second street left (Jaffalaan). You'll find sufficient parking space at the nearby Aula/Congress of Delft University.

## University of Twente - ITC

Faculty of  
 Geo-Information Science and  
 Earth Observation (ITC)  
 Hengelosestraat 99  
 7514 AE Enschede  
 Phone: +31 (0)53 4874 444  
 Fax: +31 (0)53 4874 400  
 URL: <http://www.itc.nl>  
 E-mail: [info-itc@utwente.nl](mailto:info-itc@utwente.nl)



### Route description to ITC:

#### By car:

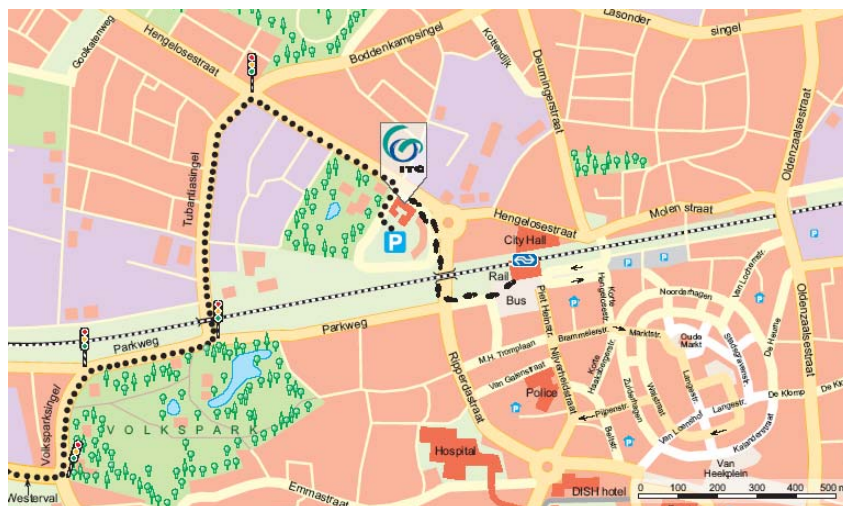
(assuming that you are coming from the west on the A1 Motorway)

- If Enschede is not mentioned on the road signs yet then follow directions to Hengelo until Enschede is mentioned.
- Take the A35, direction Enschede, then take exit number 26 "Enschede-West/Universiteit".
- At the exit follow the direction Enschede and continue at the Westerval to the traffic lights (approximately 4 km).
- Go straight ahead until the next traffic lights.
- Turn left to enter the Parkweg.
- Keep right at the next traffic lights.
- Turn left at the next traffic lights to enter the Volksparktunnel.
- At the next traffic light turn right to enter the Hengelosestraat.
- After about 500 m. turn right into the small service road (Fortuinstraat) alongside the ITC building.
- You will find a parking lot behind the building. Use the intercom at the barrier to gain admission to the car park.

#### By train

Coming from Schiphol Airport, there are direct trains to Enschede leaving a few minutes before every hour. Sometimes you need to change trains at Amersfoort and/or Hengelo station, usually on the other side of the platform.

- Coming out of the Enschede railway station (facing the bus station), walk to your right.
- Cross the street at the traffic lights and follow the pavement through the tunnel on your right.
- After 500 m. you will see the ITC building on your left.



## Utrecht University

Willem C. van Unnikgebouw  
Heidelberglaan 2  
3584 CS Utrecht  
tel: (+31) 30 253 2024  
fax: (+31) 30 254 0604

URL: <http://www.geo.uu.nl>



### Route description

#### By car:

##### From Amsterdam:

- A2, Exit Utrecht Noord
- Follow the N230 till A27
- A27, intersection Rijnsweerd direction De Uithof
- A28, First exit De Uithof

##### From Hilversum or Breda:

- A27, intersection Rijnsweerd direction De Uithof
- A28, First exit De Uithof

##### From Den Haag/Rotterdam or Arnhem:

- A12, junction Lunetten direction Amersfoort
- A27, intersection Rijnsweerd direction De Uithof
- A28, First exit De Uithof

##### From Den Bosch and Eindhoven:

- A2, junction Oudenrijn direction Amersfoort
- A27, junction Lunetten direction Amersfoort
- A28, First exit De Uithof

##### From Amersfoort:

- A28, Exit De Uithof (after exit Zeist/Den Dolder)

You'll arrive at the Uithof on the north side. Buildings are numbered. The Willem van Unnik building is number 2. There are several parking locations on the Uithof (see map). The Marinus Ruppert building is number 21.

#### By public transport:

##### From/to Utrecht Central Station:

- Every 3 or 5 minutes bus 11 and 12(s), exit at bus stop Heidelberglaan.



## Wageningen University and Research

Droevendaalsesteeg 3  
 Building: 100 + 101  
 6708 PB Wageningen  
 The Netherlands

URL: <http://www.wur.nl>



### Route description

#### By public transport:

All trains between Utrecht and Arnhem stop at Ede-Wageningen Station, with exception of the ICE-trains. Take bus line 88 to Wageningen Busstation and exit at bus stop Droevendaalsesteeg (bus departs from the southern exit 'zuid' of the railway station; coming from platform 3/4, turn left). For detailed travel information see [www.9292ov.nl](http://www.9292ov.nl), or the NS train journey planner, [www.ns.nl](http://www.ns.nl), or call 0900-9292. Alternatively, take a taxi.

#### By car:

##### From Utrecht or Arnhem:

From the A12 motorway take the 'Ede, Bennekom, Wageningen' exit.  
 Follow signposts to Wageningen.  
 Once you enter Wageningen follow the Wageningen UR signs for the building number.

##### From Nijmegen:

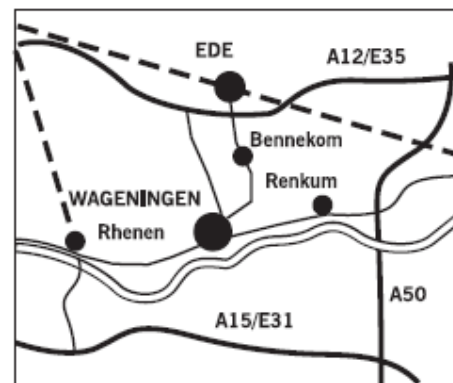
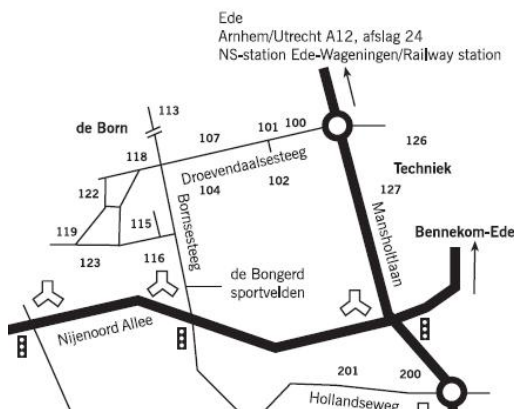
From the A50 motorway take the 'Renkum, Oosterbeek, Wageningen' exit.  
 Follow signposts to Wageningen.  
 Once you enter Wageningen follow the Wageningen UR signs for the building number.

##### From Tiel:

From the A15 motorway take the 'Rhenen' exit.  
 Follow signposts to Wageningen.  
 Once you enter Wageningen follow the Wageningen UR signs for the building number.

### Building number

All buildings of Wageningen UR have a unique building number. Signs along the main roads in Wageningen show where clusters of buildings are located (for example, building numbers 100-200). Within the various clusters, routes to individual buildings are shown.



## FAQ

### **Where can I see what marks I have?**

You can see your marks in the Blackboard environment of the specific module. The official marks are sent to the student administration of the UU, and will be accessible via Osiris. Please check these marks on Osiris, UU.

### **Why do I have two email-addresses?**

Both the UU and the UT-ITC provide you with an email account. You get the UU account because you are formally a student of UU, but you get the UT-ITC account because you need it e.g. to get access to the Blackboard environment. You can use them both, but the UTwente email address will be the one that is used by tuition staff for communication.

### **The (interim) exams are next week and I don't have time to study for them!**

There is a possibility for you to make a re-examination during the next contact days. It is however not advisable as this will require a lot more time the next contact days: you'll have to study for both your re-examination and the other exams you have.

### **I started GIMA full-time, but now I notice it takes a lot more time than I expected. I would like to switch to part-time.**

#### **How do I arrange that?**

To make it official at the UU, use <http://qdesk.uu.nl> to find the correct form. Furthermore, you will have to report it to the module coordinator of the module you are not going to follow; possibly you'll have to arrange something for your project group.

### **I would like to stop with GIMA and receive proof of my finished modules. How do I arrange that?**

See the special section 'Completion of the GIMA programme' in this course catalogue.

### **I would like to have access to a certain module via Blackboard**

Please send an email to [gima@geo.uu.nl](mailto:gima@geo.uu.nl) and your request will be processed.

### **I would like to have the documents that I left in the group folder of a module last year.**

That's tricky. Not all modules are kept online for eternity. The best thing to do is save relevant documents on your own computer when ending a module.

### **I would like to ask for exemption of the GIMA internship. What do I have to do?**

Have a look at the GIMA work placement regulations (in the course catalogue). There are the conditions needed to substantiate your request. Sent the documents plus accompanying letter to the chairman of the Examination Committee.

### **Where can I reach the chairman of the Examination Committee?**

The chairman of the Examination Committee can be found in the section General Information, under GIMA management. Contact details of all staff members are provided in the Staff Information section of this course catalogue.

### **Can I email my fellow students? I have built a nice web mapping service (e.g.) and would like to show my work.**

That is possible through the GIMA general information Blackboard module, choose communication, send email, etc.

### **How do I change my address after moving?**

You can do that via <http://www.studielink.nl>. Also, it will be appreciated if you send an email to [gima@geo.uu.nl](mailto:gima@geo.uu.nl).

### **I am a foreign student – how do I get myself to the venues?**

A separate guidebook is available on how to get around in the Netherlands. You can find it on our website <http://www.msc-gima.nl>, Blackboard or e-mail [gima@geo.uu.nl](mailto:gima@geo.uu.nl).



## **Part II: GIMA regulations**

## **Teaching and Examination Regulations 2013-2014**

for the Masters degree programmes in

- Earth Sciences
- Environmental Sciences
- Human Geography and Planning
- Science and Innovation Management
- Development Studies
- Planning
- Human Geography
- Geographical Sciences

**Graduate School of Geosciences  
Utrecht University**





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**The Teaching and Examination Regulations set out the degree programme-specific rights and obligations of students on the one hand and of Utrecht University on the other. The University's student statute sets forth the rights and obligations that apply to all students.**

**These regulations were adopted by the dean of the Faculty of Geosciences on 10 July 2013 with the approval of the Faculty Council on 23 April 2013.**

## **SECTION 1 – GENERAL PROVISIONS**

### **Art. 1.1 – applicability of the regulations**

These regulations apply to the teaching and examinations of the Master's degree programmes in Development Studies, Earth Sciences, Environmental Sciences, Geographical Sciences, Human Geography, Human Geography and Planning (research), Planning, Science and Innovation Management (hereinafter called the degree programmes) and to all students enrolled on these degree programmes for the academic year 2013-2014. The degree programmes are run by the Graduate School of Geosciences within the Faculty of Geosciences.

### **Art. 1.2 – definition of terms**

In these regulations, the following terms have the following meanings:

- a. the Act: the Higher Education and Research Act.
- b. student: anyone who is enrolled at the University to take courses and/or sit partial exams and final exams of the programme.
- c. credit point: a value expressed in ECTS, where each credit point is approximately equivalent to 28 hours of learning.
- d. degree programmes: the Master's degree programmes mentioned in Art. 1.1 of these regulations. A degree programme may comprise several Master's programmes.
- e. component: a unit of study (course) within the degree programme, as included in the Course Catalogue and the University's Course Catalogue.
- f. course: a unit of teaching and assessment.
- g. test: partial examination as meant by Art. 7.10 of the Act.
- h. exam: the final exam of the degree programme, which is completed successfully if all the degree requirements have been met.
- i. special needs contract: the contract entered into by the Director of Teaching (or other representative of the degree programme) and the disabled student specifying the necessary and reasonable facilities which the student is entitled to.
- j. International Diploma Supplement: the document attached to the degree certificate that explains the nature and content of the qualification (in an internationally understandable form).
- k. Board of Studies: the Board of the Graduate school of Geosciences.
- l. Student Information Desk of Geosciences: student information desk and student progress administration unit of the Faculty.
- m. course guide: document specifying for each course: the learning outcomes; the requirements (such as the attendance and effort requirements) that a student must meet to complete the learning outcomes; the way in which the final mark is calculated; the timetable and the instructional formats; name and availability of the course coordinator.
- n. summer vacation period: the period between the end of semester 2 and the start of semester 1 of the following year; it follows the University academic calendar.

The other terms have the meanings ascribed to them in the Act.

## SECTION 2 – ADMISSION

### Art. 2.1 – degree programme admission requirements

1. The holder of a Dutch or foreign higher education degree who demonstrates knowledge, understanding and skills in sub-areas of Geosciences can be admitted to one of the Master's degree programmes mentioned in Article 1.1.
2.
  - a. The holder of a Bachelor's degree with a Utrecht University major in Earth Sciences is assumed to have gained the knowledge, understanding and skills referred to in the first paragraph, and is for that reason admitted to the Master's degree programme in Earth Sciences.
  - b. The holder of a Bachelor's degree with a Utrecht University major in Environmental Sciences or a Bachelor's degree with a Utrecht University major in Environmental Studies is assumed to have gained the knowledge, understanding and skills referred to in the first paragraph, and is for that reason admitted to the Master's degree programme in Environmental Sciences.
  - c. The holder of a Bachelor's degree with a Utrecht University major in Science and Innovation Management is assumed to have gained the knowledge, understanding and skills referred to in the first paragraph, and is for that reason admitted to the Master's degree programme in Science and Innovation Management.
  - d. The holder of a Bachelor's degree with a Utrecht University major in Human Geography and Planning is assumed to have gained the knowledge, understanding, and skills referred to in the first paragraph, and is for that reason admitted to the Master's degree programme Development Studies, Geographical Sciences, Human Geography, or Planning.
3. Admissions decisions are made by the Board of Admissions, taking account of the applicant's preferred programme within the Master's degree programme and of the text of Art 2.4.
4. The applicant must master spoken and written English.

### Art. 2.2 – English language

1. Prior to undertaking the degree programme (taught in English), students must demonstrate proficiency in English by passing one of the following tests:
  - o IELTS (International English Language Testing System), academic module. The minimum IELTS score required is an Overall Band Score of 6.5 and no less than 6.0 in the writing section.
  - o TOEFL (Test of English as a Foreign Language). The minimum required TOEFL score is 93 (internet-based).
  - o Cambridge EFL (English as a Foreign Language) Examinations, presenting one of the following certificates:
    - Cambridge Certificate in Advanced English; minimum score B.
    - Cambridge Certificate of Proficiency in English; minimum score C.
2. The holder of a Bachelor's degree gained at a university in the Netherlands meets the English language requirement for admission.

### Art. 2.3 – proficiency in Dutch for holders of foreign qualifications (in relation to the Dutch-taught Master's Degree Programmes)

Holders of foreign qualifications may only register:

1. if they demonstrate required proficiency in Dutch by passing the state examination in Dutch as a Second Language, Programme 2, or by obtaining the certificate in Dutch as a Second Language, 'Academic Language Skills Profile' (PAT) or 'Higher Education Language Skills Profile' (PTHO), and
2. if they demonstrate required proficiency in English by passing one of the following tests:
  - o IELTS (International English Language Testing System), academic module. The minimum IELTS score required is an Overall Band Score of 6.5 and no less than 6.0 in the writing section.

- o TOEFL (Test of English as a Foreign Language). The minimum required TOEFL score is 93 (internet-based).
- o Cambridge EFL (English as a Foreign Language) Examinations, presenting one of the following certificates:
  - Cambridge Certificate in Advanced English; minimum score B.
  - Cambridge Certificate of Proficiency in English; minimum score C.

#### Art. 2.4 – Admission to the Master’s programmes

1. The different Master’s programmes within the degree programme in Earth Sciences have the following specific admission requirements in addition to those listed in Art. 2.1:
  - Direct admission to the Master’s programme *Earth Surface and Water*, track Coastal Dynamics and Fluvial Systems is given to applicants who successfully complete the following Utrecht Bachelor courses: either Morphodynamics of tidal system **or** River Morphodynamics and also either Fluid Mechanics I **or** Quaternary climate and global change.
  - Direct admission to the Master’s programme *Earth Surface and Water*, track Geohazards and Earth Observation is given to applicants who successfully complete the following Utrecht Bachelor courses: Soil and water contamination, Land degradation, Geodynamics and Earth observation & data analysis.
  - Direct admission to the Master’s programme *Earth Surface and Water*, track Hydrology is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Water in Geo processes, Soil and water contamination, Environmental modeling, Fluid mechanics 1 and Programming & modelling of earth processes.
  - Direct admission to the Master’s programme *Earth Surface and Water*, track Environmental geochemistry is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Geochemical processes at the Earth’s surface, Paleoceanography and Soil and water contamination.
  - Direct admission to the Master’s programme *Earth, Life and Climate*, track Environmental geochemistry is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Geochemical processes at the Earth’s surface, Paleoceanography and Soil and water contamination.
  - Direct admission to the Master’s programme *Earth, Life and Climate*, track Biogeosciences and evolution is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Sedimentation, fauna and climate, Paleoceanography and Evolution & ecology.
  - Direct admission to the Master’s programme *Earth, Life and Climate*, track Climate reconstruction is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Sedimentation, fauna and climate, Paleoceanography, Paleoclimatology – paleoecology and Quaternary climate and global change.
  - Direct admission to the Master’s programme *Earth, Life and Climate*, track Integrated stratigraphy and sedimentary system is given to applicants who successfully complete at least two of the following Utrecht Bachelor courses: Sedimentation, fauna and climate, Paleoceanography, Paleoclimatology – paleoecology and Quaternary climate and global change.
  - Direct admission to the Master’s programme *Earth Structure and Dynamics*, track Physics of the deep Earth and planets is given to applicants who successfully complete the following Utrecht Bachelor courses: Geodynamics, Introduction to seismology and seismics, Programming and modelling of earth processes, LAVA and DIVA. (N.B.: at least one of these completed courses is on level 3)
  - Direct admission to the Master’s programme *Earth Structure and Dynamics*, track Basins, Orogens and the crust lithosphere systems is given to applicants who successfully complete at least two of the following UU courses: Geodynamics, Continuum mechanics and rheology, Programming and modelling of earth processes, Lithosphere dynamics and Sedimentary systems. (N.B.: at least one of these completed courses is on level 3)
  - Direct admission to the Master’s programme *Earth Structure and Dynamics*, track Earth Materials is given to applicants who successfully complete at least two of the

following Utrecht Bachelor courses: Continuum mechanics and rheology, Structure and properties of earth materials, Chemical geodynamics and Structural geology and tectonics.

2. The different Master's programmes within the degree programme in Environmental Sciences have specific admission requirements in addition to those listed in Art. 2.1:
  - Applicants holding a Bachelor's degree with a Utrecht University major in Environmental Sciences have guaranteed admission to the Master's programme in Sustainable Development, track Energy & Resources, track Global Change and Ecosystems and track Environmental Governance.
  - Applicants holding a Bachelor's degree with a Utrecht University major in Environmental Studies have guaranteed admission to the Master's programme in Sustainable Development, track Environmental Governance.
  - Applicants holding a Bachelor's degree with a Utrecht University major in Environmental Studies or Environmental Sciences and a Utrecht University minor Development Studies have guaranteed admission to the Master's programme in Sustainable Development, track International Development.
3. The Master's programme in Human Geography and Planning (Research Master's) has the following specific admission requirements in addition to those listed in Art. 2.1:
  - High positive motivation and dedication to undertake the Master's programme.
  - Good academic results in their previous studies. Applicants must be able to demonstrate that they belong to the top 10 percent of their programme.
  - The applicant must have completed previous studies with a grade point average of at least 3.0 (on a scale of 1-4) or of at least 7.0 under the Dutch system.
4. The Master's programme in Development Studies has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Knowledge and understanding of the concepts and theories of Human Geography, and knowledge at an advanced level in at least the issues of developing and transition countries;
  - Knowledge and understanding of the methods and techniques of socio-spatial research and some experience in carrying out such research;
  - Academic skills on a par with those expected at the level of a university Bachelor's degree.
5. The Master's programme in Human Geography has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Knowledge and understanding of the concepts and theories of Human Geography, and at least one of the fields of specialization in Human Geography;
  - Knowledge and understanding of the methods and techniques of socio-spatial research and some experience in carrying out such research;
  - Academic skills on a par with those expected at the level of a university Bachelor's degree.
6. The Master's programme in Planning has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Knowledge and understanding of the concepts of Planning and Human Geography, planning theory and methods, and at least one of the fields of specialization in planning;
  - Knowledge and understanding of the methods and techniques of socio-spatial research and some experience in carrying out such research;
  - Academic skills on a par with those expected at the level of a university Bachelor's degree.
7. The Master's programme Geographical Sciences has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Knowledge and understanding of the concepts of geo-information;
  - Academic skills on a par with those expected at the level of a university Bachelor's degree.
8. The Master's programme Energy Science has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Basic knowledge of Thermodynamics, Energy Analysis and Mathematics
  - Basic knowledge of contemporary energy and environmental related issues
9. The Master's programme Sustainable Business and Innovation has the following specific admission requirements in addition to those listed in Art. 2.1:
  - Knowledge and understanding of the concepts of natural sciences.

#### **Art. 2.5 - deficiencies**

The Board of Admissions of the Graduate School may require those applicants who do not meet

the admission requirements referred to in Art. 2.1 and Art 2.4 to complete a package of courses to a maximum of 60 ECTS, to be taught by Utrecht University and tailored to the Master's programme concerned, in order to remove background deficiencies.

### **Art. 2.6 – admissions procedures**

1. Responsibility for admission to the degree programmes of the Graduate School and the different Master's programmes lies with the Board of Admissions of the Graduate School.
2. With an eye to admission to the degree programme, the Board of Admissions will review the knowledge, understanding and skills of the applicant. In addition to documentary evidence of programmes completed, the Board may have specific knowledge, understanding and skills assessed by experts inside or outside the University.
3. With an eye to admission to a Master's programme within the degree programme, the Board of Admissions will conduct an admissions review to determine if the applicant meets, or will meet in a timely manner, the requirements for admission referred to in Art. 2.4. In its review, the Board will include the applicant's motivation and ambition for the programme concerned as well as the applicant's knowledge of the programme's language of instruction.
4. Admissions reviews are conducted twice a year.
5. Requests for admission to the degree programme and to a specific Master's programme are submitted to the Board of Admissions before 1 March and 1 September. In special cases, the Board of Admissions may consider requests submitted after the deadline dates.
6. The Board of Admissions will make an admissions decision within the time frames set by the Board of Studies. Admission will be granted on the condition that the applicant meets the knowledge and skills requirements referred to in Art. 2.4 by the start date of the degree programme, as evidenced by certificates of programme completion.
7. The applicant will receive written notification of acceptance or non-acceptance into the degree programme and a specific Master's programme. The decision letter will call attention to the possibility of appeal to the Examinations Appeal Board.

### **Art. 2.7 – admission for a six-month period**

1. In special cases, the Board of Admissions may, at the request of an applicant who is preparing for the final exam of one of the Bachelor's degree programmes referred to in Art. 2.1, paragraph 2, admit the applicant to the degree programme for a six-month period if:
  - the applicant has successfully completed the required components of the major programme and only has to complete components of the Bachelor's degree programme with a total credit value of no more than 15, and if
  - the applicant can be reasonably expected to complete the Bachelor's degree programme in a very short period, but not later than six months from the time he or she is conditionally admitted to the Master's degree programme, and if
  - the applicant, due to circumstances beyond his or her control, has not been able to make satisfactory academic progress and would disproportionately fall behind in studies if they were unable to begin the Master's degree programme at the scheduled start date.
2. After completing the final exam of one of the Bachelor's degree programmes referred to in Article 2.1, paragraph 2, the six-month admission period will be converted to regular admission.
3. If the student does not successfully complete the final exam of one of the Bachelor's degree programmes referred to in Art. 2.1, paragraph 2, within six months of starting the Master's degree programme, he or she will be excluded from the Master's degree programme until the Bachelor's exam has been passed.

### **Art. 2.8 – limited entry**

1. The Board of Studies will determine the maximum number of students to be admitted to the degree programmes and the different Master's programmes.
2. The Board of Admissions will rank the submitted requests according to knowledge and skills of the applicants.
3. The Board of Admissions will grant the requests based on the rankings established.

## SECTION 3 – CONTENT AND STRUCTURE OF THE DEGREE PROGRAMMES

### Art. 3.1 – aims of the degree programmes

1. The degree programmes aim to:
  - o equip students with specialised knowledge, skills and understanding in the field of Geosciences, and to help them achieve the learning outcomes referred to in paragraph 2;
  - o prepare students for a career in one or more sub-fields of Geosciences;
  - o prepare students for undertaking a programme to train as a researcher in the field of Geosciences.
  
2. The graduate:
  - o has a deep knowledge and understanding of the subject matter of Geosciences;
  - o has a thorough knowledge of a specialism in their degree programme, or a thorough knowledge at the interface of the degree programme and another subject area;
  - o has the skill to independently identify, formulate, and analyse problems in the field of Geosciences, and to propose possible solutions;
  - o has the skills to conduct research in the field of Geosciences and to report on this research in a manner that meets the standards usual for the discipline;
  - o possesses professional and academic skills, in particular in relation to research in the field of Geosciences;
  - o is able to apply knowledge and understanding in such a way that he or she demonstrates a professional approach to their work;
  - o is able to communicate conclusions, as well as the knowledge, reasons and considerations underlying these conclusions, to an audience of specialists or non-specialists.

The course catalogues for the Master's programmes set out the subject-specific learning outcomes for the different Master's programmes.

### Art. 3.2 – study mode

The degree programmes Development Studies, Earth Sciences, Environmental Sciences, Human Geography and Planning (research), Science and Innovation Management are offered full-time. The degree programmes in Planning, Geographical Sciences and Human Geography are offered full-time as well as part-time.

### Art. 3.3 – language of instruction

The degree programmes Development Studies, Earth Sciences, Environmental Sciences, Geographical , Human Geography and Planning (research) and Science and Innovation Management are taught in English. The degree programmes in Planning and Human Geography are taught in Dutch. The Master's programme Urban Geography within the degree programme Human Geography is taught in English.

### Art. 3.4 – credit value

The degree programmes Earth Sciences, Environmental Sciences, Geographical Sciences, Human Geography and Planning (research) and Science and Innovation Management have a total credit value of 120. The degree programmes in Development Studies, Planning, and Human Geography have a total credit value of 60.



### Art. 3.5 – Master’s programmes; entry points

1. The Graduate School of Geosciences offers the following Master’s degree programmes and Master’s programmes:

Master’s degree programme	Master’s Programme
Earth Sciences	Earth, Life and Climate Earth Structure and Dynamics Earth Surface and Water Water Science and Management
Environmental Sciences	Sustainable Development Water Science and Management
Geographical Sciences	Geographical Information and Management Applications
Human Geography and Planning	Human Geography and Planning
Science and Innovation Management	Science and Innovation Management Energy Science Sustainable Business and Innovation
Development Studies	International Development Studies
Planning	Planologie
Human Geography	Economische Geografie Geo-communicatie Urban Geography/Stadsgeografie

The Master’s programmes prepare students for undertaking research in one or more sub-fields of Geosciences.

2. The Master’s programmes Earth Sciences, Environmental Sciences and Science and Innovation Management start twice a year: 1 September and 1 February. The Master’s programmes Development Studies, Geographical Sciences, Human Geography and Planning (Research Master), Planning, and Human Geography have one start date a year: 1 September.

### Art. 3.6 – components of the Master’s programmes

1. The core components of the different Master’s programmes and their credit loads are described in Annex 1.
2. Upon approval of the Board of Examiners, the student will choose one or more components. The credit values for the elective components of the specific Master’s programmes are set out in Annex 1.
3. In departure from Art 3.6.2, if a student who has been accepted into one of the programmes has deficiencies, he or she may be required to use (part of) the free-choice component of the programme to remove the deficiencies.
4. The Course Catalogue for the Master’s programmes provides more detailed information about the content and structure of the components of each programme, including any prior knowledge that would help students successfully complete the component concerned.

### Art. 3.7 – components taken elsewhere

1. In order to pass the Master’s degree exam the student must complete at least half of the Master’s programme through components offered by Utrecht University.
2. Components taken elsewhere as part of the programme of study may only be counted towards the student’s degree requirements with prior approval of the Board of Examiners.
3. Components completed at a higher education institution prior to the start of the Master’s degree programme may only qualify for exemption pursuant to Art. 5.13.

## SECTION 4 – COURSES

### Art. 4.1 – course

All courses that may be part of the degree programmes have been included in the course catalogues for the programmes and can be found at the website of the Student Information Desk of Geosciences: <http://studenten.geo.uu.nl>.

### Art. 4.2 – course admission requirements

The Board of Studies will decide the order in which the required components of a Master's programme must be completed. This will be announced in the Course Catalogue.

### Art. 4.3 – course enrolment

A student may only take part in a course if he or she has enrolled for the course in a timely manner. The Board of Studies will decide how and when enrolment takes place. Enrolment rules and enrolment deadlines will be published through the website of the Student Information Desk of Geosciences: <http://studenten.geo.uu.nl>.

### Art. 4.4 – attendance and effort requirements

1. Every student is expected to actively participate in the course on which he or she is enrolled.
2. In addition to the general requirement of active participation in class, any additional requirements per unit are listed in the University's Course Catalogue and the Course Guide.
3. A student may be granted exemption from attendance if he or she is incapacitated (for instance as a result of illness or family circumstances). Any leave or absence must be agreed with the Programme Office in advance by phone. The course coordinator or the director of education can request the student to provide written information that proves the special situation.
4. If participation is inadequate, qualitatively or quantitatively, the course coordinator may decide to exclude the student from the remainder or any part of the remainder of the course.

## SECTION 5 – ASSESSMENT

### Art. 5.1 – general

1. During the course the student will be assessed on academic skills and on the extent to which he or she has achieved the stated learning outcomes. All assessment activities will be completed by the end of the course.
2. The Course Guide and/or the University's Course Catalogue detail the achievements the student must demonstrate for him or her to successfully complete the course, as well as the criteria on which the student is assessed.
3. The published (see: Course Catalogue/Website) rules and regulations of the Board of Examiners outline the assessment process.
4. If a course has to be repeated, the last acquired judgement counts. Should a student pass for a course, but still wishes to repeat the course, the complete course should be repeated.

### Art. 5.2 – Board of Examiners

1. The Dean will establish a Board of Examiners for each study programme or group of programmes and will ensure the Board of Examiners can operate independently and professionally.
2. The Dean will appoint the chair and members of the Board for a three-year term, based on their expertise in the relevant study programme(s) or in examinations. Reappointment is

possible. The Dean will consult the relevant members of the Board of Examiners before an appointment is made.

3. Persons holding management positions that include financial responsibilities or who are wholly or partially responsible for course programmes are not eligible for appointment to the Board of Examiners. These persons will in any event include the Dean, the Vice Dean, directors/heads/managers of a department, members of a department's management/governing team, members or chairs of the Board of Studies of the Graduate or Undergraduate School and the Education Director.
4. Membership of the Board of Examiners will end on completion of their term of appointment. The chair and members of the Board may also be dismissed at their own request. The chair and members of the Board will be dismissed by the Dean if they no longer meet the requirements of paragraphs 2 or 3 of this section. The Dean may also dismiss a chair or members found to be performing their statutory duties unsatisfactorily.
5. The Dean will announce the composition of the Board of Examiners to students and lecturers.

#### **Art. 5.3 – assessment of placement or research assignment**

1. The student's performance during a placement or his or her research assignment will be assessed by the supervisor in question and by one or more other internal and/or external experts.
2. Master's theses will be assessed by two lecturers.

#### **Art. 5.4 – grades**

1. Grades will be awarded on a scale from 1 to 10. The final course grade will be satisfactory or unsatisfactory, or, if expressed in numbers, 6 or higher and 5 or lower respectively.
2. The final course grade will be rounded to one decimal place. A grade for a partial test will not be rounded.
3. The final course grade of 5 and lower will not have any decimal places. An average grade of 4.95 to 5.49 is unsatisfactory (5); an average grade of 5.50 to 5.99 is satisfactory (6)
4. The Course Guide sets out the way in which the final course grade is calculated.

#### **Art. 5.5– repeat exams: supplementary or replacement tests**

1. If during the course the student satisfies all the effort requirements and does not receive a satisfactory grade but does receive a final grade of at least 5.00 before rounding, he or she will be given one opportunity to take a supplementary test.
2. The teacher will determine the form and content of the supplementary test.
3. If the student passes the supplementary test, a final course grade of 6 will be recorded in the student progress administration system. Partial results that the student has achieved will not be taken into account in establishing the final grade of the supplementary test.
4. If the student does not pass the supplementary test, the initial final grade will be entered into the student progress administration system, thus rendering all partial course grades defunct.
5. Students who miss a test or part of a test owing to circumstances demonstrably beyond their control will be given one opportunity to sit an alternative test. Only students immediately reporting these circumstances beyond their control to the study programme's secretariat will be eligible to sit an alternative test.
6. The teacher will determine the form and the content of the replacement test.
7. The result of the replacement test is taken into account in establishing the final grade of the entire course, except as provided in subsection 8.
8. If the grade for the replacement test replaces all exams in the course, the result of the replacement test will be recorded in the student progress administration system; it replaces the initial final grade.

#### **Art. 5.6 – assessment mode**

1. Assessment as part of a course will take place as stated in the course guide for the course.

2. Upon request, the Board of Examiners may give permission for a test to be administered in a manner which departs from the provisions of the first paragraph.

#### **Art. 5.7 – oral tests**

1. Only one person at a time may be tested, unless the Board of Examiners decides otherwise.
2. Oral tests will be administered in public, unless the Board of Examiners or the examiner concerned decides otherwise in exceptional circumstances, or unless the student objects.

#### **Art. 5.8 – assessment provision for special circumstances**

1. If not providing special assessment arrangements was to lead to a 'compelling case of unreasonableness', the Board of Examiners may decide to grant special assessment arrangements.
2. Requests for special assessment arrangements must be submitted as early as possible together with supporting documentary evidence. They must be submitted to the Board of Examiners through the student adviser.

#### **Art. 5.9 – assessment turnaround time**

1. Within 24 hours of administering an oral test the examiner will determine the grade and provide the student with a statement of the grade received.
2. The examiner will grade a written or differently administered test within 10 working days of the test date, and will supply the administrative office of the Faculty the information necessary for providing the student with the written or electronic proof of the grade received.
3. Time frames for assessment do not apply during the summer vacation period.
4. The written statement of the grade received includes a reference to the right of inspection, as addressed in Art. 5.11, as well as to the possibilities of appeal to the Examinations Appeals Board.

#### **Art. 5.10 – validity period**

1. Successfully completed components of one-year degree programmes have an unlimited validity.  
Notwithstanding this, the Board of Examiners can impose a supplementary or replacement test for a component of which the assessment has been more than three years ago (master's degree programmes of one year) or six years ago (master's degree programmes of two years).
2. Partial tests and assignments passed in a component that was not successfully completed will expire at the end of the academic year in which they were passed. Partial tests and assignments expire at the end of the period in which they were passed, if the concerning course is taught more than once per academic year.

#### **Art. 5.11 – right of inspection**

1. Within 30 days after the announcement of the result of a written test, the student is allowed to inspect his or her graded work upon request. Upon request, a copy of that work will be supplied to the student at cost.
2. During the period referred to in the first paragraph, any stakeholder may inspect the questions and tasks of the test in question, as well as, if possible, the standards on which the grade is based.

#### **Art. 5.12 – retention of assessments**

1. The assessment tasks, answers and the assessed work will be retained for a period of two years after the assessment date.
2. The thesis and its assessment will be retained for a period of seven years after the assessment date.

### Art. 5.13 – exemption

At the student's request, the Board of Examiners, after hearing the examiner concerned, may grant the student exemption from a programme component if he or she:

- a. prior to starting the Master's programme has either completed a higher education programme component which is equivalent in content and level; or
- b. has demonstrated through work or professional experience that he or she has sufficient knowledge and skills in relation to that component.

### Art. 5.14 – fraud and plagiarism

1. Fraud and plagiarism mean any action or non-action of a student that wholly or partly prevents an accurate assessment of his or her knowledge, understanding and skills.

Fraud includes:

- copying during an examination. Any persons enabling copying will be deemed accessory to fraud;
- being in the possession of appliances during the examination (such as pre-programmed calculators, mobile telephones, books, syllabuses, notes and so on), unless the use of such appliance is explicitly permitted;
- allowing other persons to complete all or part of an assignment;
- obtaining the relevant examination questions or assignments before the date or time of the examination will be held;
- making up the answers to questionnaires, interviews or research data;

Plagiarism is defined as including data or texts written by other persons in one's thesis, without acknowledging the source. Plagiarism includes in any event:

- copying and pasting text from digital sources such as encyclopaedias or digital journals without quotation marks and references;
- copying and pasting text from the internet without quotation marks and references;
- copying printed matter such as books, journals or encyclopaedias without quotation marks and references;
- including a translation of such source texts as mentioned above without quotation marks and references;
- paraphrasing such source texts as mentioned above without due referencing; paraphrasing should be marked as such (by explicitly linking the paraphrased text to the original author in the text or in a note) so as to avoid the impression that these are the student's own ideas;
- copying others' visual, audio or test material without due reference and thus allowing it to be regarded as one's own work;
- submitting one's own work written for a previous course as if written originally for the new course, unless explicitly allowed by the teacher of the course.
- copying the work of other students and allowing it to be regarded as one's own work. If this happens with the permission of another student, the latter will be accessory to plagiarism;
- if one of the authors of a joint assignment commits plagiarism, the other authors will be accessory to plagiarism if they should or could have known that the former committed plagiarism;

submitting assignments acquired from a commercial organisation (such as a website providing abstracts or papers) or written by someone else in return for remuneration.

2. a. If fraud is discovered or suspected, the examiner will so inform the Board of Examiners in writing.
- b. If the examiner detects or suspects plagiarism:
  - he or she will so inform the student in writing;
  - he or she will give the student the opportunity to respond to this in writing;
  - he or she will subsequently send the written documents and findings to the Board of Examiners.

- c. The Board of Examiners will provide the opportunity for the examinee to be heard.
3. The Board of Examiners will determine if fraud or plagiarism has occurred and will inform, in writing, the examinee of its decision and any sanctions pursuant to provision 4 of Art. 5.14, also mentioning the possibility of appeal to the Examinations Appeals Board.
4. The Board of Examiners will punish fraud and plagiarism as follows:
  - a. In any case:
    - o the submitted assignment or partial exam will be declared invalid.
    - o the student will be given a reprimand, which will be noted in OSIRIS.
  - b. And furthermore, depending on the nature and size of the fraud or plagiarism, and on the stage of the programme the student has reached, one or more of the following sanctions:
    - o the student will be removed from the course.
    - o the student will no longer qualify for a cum laude designation as referred to in Art.6.2.
    - o the student will be disqualified from partial exams or other forms of assessment that are part of the course in question for the then current academic year or for a 12-month period.
    - o the student will be disqualified from all partial exams and other forms of assessment for a period of 12 months.
  - c. If a student has been reprimanded before:
    - o he or she will be disqualified from all partial exams or other forms of assessment for a 12-month period and advised to leave the Master's programme.
  - d. In case of extremely serious and/or repeated fraud, the Board of Examiners may recommend that the Executive Board permanently terminate the registration for the programme of the student concerned.

### **Art. 5.15 – right of appeal**

The student has a right to appeal decisions taken by the Board of Examiners or by examiners. The appeal must be made in writing, and explaining the basis for the appeal, to the Examinations Appeals Board within six weeks of taking the test or examination, or of the decision being made, pursuant to Article 7.61 WHW 1992.

## **SECTION 6 – EXAMINATION**

### **Art. 6.1 – examination**

1. At the moment a student meets the requirements of the examination programme, the Board of Examiners determines the result of the examination and grants the certificate to the student, as described in Article 6.4.
2. Prior to determining the examination result, the Board of Examiners may examine the student's knowledge of one or more components or aspects of the programme of study, if and in so far as the results of the tests concerned give them reason to do so.
3. Review of the student's assessment file constitutes part of the final examination. The examination date will be the last working day of the month in which the Board of Examiners has determined that all components have been successfully completed.
4. Conditions to pass the examination are
  - All components are passed with a sufficient result
  - The composition of the course package meets the determined level requirements
5. A further condition for passing the examination and receiving the certificate is that the student was registered for the programme during the period in which the tests were taken. If the student does not fulfil this condition, the Executive Board may issue a statement of no objection in relation to the passing of the examination and the issue of the certificate, after the student has paid tuition fees and administration charges owing for the 'missing' periods.
6. One who has passed the examination and is entitled for a certificate, may request the Board of Examiners to not yet grant the certificate. This request has to be submitted within two weeks after the student has been informed about the result of the examination. The student will indicate in this request when he or she does want to receive the certificate. The Board of Examiners will grant the request in 2013-2014 when the student:

- is going to perform board activities for which the Utrecht University grants compensation
- is going to do an internship or component abroad

The Board of Examiners may also grant such request if failure to grant the request will result in substantial unfairness because the person involved could not have taken the graduating automatically into account in his/her individual study planning.

7. After the student has passed the final examination he/she can request the institution to terminate his/her registration.

### **Art. 6.2 – cum laude designation**

1. If a student has demonstrated outstanding academic achievement in his or her Master's programme, the degree will be awarded cum laude; this designation will be noted on the degree certificate.
2. The cum laude designation will be awarded if
  1. the weighted average of the grades earned for the Master's programme components is at least 8.
  2. the student has received a minimum grade of 8 for the Master's thesis.
  3. the student has received exemptions for no more than 7,5 credit points (1-year programmes) or no more than 15 credit points (2-year programmes).
  4. there has not been any Board of Examiners decision (as meant by Art. 5.14, paragraph 4 under b) that fraud/plagiarism has been committed.
  5. all grades have been earned within one and a half year (one-year degree programmes) or three years (two-year degree programme) of beginning the degree programme.
3. The Board of Examiners may decide to award the cum laude designation even if not all the requirements mentioned in paragraph 2 are met. Such a decision must be unanimous.
4. Designations other than cum laude will not be noted on the degree certificate.

### **Art. 6.3 – degree**

1. The candidate who has successfully completed the exam will be awarded the degree of Master of Science.
2. The awarded degree will be noted on the exam certificate.

### **Art. 6.4 – degree certificate**

1. As evidence of successful completion of the exam, the Board of Examiners will issue a degree certificate.
2. The Board of Examiners will append to the degree certificate the International Diploma Supplement, which, for the sake of international transparency, gives information about the nature and content of the programme of study.

### **Art. 6.5 - Grade Point Average (GPA)**

1. The final Grade Point Average (GPA) is stated on the International Diploma Supplement, and represents the academic performance of the student concerned).
2. The final GPA is the average figure from the results achieved within the course's examinations programme, weighted by the course credits and expressed on a scale of 1 to 4 with two decimals.
3. The final GPA is calculated as follows:
  - all applicable examinations achieved as part of the examination programme of the master's degree, are converted to quality points;
  - quality points are the applicable examination result x the number of course credits (ECTS) for the section in question;
  - the total number of quality points achieved divided by the total number of course credits (ECTS) obtained, results in the average examination result;
  - the average examination result is converted into the final GPA.

## SECTION 7 – STUDENT SUPPORT AND GUIDANCE

### Art. 7.1 – student progress administration

1. The Faculty records each student's individual grades and makes these available through Osiris-student.
2. Certified student progress files may be obtained from the Student Information Desk of Geosciences.

### Art. 7.2 – student support and guidance

1. The Faculty is responsible for providing student support and guidance to students enrolled on the degree programmes.
2. Student support and guidance consists of:
  - allocation of a tutor and/or student adviser
  - an orientation / induction programme in the first week of the first year of study
  - providing referral and support for students experiencing difficulties during their studies.

### Art. 7.3 – disabilities

Students with special needs are afforded the opportunity to take classes and sit tests in the manner agreed in their Special Needs Contracts. Requests for special needs contracts are submitted to the student adviser.

## SECTION 8 – TRANSITIONAL AND FINAL PROVISIONS

### Art. 8.1 – safety net arrangements

If a circumstance arises for which the regulations do not provide, do not clearly provide or seem to have unreasonable effects or lead to unreasonable results, the matter will be determined by or on behalf of the Dean, after having heard the Board of Examiners.

### Art. 8.2 – cum laude for students who have started before September 1, 2013.

The cum laude designation will be awarded if

1. the weighted average of the grades earned for the Master's programme components is at least 8.
2. the student has received exemptions for no more than 7,5 credit points (1-year programmes) or no more than 15 credit points (2-year programmes).
3. there has not been any Board of Examiners decision (as meant by Art. 5.14, paragraph 4 under b) that fraud/plagiarism has been committed.
4. all grades have been earned within one and a half year (one-year degree programmes) or three years (two-year degree programme) of beginning the degree programme.

### Art 8.3 – amendments

1. Amendments to these regulations will be laid down by the Dean after having heard the Degree Programme Committee and after consultation with the Faculty Council or Degree Programme Council, in separate resolutions.
2. Any amendments to these regulations are not to be applied to the then current academic year, unless it can be assumed that they will not unreasonably harm the interests of the students.



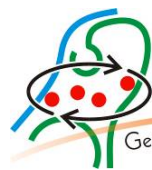
3. Furthermore, with respect to the students an amendment may not adversely affect any other decision taken pursuant to these regulations by the Board of Examiners in relation to a student.

#### **Art. 8.4 – publication**

The Dean is responsible for publishing these regulations, and any amendments to them, via the internet.

#### **Art. 8.5 – effective date**

These regulations take effect on September 1, 2013.



## APPENDIX 1 Structure of master programmes

### Earth Structure and Dynamics

Theoretical courses: required electives	45 EC
Deficiency courses	0-15 EC
MSc research/thesis	30-60 EC
Individual programme/ internship	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0- 45 EC

### Earth, Life and Climate

Theoretical courses: required electives	45 EC
Deficiency courses	0-15 EC
MSc research/thesis	30-60 EC
Individual programme/ internship	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0- 45 EC

### Earth Surface and Water

Theoretical courses: required electives	45 EC
Deficiency courses	0-15 EC
MSc research/thesis	30-60 EC
Individual programme/ internship	up to 30 EC
Additional theoretical courses, seminar modules, advanced-level courses	0- 45 EC

### Economische Geografie

Required / theoretical	22.5 EC
Methods of research	7.5 EC
MSc research/thesis	30 ECTS

### Geo-communicatie

Required / theoretical	30 EC
Individual project/ internship	7.5- 15 EC
MSc research/thesis	15-22.5 EC

### Geographical Information Management and Applications

Required / theoretical	40 EC
Methods of research	20 EC
MSc research/thesis	30 EC



Internship or Individual programme	30 EC
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**Human Geography and Planning**

Required / theoretical	60 EC
Elective	15 EC
MSc research/thesis	45 EC

**International Development Studies**

Required / theoretical	20 EC
Methods of research	10 EC
MSc research/thesis	30 EC

**Planologie**

Required / theoretical	22.5 EC
Methods of research	7.5 EC
MSc research/thesis	30 EC

**Science and Innovation Management**

Required / theoretical	37.5 EC
Methods of research	22.5 EC
MSc research/thesis	45 EC
Elective	15 EC

**Sustainable Development**

Required / theoretical	45 EC
Methods of research	15 EC
MSc research/thesis	30-45 EC
Elective	15-30 EC

**Sustainable Business and Innovation**

Required / theoretical	45 EC
Methods of research	15 EC
Msc thesis/ internship	45 EC
Elective	15 EC

**Urban Geography (Stadsgeografie)**

Required / theoretical	22.5 EC
Methods of research	7.5 EC
MSc research/thesis	30 EC

**Water Science and Management**

Required / theoretical	75 EC
MSc research/thesis (Obligatory external internship format)	30 - 45 EC
Elective / MSc individual programme	0 - 15 EC

**Energy Science**

Required / theoretical	22.5 EC
Methods of research	15 EC
MSc thesis / internship	45 – 60 EC
Elective	22.5 – 37.5 EC



## Regulations of the Board of Examiners

(Rules & Guidelines pursuant to art. 7.12b, paragraph 3 of the Higher Education and Research Act)

Adopted by the Board of Examiners of the Graduate School of Geosciences at Utrecht University, on December 19<sup>th</sup>, 2011. These Regulations take effect on 1 September 2012.

The Board of Examiners of the Graduate School of Geosciences will consist of a Central Board of Examiners and three Executive Chambers. The Executive Chambers will independently implement the examination policy within the framework set by the Central Board of Examiners of the Graduate School of Geosciences. The Central Board of Examiners of the Graduate School of Geosciences will consist of the chairs of the Executive Chambers. The Central Board of Examiners of the Graduate School of Geosciences will set a framework for and supervise examinations. It will determine the examination policy and set frameworks in the form of regulations and procedures. The Central Board of Examiners will annually define the Board of Examiners' regulations. In addition, as part of its supervisory role, it will monitor the quality of the Chambers' decisions and their implementation of the examination policy.

Requests to the Board of Examiners will be submitted centrally and subsequently assigned to the individual Executive Chambers by the Central Board of Examiners.

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### PARAGRAPH 1 – GENERAL STIPULATIONS

#### **art. 1 – scope of application**

These Regulations apply to the interim and final examinations of the study programme(s) Development Studies, Earth Sciences, Environmental Sciences, Geographical Sciences, Human Geography, Human Geography and Planning (research), Planning, Science and Innovation Management and the Master's programme Energy Science. The terms defined in the Education and Examination Regulations of this study programme also apply to these Regulations.

#### **art. 2 – board of examiners**

1. The board of examiners will appoint a member from its ranks who is charged with managing the daily course of affairs of the board of examiners.
2. The board of examiners will take decisions by an ordinary majority of votes. If the votes are equal, the student or his or her request is rejected.
3. The board of examiners must take a decision within six weeks of receipt of an application.
4. Decisions taken by a Board of Examiners will be recorded in minutes. These minutes will be approved, at least by or on behalf of the chair.
5. Each year, the Board of examiners will draw up a report on its work in each academic year and provide this report to the Dean no later than on the 1st December following the academic year in question.
6. The Board of Examiners will be supported in its work by an official secretary. This official secretary will not sit on the Board of Examiners. The official secretary will ensure:
  - a. preparation, convocation and keeping of minutes at the meetings;
  - b. monitoring of the implementation of decisions taken;
  - c. communication of decisions taken to students and other interested parties;
  - d. drawing up regular reports;
  - e. archiving requests processed, objections and decisions taken.

#### **art. 3 - standards**

In its decisions, the Board of Examiners will be guided by the following standards:

- a. the retention of quality criteria in an examination or test;
- b. efficiency requirements, expressed inter alia in efforts to:
  - limit as far as possible loss of time for students, who can thereby make rapid progress which their studies;
  - motivate students to terminate their studies as quickly as possible, if it is unlikely that they will pass an examination or test;
- c. protecting students from themselves in the event that they wish to take on an excessive study load;
- d. leniency in relation to students who, through factors outside their control, have experienced delays in the progress of their studies.

#### **art. 4 - examiners**

1. Members of the academic staff who are charged with teaching a course will be responsible as examiners for the testing of the course. The board of examiners may appoint other members of the academic staff and experts outside the study programme as examiners.
2. The Board of Examiners may withdraw the appointment as an examiner in the event that the examiner fails to comply with the applicable legislation or regulations or guidelines of the Board of Examiners, or if the competence of the examiner in the area of examinations (creating, invigilating, assessing thereof) repeatedly proves to be of insufficient quality.

## PARAGRAPH 2 – ORGANISATION OF TESTS AND GOOD PROCEDURE

### art. 5 – times of interim examinations

1. Written interim examinations are to be administered at times set by the board of examiners at least 14 days before the start of the term in question.
2. In setting the times of interim examinations, the board of examiners must prevent as far as possible that interim examinations overlap.
3. Changes to times set may be made only in cases of force majeure.
4. If possible, oral interim examinations are to be administered by the examiner(s) in question at a time set after consulting with the student.
5. The times of written resit examinations will be determined and announced at least two weeks in advance. At least five working days will pass between the announcement of the results and the resit examination.

### art. 6 – registration for interim examinations

1. Participation in a written examination is possible only after proper and timely registration through Osiris Student within the university course registration period (see [www.uu.nl/inschrijfperiodes](http://www.uu.nl/inschrijfperiodes)).
2. The board of examiners may allow departure from the period referred to in paragraph 1 if the student demonstrates that he or she is prevented from registering in time by force majeure.

### art. 7 – withdrawal from interim examinations

1. If the student fails to appear at the interim examination at the time for which he or she has registered, or cancels in fewer than ten working days before that time, he or she will be excluded from participation in that interim examination in the current course year.
2. The board of examiners may decide to allow participation nevertheless if the student demonstrates that he or she was prevented from participating in or withdrawing in time from the interim examination by force majeure.

### art. 8 – order during a final or interim examination

1. The examiner (*alternatively: the board of examiners*) must see to it that an adequate number of invigilators are appointed for the written interim examinations, who see to it that the examination runs properly.
2. The student must identify himself/herself on request by or on behalf of the board of examiners by his or her student card and a valid proof of identity. Admission to the interim examination will be denied if the student is unable to identify himself/herself.
3. The student must follow instructions of the board of examiners, or the examiner or invigilator, which are given before, during and after the interim examination.
4. Should the student fail to follow one or more instructions as referred to in the third paragraph, he or she may be excluded by the board of examiners or examiner from further participation in the interim examination in question. As a consequence of the exclusion, no result will be determined for that interim examination. Before the board of examiners takes a decision, at the student's request, they must give him/her the opportunity to be heard on the matter.
5. The duration of an interim examination must be such that students reasonably have enough time to answer the questions.
6. Latecomers will be admitted to an interim examination 30 minutes at most after the start of the examination. If a student is prevented by force majeure from being present within this time limit, the board of examiners, or examiner, will decide whether he or she can still be admitted to the interim examination.
7. Students may not leave the room where the interim examination is being administered within 30 minutes of the start of the examination.
8. After the participants have left the room, no more latecomers will be admitted to the interim examination.
9. Students must hand over their bags, coats and electronic devices to the invigilators at the start of the interim examination.
10. Students who prove to be in possession of mobile phones or other electronic devices during the interim examination will be excluded from further participation in that interim examination.



## PARAGRAPH 3 – ASSESSMENT OF TESTS, THESIS

**art. 9 – questions and assignments**

1. The board of examiners must see to it that written interim examinations are to be marked on the basis of predetermined, written standards, possibly adjusted on the basis of a correction.
2. If more than one examiner is involved in the marking of an interim examination, the board of examiners must see to it that all examiners mark it on the basis of the same standards.
3. The manner of marking must be such that the student can check how the result of his or her interim examination was reached.
4. The last mark given will apply to the assessment of the result of an interim examination/course.

**art. 10 – assessment of thesis, research assignments, theses**

1. The Board of Examiners will ensure that the assessment criteria for the thesis, research assignments and theses are adopted and that these are included in the course or thesis manual.
2. In practical exercises, if several students contribute to the result of a single project, the board of examiners will use the following guidelines:
  - agreements on the division of tasks among the students who are to perform the work must be set out in writing by the examiner(s) responsible prior to the start of the work;
  - students will be assessed individually on the basis of the work they have performed.
3. A thesis (possibly add master's research etc.) must be marked by two examiners. The classification is to be made by determining the average of the marks given by these examiners. If the examiners' marks differ by more than 2 points, the board of examiners will take a decision on the classification. This decision will be binding on all parties.
4. The examiners will provide insight, using an assessment form, into the way in which the final assessment has been reached.

**art. 11 – subsequent discussion**

1. As soon as possible after the result of an oral interim examination is announced, if a student so requests or on the initiative of the examiner, a subsequent discussion will be held between the examiner and the student, in which the examiner will give reasons for the decision.
2. During a period of 30 days, starting on the day after the results of a written interim examination were announced, the student may request the examiner to hold a discussion. The discussion will be held at a place and time determined by the examiner.
3. If a collective discussion is organized, the student can submit a request as referred to in the second paragraph only if he or she was present at the collective discussion and he or she gives reasons for that request, or if he or she was prevented by force majeure from attending the collective discussion.
4. The provisions of the preceding paragraph will apply *mutatis mutandis* if the examiner offers the student the opportunity to compare his or her answers with model answers.

## PARAGRAPH 4 – ASSURING THE QUALITY OF EXAMINATION

**art. 12 – assuring the quality of testing**

The Board of Examiners will ensure that:

- a. an examinations policy/plan is in place, and that this is implemented
- b. examinations are created in line with the learning aims and final terms of the course in question
- c. uniform agreements are entered into on the way in which examinations are created

**art. 13 – determination of the quality of testing**

1. The testing panel is charged with the provision of analysis and advice in relation to the quality of the examinations. To this end, it will test the quality of individual examinations on the basis of random samples – and following complaints,

evaluation of results, pass rates and suchlike – in relation to the validity (they measure knowledge, skills and competences) and reliability (are they consistent and accurate) and will inform the Board of Examiners of this.

2. The Board of Examiners may grant the testing panel an assignment to provide information, undertake research and make proposals concerning the organisation of the examinations. The testing panel is obliged to perform these assignments. The testing panel is responsible in relation to the performance of these assignments to the Board of Examiners.

**art. 14 – assuring the quality of examinations (final level for the graduates)**

The Board of Examiners will ensure that:

- a. the final qualifications for the course as described in the Education and Examinations Regulations are translated into testable learning aims for each course
- b. there is a systematic investigation of whether there is sufficient connection between the course aims and the final terms, or the sum of the learning aims for each course corresponds to the final qualifications for that course.

**PARAGRAPH 5 – EXEMPTIONS**

**art. 15 – exemption**

1. Students wishing to receive one or more exemptions, must submit a request with grounds to the Board of Examiners. The request must be signed and contain:
  - the student's name, address and student number
  - a description of the grounds on which the exemption is being sought
  - for which course(s) the exemption is being sought
  - an authenticated copy of the student's diploma, examination results or proof of examinations previously taken
  - and/or a description of the knowledge and experience the student has obtained outside of higher education, accompanied by the relevant documents showing this.
2. The Board of Examiners will submit the request for advice to the examiner(s) charged with the teaching of the course(s) for which the exemption is being sought.
3. The Board of Examiners will decide within 6 weeks of the date of receipt of the request on whether the exemption will be granted. Exceptions are the summer vacation period and during the fieldwork period.

## GIMA Additional Teaching and Examination Regulations

GIMA Additional Regulations to the Teaching and Examination Regulations 2013-2014 as determined by the Dean of the Faculty of Geosciences of Utrecht University (= present coordinating institute) on April 24<sup>th</sup>, 2012.

### SECTION 1 – General provisions (additional to TER 2013-2014, Section 1)

#### Art. 1.1 – Applicability of the additional regulations

- In addition to the provisions of art. 1.1 :
  - These additional regulations apply to the teaching and the examinations of the Master programme GIMA: Geographical Information Management and Applications of the Masters degree programme MSc Geographical Sciences.
  - This programme is conducted as a partnership between Utrecht University (UU), Wageningen University (WUR), Delft University of Technology (TUD) and University Twente (UT) .

#### Art. 1.2 – Definition of terms

- In addition to the provisions of art. 1.2, definitions of terms:
  - The GIMA programme board: consists of the formal representation of the four cooperating institutes of higher education referred to in art. 1.1 (WHW).
  - The GIMA programme (executed by a partnership between universities) has an Examination Committee. This Committee is comprised of at least one representative of each participating university who is engaged in teaching within the GIMA programme.
  - The members of the Committee will be appointed by the partners in GIMA according to art. 7.12 of the Dutch Higher Education and Research Act.
  - The members of the Committee will appoint a chairperson from within the group. The present chairperson of the GIMA Examination Committee is mentioned on Blackboard, including address information. Requests to the Committee should always be sent to the chairperson of the Examination Committee through the Programme Director.

### SECTION 2 – Admission (additional to TER 2013-2014, Section 2)

#### Art. 2.1 – Degree programme admission requirements

- In addition to the provisions of art. 2.6 for admission procedure:
  - Final admission decisions for the GIMA programme of study are made by GIMA's Admissions Committee.
  - The Committee is comprised of:
    - The Programme Director, who is also the chair of the Admissions Committee, in principle appointed from among the senior-staff engaged in teaching within the GIMA programme;
    - A member or the GIMA Programme Board;
  - If deemed needed the Admission Committee can consult external experts, within or outside the GIMA programme.
  - The Programme Board of GIMA appoints the Committee members.
- In addition to the provisions of art. 2.4.7, for admission to the programme of study GIMA:
  - A student who does not hold a bachelor's degree, but has successfully completed equivalent academic education with an academic load of 120 ECTS ("84 stp.") may request admission to the GIMA programme. In exceptional cases he/she may be admitted.

#### Art. 2.4 – Admission to the Master's programme

- In addition to the provisions of art. 2.4.7, for admission to the programme of study GIMA:
  - students must have gained basic knowledge of and experience in geo-information and geo-information processing;
  - professional experience in the field of geo-information is highly appreciated;

### Art. 2.6 – Admissions procedures

- In addition to the provisions of art. 2.6 for admission procedure:
  - The Admissions Committee will make an admission decision within 20 working days of the deadlines mentioned in art. 2.6.6.
  - The applicant will receive written notification that he/she has been admitted to the GIMA programme.
  - If an applicant is not admitted, he/she will get a well-reasoned refusal.
  - Applicants can challenge refusal at the Appeal Board of the coordinating institute.

### Art. 2.8 – Limited entry

- In addition to the provisions of art. 2.8 for admission procedure:
  - When there is a maximum for participation in a certain module, this is announced in the course guide. If a module is required at that particular moment of time in a students' study programme, these students are awarded priority.
  - If the number of participants in a module is low, the Programme Director can decide, after consulting the coordinator of the module, to adjust the organization of the module or to depart from the description of the module, given in the course guide. This adjustment of or departure from the regular programme may not influence negatively the intended quality of the programme.

## SECTION 3 – Content and structure of the degree programmes (additional to TER 2013-2014, Section 3)

### Art. 3.1 – Aims of the degree programmes

- In addition to the provisions of art. 3.1.1,
  - The programme aims to:
    - prepare the student for a professional career as an all-round manager of geo-information,
    - prepare the student for a professional career as a specialist in the field of geo-information applications,
- In addition to the provisions of art. 3.1.2:

*The graduate is able to:*

#### DOMAIN SPECIFIC

13. Identify and understand geo-information concepts, methods and techniques.
14. Use appropriate concepts, methods and techniques for the management and application of geo-information.
15. Analyse the quality and usability of geo-information processes.
16. Evaluate solutions for societal problems by applying knowledge of geo-information.
17. Design and implement proof-of-concept geo-information-based solutions for societal problems.

#### SCIENTIFIC

18. Independently formulate and execute research in accordance with academic standards within the field.
19. Communicate clearly (both orally and in writing) with specialists and non-specialists to present and discuss the outcomes of research and design projects.
20. Show awareness of the need to keep in touch with relevant developments within the discipline and is able to recognise, understand and apply new concepts and approaches as they emerge.
21. Demonstrate understanding of the moral and ethical dimensions of scientific research and its applications, and the importance of intellectual integrity.

#### GENERAL LEARNING OUTCOMES

22. Effectively organize, structure and plan phases in multidisciplinary team work.
23. Critically reflect on own performance and results, as well as on those of colleagues.
24. Design and plan a path to study in Geo-Information Science in a manner that is largely self-directed or autonomous.

### Art. 3.5 – Masters programmes; entry points

- In addition to the provisions of art. 3.1.2, the GIMA programme starts on Tuesday in week 36.

### Art. 3.7 – Components taken elsewhere

- Contrary to the provisions of art. 3.7.1, In order to pass the GIMA Masters degree exam the student must complete at least half of the Masters programme through components offered at the four partner institutes (Delft University of Technology, University of Twente, Utrecht University, and Wageningen University).

## SECTION 4 – Courses (additional to TER 2013-2014, Section 4)

### Art. 4.1 –Course

- In addition to the provisions of art. 4.1, course the GIMA programme can also be found on: [www.msc-gima.nl/](http://www.msc-gima.nl/)

The programme of study includes:

- theoretical and methodological modules with an academic load of 40 ECTS , including minimally 18 ECTS of elective components ;
- practical training with an academic load of 20 ECTS ;
- an internship with an academic load of 30 ECTS, or optionally: an internship with an academic load of a minimum of 20 ECTS and an additional, supplementary and relevant university course, whereby the total package must be about 30 ECTS.
- an individual assignment (research or design) with an academic load of 30 ECTS.

## SECTION 5 – Assessment (additional to TER 2013-2014, Section 5)

### Art 5.3 – Assessment of placement or research assignment

- In addition to the provisions of art. 5.3.1,
  - The supervisor in question and at least one another expert assesses an internship assignment. At least one of them should be a staff member in the GIMA-programme of this Masters' degree programme.
- In addition to the provisions of art. 5.3.2,
  - GIMA Masters theses will be assessed by a Thesis Examination Board, consisting of 3 members.

### Art. 5.5 – Repeat exams: supplementary or replacement tests

- In addition to the provisions of art. 5.5, repeat exams: supplementary or replacement tests
  - If the student has completed a module (as described in the course guide), but has not received a satisfactory mark, he/she has the opportunity to take one additional or substitute test at the end of the following module. Any further granting of opportunities to take additional or substitute tests is left to the discretion of the Examination Committee.

### Art. 5.9 – Assessment turnaround time

- In addition to the provisions of art. 5.9.2, assessment turnaround time
  - In case of written testing, the examiner marks the test within 10 working days of the date on which it was administered. In particular circumstances the period of 10 working days may be extended by the Examination Committee to 30 days as a maximum. In this case students should be informed.

### Art. 5.10 –Validity period

- In addition to the provisions of art. 5.10, validity period

- Modules which have been successfully completed have unlimited validity. Contrary to this provision, the Examination Committee may impose an additional or substitute test in respect of a module, which was passed more than four years ago.
- In case of completing a test without completing the entire module the Examination Committee may restrict the validity of the test result to at least one full year (e.g., in case of substantial alteration of the module programme).

### **Art. 5.13 – Exemption**

- In addition to the provisions of art. 5.13, exemption
  - At the student's request, the Examination Committee may, after consulting the examiner in question, grant the student exemption from a programme module if he/she:
    - has completed an equivalent module of a university or higher professional programme of study;
 or
    - has demonstrated through work or professional experience that he/she has sufficient knowledge or skills in relation to that module.
  - Requests for exemptions should be addressed to the chairperson of the GIMA Examination Committee through the Programme Director, approximately one module period in advance (2 till 4 months).

### **Art. 5.15 – Right of appeal**

- In addition to the provisions of art. 5.15, appeal
  - Before making an appeal to the Examinations Appeals Board, GIMA students must first send the appeal to the GIMA Examination Committee and await its reaction.

## **SECTION 6 – Examination (additional to TER 2013-2014, Section 6)**

### **Art. 6.2 – Cum laude designation & Art. 6.4 – Degree certificate**

- In addition to the provisions of art. 6.2 and 6.4:  
the Board of Examiners mandates the GIMA Examination Committee.

### **Art. 6.4 – Degree certificate**

- In addition to the provisions of art. 6.4, degree certificate
  - The degree certificate includes the GIMA certificate signed by the Examination Committee representatives of the four participating universities

## **SECTION 7 – Student support and guidance (additional to TER 2013-2014, Section 7)**

### **Art. 7.1 – Student progress administration**

- In addition to the provisions of art. 7.1.2, student progress administration
  - The module coordinating institute records individual student results. The coordinating institute provides each student on request with a certified copy of the results achieved.

### **Art 7.3 – Disabilities**

- In addition to the provisions of art. 7.3
  - The partner hosting the module will make every effort to accommodate students with functional disabilities in their class work and tests. If necessary, the Examination Committee will obtain expert advice before taking their decision.

- At a student's request, the Examination Committee may give permission for a test to be administered in a manner, which departs from the provisions of the first paragraph.

## **SECTION 8 – Transitional and final provisions (additional to TER 2013-2014, Section 8)**

### **Art. 8.3 – Amendments**

- In addition to the provisions of art. 8.3, amendments
  - In the event of a situation arising that is not covered by these regulations, or when there is a good reason to deviate from these regulations, the final decision rests with the GIMA Programme Board. The Programme Board will lay down amendments to these rules in a separate resolution, after consulting the partners in GIMA.

### **Art. 8.4 – Publication**

- In addition to the provisions of art. 8.4,
  - The Programme Board is responsible for proper publication of these additional regulations, the regulations and guidelines established by the Examination Committee and each amendment to these documents.
  - Any interested party may obtain from the students' helpdesk a copy of the documents referred to in the first section.

### **Art. 8.5 – Effective date**

**These additional regulations take effect on September 1, 2013.**

## **GIMA Additional Examination Regulations to the Regulations of the Board of Examiners**

GIMA Additional Examination Regulations to the Regulations of the Board of Examiners, adopted by the Board of Examiners of the Graduate School of Geosciences at Utrecht University, on December 19<sup>th</sup>, 2011. These Regulations take effect on 1 September 2012.

The Board of Examiners of the Graduate School of Geosciences consists of a Central Board of Examiners and three Executive Chambers. The GIMA Examination Committee is one of the Executive Chambers.

### **PARAGRAPH 2 – ORGANISATION OF TESTS AND GOOD PROCEDURE**

#### **Art. 6 –Registration for interim examinations**

- In addition to the provisions of art. 6  
GIMA students will, if required, register properly and timely for a written examination through the Blackboard module of the module concerned, or by sending an e-mail message to the module coordinator.

### **PARAGRAPH 5 – EXEMPTIONS**

#### **Art. 15 – Exemption**

- In addition to the provisions of art. 15,  
the requests for exemptions for the GIMA programme must be submitted to the chair of the GIMA Examination Committee through the Programme Director.

A student may only be exempted from the internship requirement if the following conditions are met:

- proof can be supplied that the student has a minimum of 3 years work experience in a geo-information environment;
- the student has written a 3000-word essay (in English or Dutch) discussing how the work he or she did in the geo-information environment is related to the GIMA modules;
- the student has handed in a portfolio of the projects in which he or she was involved when working in a geo-information environment;
- the student has submitted a written request for exemption to the GIMA Examination Committee.

All documents relating to the points above must be submitted to the GIMA Examination Committee through the GIMA Programme Director.

In the event of a situation arising that is not covered by these internship regulations, or if there is good reason to deviate from these regulations, a written request must be submitted to the GIMA Examination Committee. The final decision rests with this GIMA Examination Committee.



